VOLUME V OF V

THE STATE OF SOUTH CAROLINA
In the Supreme Court

APPEAL FROM RICHLAND COUNTY
Court of Common Pleas

R. Scott Sprouse, Circuit Court Judge

Appellate Case No. 2019-000839

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S.C. SUPREME COURT

Chris A. Liverman, Petitioner,

v.

State of South Carolina, Respondent

APPENDIX

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transcript?
A Okay.
Q And at line 11, do you see where the judge is speaking?
A I'm sorry, page 112?
Q Page 112, line 11.
A I have that as Maxwell Schardt's opening.
Q The August transcript, my apologies. If you go back to line 12 of the argument, I apologize.
A Okay.
Q Would you agree with me that the judge at that point stated, "I know one other issue dealt with the State wishing to require that the defendant to demonstrate or expose tattoos. I did not hear any arguments on that yesterday, and I know that the State handed up a few cases on that. Ms. Franklin, I will hear any objection that you wish to have on that."
A Okay.
Q And did you, in fact, make an objection?
A It appears so.
Q Okay. And would you read your objection beginning at line 17 going over to page 114 at line 15 into the record?
A Ms. Franklin, "Yes, Your Honor. May it please the Court? After reviewing the case law that Ms. Fent provided to us yesterday and after doing a little bit of research ourselves, Your Honor, we are going to agree that the tattoo

would be non-testimonial. We also agree that Chris Liverman cannot absent himself from the courtroom for purposes of avoiding an identification. We also agree that there must be a foundation, they must lay a foundation before they can admit these tattoos into evidence, and I think, Your Honor, that is the problem here. I think that the State would be able to show that, in fact, it is a tattoo. I think that they may be able to some degree explain when he may have received these tattoos, but I do not believe that they can attribute a specific meaning to the tattoo. The State cannot show that it purports to represent what I believe it is, a thing that they think that it does represent. I believe that they want to enter this into evidence so that the jury will infer that it presents -- I guess, represents, the death of these two children, but it is not what these tattoos mean. There is a basic review of the literature that is on the Internet that will show you that this is a symbol that has an evolving meaning" -- some typos. "Certainly there is a NBS (sic) basketball star who also has the same tattoo refers to the death of his younger brother. I think getting into this sort of evidence is character assassination. I think they are trying to testify the jury with this talk of hidden meanings and secret meanings of gang members. We believe that in addition to simply being inaccurate that it is grossly and unduly prejudicial to my

client, and I think it is calculated to inflame their passions. But at the core I don't think that the State will be able to lay any foundation for it. Additionally I think it's irrelevant. There is another concern. This isn't just a regular tattoo, Your Honor, this isn't a tattoo that someone just walks into a tattoo parlor and receives, this is very specifically a prison tattoo. And my concern is that they are trying to bring up testimony regarding these tattoos. There is also going to be improper evidence relating to my client's prior convictions, the fact he was in prison at the time he received this. I believe that is inappropriate and inadmissible, so I believe that allowing any evidence about tattoos, Your Honor, is denying my client's right to a fair trial under the federal and state constitutions, and I think it is an inadmissible back door character propensity evidence. For these reasons I would ask that you exclude any evidence relating to my client's tattoos."

Q And so you didn't cite rules 401 and 402 on relevance but you were making a relevance argument.

A I believe so, that's what I intended.

Q And you didn't cite rule 404, but you were making an improper bad acts or improper presentation of character evidence.

A Correct.

Q And certainly you talked about character evidence through there.

A Yes.

Q And when you were talking about the right to a fair trial under the federal and state constitutions, what were you talking about?

A His right to due process.

Q Now, after you made that objection, the judge gave Ms. Fent an opportunity to respond, didn't she?

A Yes.

Q And I would like for you to read her response from page 114, line 17, through 115 line 21 into the record.

A Okay. So Ms. Fent's response, "Thank you, Your Honor. Basically there are two sets of tattoos we are trying or want to introduce, the tattoos that were on him that night to go to prove that he was a member of this gang. The tattoos do have a specific meaning and we will present the gang expert that can come up and interpret and identify and state the specific meaning. This isn't a secret meaning or a meaning or a hidden meaning, this is information that they have gotten from gang members themselves from interviews, from research, from talking to them themselves about this is specifically what these tattoos mean. The IGD on his hand, which is the insane gangster disciple, has set up the folk nation. The crown, the pitch fork, all of those things are

specifically folk nation tattoos, and the experts will be able to testify to that. The second one is the teardrop under his left eye, filled-in teardrop under his left eye. We are prepared to be able to present testimony that it wasn't there the night when he was arrested, and pending this case he does now have that teardrop tattoo. The gang expert will be able to say specifically what that means. We are also prepared to present -- or not to present that he was in prison when it happened, it wasn't there that night when he shot these two people and it is there now. And the meaning of it is that I killed someone. Basically, I mean, like any other evidence that comes in that the defense can as you try to say that there is another interpretation to it and that it is up to the jury to listen to the experts, to listen to their proposed other explanation and to decide do they believe the experts or not."

Q Okay. And then you asked for an opportunity to respond.

A Yes.

Q And could you read your response in the record from line 115 at 24, through 116 at line 15.

A Ms. Franklin. "I would ask for -- I mean, this is the testimony that they believe they are going illicit. I would ask that we have an in-camera hearing on this specific question before we actually do this in front of the jury so

that you can make a determination of whether or not it is admissible evidence. In addition I would point out that one of their experts who will be testifying as to my understanding from the witness list they provided to me is from the department of corrections, the South Carolina Department of Correction and will be speaking specifically about the tattoos that they took pictures of. Even if they never say prison or never say that he was in there on a prior charge, the fact that they have a South Carolina Department of Corrections person to testify about Chris Liverman's tattoos, I think the jury is clearly going to make a inferential leap that he was serving time."

Q Okay. And then the solicitor's response at line 16 to 21?

A "We would be happy to leave out the fact that they worked for the department of corrections and just say you are a law enforcement officer. The reality of the situation is, I mean, when you are talking about murder that is how these people become, get their expertise and know this information."

Q Okay. Now, going back to line one on page 116, you had asked for an in-camera hearing on the specific questions; is that right?

A Yes.

Q And without reading it all into the record, but at 116

line 22 to 117 line six, the trial judge sort of gives a response to the -- to what is going on here. Specifically I would like for you to look at page 117 line four through six. It says, "We probably need to have a Council hearing before that person testifies just to be sure outside the presence of jury." Do you see that?

A Yes.

Q Now, you've already pointed this out, but this transcript contains a number of typographical errors, doesn't it?

A Yes.

Q And one is council is spelled like counsel as lawyers as opposed to council, as in State vs. Council, c-o-u-n-c-i-l; is that right?

A Yes.

Q Of course, that's a 1999 case.

A Yes.

Q What is a Council hearing?

A A Council hearing is a hearing to determine the admissibility of some particular evidence, generally some scientific evidence or expert testimony.

Q And does Council also refer to another case called Jones?

A Yes.

Q And does Council go into what the Court has to

determine before admitting expert testimony?
A Yes.
Q Does it go into that the Court has a gatekeeping function to determine whether or not expert testimony is reliable?
A Yes, it does.
Q And so we're still -- at this point in our timeline we're still in the August 28th, maybe 29 hearing, which was the false start for the trial; is that right?
A Yes, the pretrial hearing.
Q And ultimately after this, you know, you moved to some discussion and you made the second motion to continue, right?
A I believe that is accurate.
Q And then the case was, in fact, continued.
A Yes.
Q And if you look at page 122, lines five through 13, what was the reason for judge continuing the hearing?
A I remember the reason why we had to continue it was because I believe a juror had sent a letter to the judge asking if there would be police escorts at the end of the day, and it was kind of clear to us that they were terrified. We thought that they had prejudged the case and engaged in some sort of premature deliberations, so we got a continuance.

Q All right. And then we come back in November for the trial; is that right?
A Yes.
Q And in November prior to opening statements, do you recall there being more pretrial discussions?
A I believe that's right.
Q Now, in a Council hearing, can the Court take testimony from experts?
A Yes.
Q And in actually taking the testimony from an expert that is being challenged, can that be useful in determining whether that testimony is reliable or not?
A Yes.
Q And, in fact, we have situations where we have entire categories of expertise that is not recognized as reliable.
A That's accurate.
Q And then we have certain situations where a person might be able to testify as an expert, but certain opinions are not deemed to be reliable and therefore cannot be admitted.
A Yes.
Q Such as recently we've had a lot of cases on the child advocacy center interviews.
A Yes.
Q Okay. So if you could turn to page 12 of the November

transcript, I believe that's going to be tab three of the notebook that you have.

A Okay.

Q And if you go down to line 12, you're beginning to present some pretrial motions; is that correct?

A Yes.

Q And at line 15 through 20, what are you asking for there?

A I wanted a hearing on a motion in limine as to the admissibility of the teardrop tattoos on my client's face.

Q And if you go over to page 13 at lines five through 12, that's still you, or are you arguing again?

A Yes.

Q And do you suggest -- I mean, the experts aren't there, but you suggest that the judge hear expert testimony on that.

A Yes. I believe -- yes.

Q Okay. And at line 13 the judge asked that you go ahead and put arguments on the record; is that correct?

A Yes.

Q And so on page 13 going over to page 14, do you make some arguments?

A I do.

Q Okay. And are they somewhat similar to the arguments that you made before?

A Yes.
Q If you look at page 14, line five, is there a rule that is referenced?
A Rule 403.
Q Okay. And there's not a reference to relevancy or bad character evidence or due process at that point, is there?
A No, there is not.
Q All right. But the hearing that you're asking for with witnesses is a Council hearing.
A And reliability hearing, yes.
Q And a reliability hearing. Okay. And so that argument goes on for a little bit; is that right?
A Yes.
Q Okay. Now, at page 16 I believe the State is arguing; is that right?
A Yes, Ms. Luck Campbell.
Q And they're talking about one of the experts that they name is at line 13, Mr. Eddie O'Cain?
A Yes.
Q Who is he?
A I mean, I know he's their gang expert, I'm trying to remember. Okay. So he's with the department of corrections.
Q Okay. And then at line 19 through 24, what do they argue?

A That he would be qualified as a gang expert. Are you asking for something more specific?

Q Well, if you go a little bit further line 24 --

A That he would testify to what the meaning of the tattoos is.

Q And then specifically there they're talking about the teardrops; is that correct?

A Yes.

Q Now, if you go over to the bottom of page 17.

A Okay.

Q Actually if you go over to page 19 -- there's arguments on page 17, 18 and 19, but if you go over to page 19, if you could read your argument from line two to line 22 into the record, please.

A Ms. Franklin. "Your Honor, in response to that, I would say there needs to be more of a showing of foundation other than that he got it on such and such a day. I mean, they want to attribute certain meanings to tattoos in this case, and the meaning they're trying to attribute goes to the issues in this case as if they want to put an expert on the stand to essentially testify that they believe my client murdered two children. I mean, to a certain extent they're serving the jury function with the nature of this testimony. I think it's critical testimony. I think it's very important testimony. It's not related to some sort of

collateral or minor issue in this case. I mean, it goes to a very central issue. For that reason I would argue there needs to be a proper foundation beyond merely when he got the tattoo. I mean, if they're going to say that it means something specifically I believe that they need to make a showing that it means specifically for Chris Liverman, and I think that that's not where they're going to be able to meet their burden."

Q Okay. And then over on page 20 at line four the judge is talking at that point. And again, the idea of a proffer comes up, and he says, "Because we're not sure exactly when the experts will arrive" -- he says, "What we will do, because we're not sure when the experts will arrive, is just go ahead and make a proffer, Ms. Franklin, of what your understanding is what the experts will testify." And then you mention at line nine that you have an expert too; is that correct?

A Yes, Mr. Robert Walker.

Q Okay. And at line 13 through 22, do you make an argument?

A I do.

Q What was that argument?

A That the tattoo -- that the teardrop tattoo has an evolving meaning and that -- it's an evolving sort of meaning. You can't just say that those tattoos meant that

he was sort of confessing to murder.

Q Okay. And that also goes to sort of the reliability of that specific piece of testimony; is that right?

A Right. So like these days that teardrop tattoo could be the death of a loved one, a family member, it's not necessarily a murder victim.

Q And, in fact, if you flip over to page 21 at lines ten through 11, do you provide the judge with some other options based on what your expert had told you?

A I'm sorry?

Q Twenty-one, lines one through 11.

A Yes. "It's my understanding that the original meaning of the tattoo and why the teardrops is because prison is a very difficult place to live, it's a hard environment, people could not cry. That the tattoo now is going to symbolize grief within an environment where to cry is something that would subject you potentially to some act of violence against you. That's my understanding of the origin of the tattoo and that it's still evolving."

Q And these arguments go back and forth between you and the State for the next several pages; is that correct?

A Yes.

Q And if you go to page 24 the judge begins to make his ruling; is that correct?

A Yes.

Q And at that point he allows it in; is that right?
A Yeah. He essentially says it goes to weight, not admissibility.
Q All right. And on lines 24 and 25 he bases his decision on rule 403; is that correct?
A Well, yes.
Q All right. And so at this point there's not been a proffer of the testimony --
A Right.
Q -- is that right?
A That's correct.
Q So there's no consideration of the liability through a complete Council hearing.
A Correct.
Q There's no ruling at this point on relevance under 401 or 402.
A Correct.
Q And there's no ruling as far as character evidence under 404A or B; is that correct?
A Correct.
Q Now, this trial was a fairly lengthy trial; is that correct?
A Yes.
Q And do you recall how many witnesses testified about -- provided expert opinion so to speak about gangs?

A I do not recall. I think three specifically as to gangs.

Q All right. If I could have you turn to page 901. Actually page 900.

A Okay.

Q And at line 20, does Ms. Campbell call Investigator O'Cain?

A Yes.

Q Edward O'Cain?

A Yes.

Q And he's the gentleman we talked about earlier that worked for the department of corrections.

A Yes.

Q And at this point if you turn over to page 901 at line one through four, you renew your objection; is that correct?

A Yes.

Q And then the Court recognizes that and the testimony begins.

A Yes.

Q Okay. If you go over to page 904.

A Okay.

Q It looks like at this point you're voir diring Investigator O'Cain.

A Yes.

Q And at line six to seven you ask him what sources do

you use in basing your opinions.
A Yes.
Q And he provides an answer. What is that answer at line eight through 11?
A "Information that gets from law enforcement agencies, Internet, interviews with inmates who are coming into the department of corrections and also street investigations.
Q Okay. And so that's kind of a wide variety of things?
A Yes.
Q And was there any testimony that you recall about the reliability of any of those sources?
A I don't think I understand.
Q The reliability of forming an expert opinion based on street investigation for example.
A I imagine I argued that was the problem.
Q If you go over to page 911, and we're not necessarily going to go through all of this testimony, but at that point they brought up the teardrops; is that correct?
A Yes.
Q Okay. And they're discussing some other tattoos, correct?
A Yes.
Q And at the bottom of page 913 at line 25 they're talking about the pitch fork tattoo, right?
A Yes.

Q And then if you go over to line -- let's see, the question at line 24 is that significant in the folk, f-o-l-k, gang, and then he starts talking about the pitch fork tattoo being normal. And then at lines three to six, can you read what he explained there?

A Sure. "The two dots is part of their -- you can read about the dots in their books of knowledge. Depending on the group you're dealing with, it can mean money, murder, money, monopoly as far as the dots go.

Q And depending upon the group, does that give you any concern, that testimony?

A I'm sorry, what?

Q When he says depending upon the group you're dealing with, does that give you any concern?

A I mean, just the fact that it's additional gang testimony, but --

Q "But it might be one thing in one group and another thing in another group."

A Correct.

Q Yeah. But certainly talking about murder in a murder trial, that's prejudicial.

A Yes.

MS. MCCALLISTER: Your Honor, I would just -- he's leading the witness.

MR. GROSS: Your Honor, when I was asking them general

questions they said go to the transcript and so we're taking more time going through the transcript.

THE COURT: Overruled. Go ahead, we need to move along.

MR. GROSS: Thank you.

Q And so down at line 22 and line 24 on that page, do they ask him to offer an opinion at to whether or not Chris is a member of a gang?

A Yes. He is allowed to offer an expert opinion that he was a member of the folk nation.

Q And they go through actually a series of going through all of the tattoos on his body pretty much; is that correct?

A Yes.

Q No, if you get over to page 918.

A Okay.

Q The question -- there's some -- the topic of a set of king strike two comes up; is that right?

A Yes.

Q And they ask, "Is that significant as far as there's a certain thing that you have to do to get set king strike two?" And Investigator O'Cain testifies, "What I'm being told from the streets in interviews to get strike series of that rank you have to have bodies contributed to you."

A Yes.

Q And at that point did you object?

A Yes.
Q And was there a hearing outside of the presence of the jury?
A Yes.
Q And if you could flip over to page 919.
A Yes.
Q At line one through 11 -- or I'm sorry, through 14, can you read your objection into the record?
A Yes. "Your Honor, my understanding is when this officer just got on the stand to say that the two hash marks besides my client's pitch fork tattoo means that he has bodies associated with that, I'm asking for a mistrial at this point, Your Honor. It's a completely outrageous claim, absolutely no support at all. You know, we've had discussions with the solicitor's office about what they were trying to do with these teardrop tattoos, now they're also trying to bring in this other tattoo on the back. It is incredibly inflammatory, it's without any basis that they've been able to provide, and I just don't know that that is a bell that can be un-rung at this point.
Q And Ms. Campbell's response goes back to that being information the expert relied on; is that right:
A Yeah. Well, her argument is that it again sort of goes to the weight, not the admissibility of it, that we were free to kind of argue that it meant something else.

Q And again, the testimony was, "What I'm being told from the streets and interviews," if you go over to 920 at lines five through 17, can you read your argument into the record there?

A Yeah. "Your Honor, in response to that, I mean, he said he heard from the streets, now we're running into hearsay issues, confrontation issues."

Q If you could continue.

A "Until they can bring somebody in here who actually says that that's what the tattoo on my client's back means then I don't have the right to confront my client," I guess that should be the witnesses. "I don't the have right to confront the witness who was putting this into the gang expert's mind. I mean, it's not enough that I have the opportunity to cross examine this particular person, but whoever is making that sort of a claim about my client, my client has the right to have that person in front of him as well."

Q Okay. And then if you go down to line 24, if you could read your argument into the record going over to page 921.

A "But if he's relying on his opinions, Your Honor, I mean, hearsay evidence, again, it invokes confrontation issues. It brings us right back into State v. Price where in that case the testimony ended up resulting in a mistrial because the expert wasn't relying on his own personal

knowledge, but what he was hearing from other people."

Q Okay. And then if you go down to lines ten through 15 on that page, do you also go back to the fact that this is heard from the streets?

A Yes.

Q Okay. And so at this point you've introduced the confrontation clause in the hearsay rules; is that correct?

A Yes.

Q Would that have been advisable to perhaps bring up Council at that point?

A Yes.

Q And certainly Rule 404 on character evidence?

A Yes.

Q And relevance?

A Yes.

Q And this whole line of questioning is something that Judge Johnson didn't consider in his initial 403 analysis because the pitch fork with the slashes was something new.

A Yes, that's correct.

Q Okay. And then ultimately the judge allows this to continue; is that correct?

A Yes.

Q I'm going to try to speed this up a little bit instead of going through all of this. If you can -- we're jumping a little bit further ahead, but the testimony is continuing

with Mr. O'Cain if you go to page 945.
A Okay.
Q An issue comes at line 13 about whether or not their experts were allowed to speak with Mr. Liverman; is that right?
A That's correct.
Q And at that point you moved for a mistrial for the second time during this testimony; is that correct?
A Yeah. I mean, I definitely said I had an objection.
Q All right. And this all is really getting back to the expert's testimony about the meaning of the tattoos.
A Yes.
Q And it also gets back to some of what you had told the judge earlier about different people could have different meanings for the tattoos and the reliability.
A Yes.
Q Okay. Now, they also called -- their next witness was a guy named Walter Mahoney?
A Yes.
Q If you could look at page 953.
A Okay.
Q And he was somebody who works for the Columbia Police Department with their gang task force?
A Yeah, that's correct.
Q And if you look at over at 955, this is direct by Ms.

Campbell at line nine, she is offering him as an expert on gang activity?

A Yes.

Q And your cocounsel interposes the objections again; is that correct?

A Yes.

Q And then he is allowed to testify about these tattoos also, isn't he?

A Yes.

Q If you could look at page 957 at line 23, the question is, "Are you familiar with the term set strike king one and two?"

A Yes.

Q And his answer at line 25, could you read that going on to the next page?

A So his answer is, "From the information we're getting, and that's been from the last couple of years with that situation, as far as the strike king gang bang, here again it means that they've done something or there's a possibility of being bodies on that terminology.

Q And again your cocounsel renews the objection again.

A Yes.

Q And this goes right back into what you had objected to earlier about street interviews; is that correct?

A Yes.

Q Okay. And over on page 961 they're asking about -- on line 19 asking about these hash marks near the tattoo; is that correct?

A Yes.

Q And if you could read his answer from line 25 -- I mean, 22 to 25 in the record.

A Yes. Officer Mahoney says, "That's the hash marks across the striker. The strike mark means possibly -- it could mean a lot of things. It could mean bodies, it could mean other things."

Q All right. And then on the next page, 962, the question by Ms. Campbell is, "And what are some of the other things it could mean as well?" And if you could, read his answer from lines three to seven into the record.

A "It could mean as far as him robbing somebody, as far as him breaking into vehicles or whatever, it could mean a lot of different things. Because, like I said, in South Carolina this is the last couple of years the striker thing has been coming, it's been fairly new."

Q And arguably that goes to reliability, doesn't it?

A Right.

Q And if you go over to page 963, they're showing him State's Exhibit Number 71 at that point, which is the teardrops; is that right?

A Yes.

Q And Ms. Campbell asks at line 13, "What does that show?" And can you read his answer into the record?

A Sure. "The teardrops, the open teardrop could represent a lost soldier or somebody that could be an innocent. The closed teardrop is a body."

Q Okay. And then at 17 she asked about the open teardrop in her expert opinion, and the answer at lines 19 and 20?

A "It could be somebody who lost like one of his fellow soldiers he lost, or it could be" -- do you want me to continue?

Q Yeah. You say, "A fellow soldier, would that be a gang member?"

A "A fellow gang member, yes. A fellow gang member, or it could be some innocent person that might have been taken out by mistake. The closed teardrop is the body. He is a gang member that took somebody out."

Q I'm sorry, I interrupted you. But they're getting into all kinds of things, speculations?

A Yes, rank speculation.

Q Other bad acts?

A Yes.

Q Character evidence?

A Yes.

Q And just sort of as an aside, there was this whole issue that came up again in the gang expert testimony about

what a lick means?
A Yes.
Q In my experience a lick means whatever the prosecutor needs it to mean at the time. Have you had that experience?
A Yes. I've had it -- since this case I've seen it referred to robberies. In this case, though, they were quite clear in arguing that it meant a murder.
Q Okay. Now, when you presented -- you and cocounsel presented Mr. Liverman's case, y'all called a number of witnesses I think the transcript will reflect.
A Yes.
Q And we talked earlier about having to present evidence that Chris was in jail that you would otherwise not have wanted to present. You called a gang expert, didn't you?
A Yes.
Q Would you have wanted to have to put a gang expert on the stand?
A No.
Q All right. And why did you do that in this case?
A We felt, you know -- it was pretty clear from the beginning of the case that the State was going to be relying on this gang affiliation, and I mean that was something that was going to be the front and center of their case and chief, and we felt like we had to have something to address that. It had to go answered.

Q And part of what -- is it fair to say that part of what you were trying to address was the reliability of it?
A Yes.
Q And your expert was somebody name Robert C. Walker?
A Yes.
Q I'm not going to go into a lot of his testimony, but are there ways that experts can assist a defense lawyer other than by providing testimony?
A Yes.
Q And what are those?
A I mean, helping somebody spot issues, helping to prepare cross examination of State witnesses, just sort of a teaching witness in general.
Q All right. And if you had had a full blown Council hearing where you were able to present testimony, could you have presented Mr. Walker as an expert on issues regarding reliability?
A Reliability? Yes.
Q And without going into all of that, was -- is it -- without going through this painstakingly, is it fair to say that part of what you were trying to do with Mr. Walker was undermine the reliability of the State's experts?
A Yes. I mean, I think that's accurate.
Q Now, if you would -- and this may be confusing so if it is tell me and I'll try to rephrase it. But if you had had

a full blown Council hearing where the State presented their expert testimony and you had presented your responses and then you got to argue it, there's several possible outcomes of that hearing, isn't there?

A Yes.

Q And what are those possible outcomes?

A It could have been excluded or it could have been admitted.

Q Could it also have been limited?

A It could have been limited.

Q All right. Now, the expert testimony in this case, one of the things they did was provide some history about gangs in Columbia.

A Yes.

Q And that was sort of general history; is that correct?

A Yes.

Q And they also -- they also provided some testimony, I guess, about history of gangs.

A Yes.

Q Then they provided some specific testimony about whether or not Mr. Liverman was a member of a gang.

A Yes.

Q And then they provided this testimony about specific meanings of the tattoos.

A Yes.

Q And if you had had a full blown Council hearing, could Judge Johnson have analyzed these different categories of evidence as far as reliability?

A Yes, he could have.

Q And would it have been a -- also an opportunity to bring in some of these other rules of evidence as far as what was relevant and what wasn't relevant and the character evidence?

A Yes.

Q Okay. And instead of coming up in front of the jurors, this hearsay confrontation clause issue would have come up in that pretrial hearing.

A That's correct.

Q And so a lot of these rules also could be grounds for excluding the evidence, but they could also be something the judge considers regarding the reliability of the expert testimony.

A Yes, that's accurate.

Q All right. And could you envision a scenario where if the judge had allowed portions of the testimony but limited the breadth of testimony, limited certain categories that the State could not go into, could you envision a scenario where you might not have needed to call an expert?

A Yes.

Q And, of course, your expert also provided some damaging

testimony too, didn't he?
A I recall that's correct after I reviewed his testimony.
Q And the damaging testimony was also in these areas that could be considered unreliable.
A Yes.
Q All right. Now, I want to shift back to the issue about having to call the person from the detention center. That came up in closing argument, I believe; is that right?
A The record will reflect, I just don't recall.
Q Okay. This looks like this is your argument on page 1363. And you explained to the jury, "You may have been wondering in this case why you were putting up some of these officers to show that Chris was incarcerated."
A Yes.
Q Okay. And again, that was something that you had to do because of the way the State presented objectively false evidence.
A Yes.
Q Now, Mr. Giese gave one of the closing arguments; is that right?
A Yes.
Q And if you could look at beginning in line 24 going over to where that paragraph ends on the next page and read that into the record.
MS. MCCALLISTER: I'm sorry, can you say the page

number again?

MR. GROSS: 1372 beginning at line 24 going over to the next page at line three.

A "Who stole the gun? Who stole the gun? Does it matter who stole the gun. The State submits it does not. Months before the shooting. What matters is who had the gun on August 26th, 2004, that is the question, who had the gun that day. Smoke screen."

Q I mean, to be fair, Solicitor Giese has a point there, doesn't he?

A Yes.

Q And it wouldn't have been an issue unless his team had put that into evidence.

A That's correct.

Q Okay. I want to go back to Tyrone Smith for a minute.

A Okay.

Q If you could go to page 775 in the transcript.

A Okay.

Q If you would look at line 14, please.

A Yes.

Q And this is Ms. Fent from the solicitor's office doing the questioning?

A Yes.

Q She asked Mr. Smith, "Do you want to be here today, Tyrone?" And what was his answer?

A "Yes, I do."
Q And then the solicitor asked, "Okay. Why?" And his response?
A Because there ain't no cameras in here.
Q And the solicitor says. "Okay." And then Tyrone says?
A "And for that."
Q She says, "Explain that." And then he continues.
A "Because I want to come and testify for the sister, but he's a brother, but I didn't want to be on TV."
Q And the question at line 23 is, "Okay. Because you're scared?"
A "Yes, ma'am."
Q And his answer is?
A He wants to do it for the family.
Q All right. And that's when she ended her examination; is that correct?
A Yes.
Q And then you began your cross examination.
A Yes.
Q Did you object to that testimony?
A No, I did not.
Q Should you have?
A Yes.
Q Why?
A I mean, I think it's bolstering. It's improper

bolstering of a witness.

Q Can it also be prejudicial for a witness to testify, "I'm scared?"

A I mean, yes. It assumes that there's a reason to be scared, which is that your client is violent, so it's improper character evidence.

Q And, in fact, you had already in August of that year had a situation where the trial had to be continued because of jurors being scared --

A Terrified, yes.

Q -- in light of all the publicity; is that right?

A Yes.

Q If you could turn to page 557.

A 557?

Q 557, yeah.

A Okay.

Q This is in Investigator Gray's testimony?

A Yes.

Q At line seven there's a question, "Based upon your years as an investigator, is it unusual that people don't necessarily want to come forward and help and cooperate?" And his answer at lines ten and 11?

A "It's not unusual, especially in a case like this, where a lot of people are scared, afraid to be involved."

Q And then if you go to page 602, still Investigator

Gray's testimony?
A Yes.
Q What I just asked you about was during the direct, right?
A Yes.
Q And then in your cross at lines one through three this whole idea of being scared comes up again.
A Yes. "You knew that the residents of T.S. Martin were so scared they called the police that night." Answer. "The police were called for that earlier incident, yes, ma'am."
Q I'm going to show you a page -- 319 -- I'm sorry, 1,319 from the transcript at lines three-six, which is in the solicitor's closing argument.
A Yes.
Q Can you read that into the record, please?
A Yes. Ms. Luck Campbell argued, "There's not a single witness or any evidence in this case that points to anyone other than Chris Liverman as being the shooter, the murderer of [redacted] C.D. and [redacted] T.M. ."
Q Did you object to that?
A I did not.
Q Should you have?
A Yeah.
Q Why?
A Because I think it was a remark on his failure -- not

failure, but not putting up that sort of evidence. It's burden shifting. It's putting the burden on Chris Liverman to prove his innocence.

Q I'm going to have you look at State vs. Sweat, 342 South Carolina 2000. If you could just read the headnotes.

A Okay. "Where the solicitor refers to certain evidence as uncontradicted and the defendant is the only person who could contradict that particular evidence, the statement is viewed as a comment on the defendant's failure to testify."

Q And is that something that could have supported an objection at that point?

A Yes, definitely.

Q And it was available at the time, I think?

A It was.

Q I'm sorry, I don't have these pages pulled. But if you could look with me at line -- or page 1304 at lines 15 and 16. They certainly argue about the tattoos, don't they?

A Yes. "They aren't asking you to convict him because he has a tattoo on his face."

Q And if you would read, beginning on 1311 at line 24 and go over to 1312 lines -- through line three?

A "The defense is going to get up here and say that these statements are the result of police misconduct. There is no evidence in this case of any police misconduct. There is evidence they did everything by the book and that's his

signature."
Q Should you have objected to that?
A Yes.
Q Could that be considered vouching for the police?
A Yes.
Q At the end of page 1312 going into 1313, there's argument about the instructions that the judge is going to give regarding eye witness identification?
A Okay.
Q Would it have been helpful to have had Dr. McQuiston's testimony for the jury to consider in connection with that argument?
A Yes.
Q And on 1314 she's talking about Tyrone and going into -- she talks about Tyrone Smith's credibility at lines five and six. Would that be something that could have been considered improper vouching?
A "It's details like that that make Tyrone Smith credible?"
Q Uh-huh.
A I think that's probably not objectionable.
Q Okay. And at page 1320 at lines 14 to 17, they argue "No one is getting up there and intentionally lying." Is there any way for her to know that?
A No.

Q All right. And does that imply that she might have some knowledge that the jurors don't?

A It could.

Q On page 1368 at lines 22 to 25?

A So this is Mr. Giese saying, "They attack law enforcement, didn't they? They attacked my office, didn't they? My office. My job is just to seek justice, by the way. They attacked witness after witness after witness."

Q And 1369 in continuation of that at line ten, is there something that's objectionable there?

A "How many times in her closing statement did the defendant attorney use this word liar? How many times? I lost track. The State does not use that word, we use the truth."

Q Is that objectionable?

A I mean, that certainly is personal, it's very personal. I think there's some law that says you're not supposed to denigrate opposing counsel an cast dispersions.

Q And they were attacking you for suggesting that the State's witnesses were not being truthful.

A Yes.

Q On 1374 of the transcript at lines five through eight, what are they arguing there?

A "Poo (phonetically). The State submits, do you think Poo wanted to be up here? He wouldn't even identify the

defendant, the State submits, he was so scared of him." That's improper.

Q And why is that?

A Because that suggests that the prosecution knew that he should be identifying Liverman.

Q And it also gets back into this whole scaredness?

A Yes.

Q Do you have an opinion as to whether or not the State was trying to intimidate the jurors?

A Well, I think fear was --

MS. MCCALLISTER: Your Honor, I would object to that. There's no way for her to know what the --

THE COURT: I sustain that objection.

Q Do you think it was appropriate for the State to go into all of this testimony and argument about fear?

MS. MCCALLISTER: Your Honor, again, I object to that. That's --

MR. GROSS: Well, that goes to whether or not --

THE COURT: I overrule, that's a proper question.

A I mean, it was very clear to us at the time that this case was tried that there was an effort to bring in all of this gang testimony as a way to shore up a case that was not particularly strong from their perspective. So I do believe that they were using the gang to illicit kind of an emotional response and to help get their case. I just think

that they tried what they could to get their conviction, and I think a lot of improper evidence was admitted in this trial.

Q If I could have you look at page 1392 beginning at line 15 and go through line seven of 1393 and read that into the record.

A I'm sorry, where?

Q I'm sorry, actually start at line ten.

A Okay. She said, "Let him go, didn't she? She said let him go, send him back to the community. Send him back to his family. Send him back to his gang. The State submits when you look at all this, how can you? How can you? A couple of more things and I'm done. We put Officer Mahoney up, ladies and gentlemen, a fine officer. He works with the gangs everyday trying to help, trying to help." That's clearly improper. "He got up here and he testified and he said something that I have to admit I disagree with, he testified. He said, you know, in the Bethel Bishop it is no offense to Officer Mahoney, the Bethel Bishop side and the Colony side of the railroad tracks is folks nation turf. He said everything on the other side of the tracks was blood turf, do you remember that? Ladies and gentlemen, I disagree with that, I disagree to the bottom of my heart, because that's not folk nation turf, that's not blood turf, that's our community turf. We own that land. We raise our

families there. It's not theirs, it's ours. Send him back? No. It's our community, we own it, we live there."

Q Is that objectionable?

A Yes. It appeals to the community sentiment.

Q Sort of a golden rule type argument?

A Yes.

Q A call to decide the evidence -- decide the case based on something other than the elements of the crime?

A Yes.

Q Almost an argument that Chris Liverman is a member of a gang, let's take our community back by sending him to prison?

A Yes.

Q Regardless of whether he is guilty or not guilty?

A That's accurate, yes.

MR. GROSS: Beg the Court's indulgence for a moment.

(Break in proceedings.)

MR. GROSS: After conferring with cocounsel that's all of the questions we have. I don't know if the Court would want to consider a lunch break since --

THE COURT: How many more witnesses do you have?

MR. GROSS: Well, actually we need to probably discuss at this -- can we have just a moment?

(Break in proceedings.)

MR. GROSS: Ms. Franklin-Best is going to be our final

witness.

THE COURT: Okay. Well, let's take our lunch break and then -- because I assume the State will have significant questions for this witness, so let's go ahead and take a lunch break. And ma'am, you're under oath so as you know you can't discuss your testimony while you're at lunch.

(A lunch break was taken.)

THE COURT: Are we ready to resume the Liverman case? We're ready for cross examination? Ms. McCallister?

MS. MCCALLISTER: Thank you, Your Honor.

CROSS EXAMINATION

BY MS. MCCALLISTER:

Q Okay. I believe you testified on direct that you spent the majority of your legal career doing criminal defense, correct?

A Yes, that's correct.

Q And you were working at the public defender's office in Richland County when you were appointed on Mr. Liverman's case.

A Yes.

Q And how long had you been working there?

A Since 2004, since May of 2004, so a year and a half.

Q Okay. And that was not your first job.

A No.

Q Okay. You had previous criminal defense experience

before you came to the public defender's office.

A Yes. About a year's worth of experience up in New York.

Q Okay. Had you tried a murder case before?

A No.

Q Had you worked with expert witnesses before?

A Maybe some forensic experts, competency and that sort of issue. But I don't recall ever calling an expert to testify in a trial.

Q Okay. And your defense, I think you characterized it to Mr. Gross that it was kind of a third party guilt defense and you were pointing the finger at Diego Thompson.

A I mean, you're right. It wasn't sort of a classic third party defense -- or third party guilt kind of defense. We just thought it was -- we essentially kind of attacked the State's case, their investigation. We didn't feel like they had done an adequate investigation such that they could actually prove that Chris Liverman had done this and not Diego Thompson, who we thought was the more probable person to have committed these crimes.

Q So really the defense was just it wasn't him.

A It wasn't him.

Q Okay. And you talk a little bit about the State's case and the evidence that they had. And you said -- I think you characterized it as not overwhelming because there were some

good things in the evidence for the defense, correct?
A That's what we believed, yes.
Q Like the negative gunshot residue.
A The negative GSR. And also some of the implausible statements given by some of the other witnesses. We knew, for example, that Diego Thompson had been carrying that gun that night.
Q And several of the witnesses gave multiple statements that didn't always match up exactly.
A Yes, that is a fair characterization.
Q So you had fuel to work with.
A Yes.
Q And you talked specifically about Tyrone Smith and his identification. You thought that that was one of the State's more probative pieces of evidence, correct?
A Yes.
Q Okay. Did you ever consider consulting with an expert about the eye witness identification?
A I don't recall us ever discussing an expert for that.
Q Okay. Do you remember why you didn't discuss it?
A I do not.
Q But you were here and you heard her testimony today, this morning, correct?
A Yes, I did.
Q And you heard her talk about some of the sort of

factors that can suggest that maybe the identification is not reliable?

A Yes.

Q Okay. And some of those factors would be the lighting conditions, the distance from which the person observed the event. I think she talked about the time frame between like the show-up and the actual proceeding, the actual event, whether there was a gun involved, whether you were kind of a victim or a witness to the event, all of those kinds of things, correct?

A That's right. A lot of those were the Neil v. Biggers factors that she was discussing about.

Q But some of those things that she was discussing, such as the lighting conditions, you know, the degree of familiarity that the witness has with the person that they're identifying, the distance or the angle from which the incident is viewed, you were able to recognize those as issues to attack in your cross examination and in your argument on your own without the help of an expert witness, correct?

A I think that's accurate. What we didn't have is somebody to really explain kind of the scientific basis for how perception happens, how memory is constructed, so yeah. I mean, we went through the Neil v. Biggers factors, but we did not have somebody to really kind of understand to a

jury -- or to explain to a jury some of the science underlying those factors.

Q Okay. But -- so in addition to some of those factors that you were able to point out maybe as weaknesses, there were some things that suggested that Mr. Smith's identification was reliable, correct?

A I don't know that I would say that necessarily. They certainly had what they believed to be evidence tending to prove that Chris Liverman was the person responsible.

Q Okay.

A I mean, otherwise we wouldn't have been there.

Q But Mr. Smith also, he gave the nickname Baby Jesus before he ever saw who the police had detained, correct?

A Well, I think that's right. I think that Tyrone Smith when he saw the person shooting, I think he really believed that was, you know, maybe Chris Liverman. I just -- and then when he saw them later on I think he said that's who I saw. But the issue for us is that you didn't see who you thought you saw.

Q Okay. But your client gave a statement, his final statement that put himself at the scene shooting a gun.

A You know, that statement was pretty interesting because that was a big issue in the case, because he did give a statement. But when you look at that statement it is materially different from what happened that night, you

know, what had been kind of independently corroborated by other facts. So our position then, and continues to be my position, is that that was never really a confession. It was not an admission. I mean, it was a statement that had -- that he gave around the time of this incident but that didn't accurately reflect like what had actually happened that night.

Q Okay. But you do agree with me that his final statement was that he was there on T.S. Martin and he was firing a gun.

A It does say that. But again, we think there are a lot of certain material differences.

Q But by his own admission he was there and he was firing a gun, so it's entirely possible that that is what Tyrone Smith saw.

A I know that's the State's theory of the case.

Q Okay. And actually Mr. Smith wasn't the only one who ID'd Mr. Liverman as the shooter, correct?

A That's correct. Also Diego Thompson, who we believe was more likely the shooter.

Q And I know that that's your position and that's not the State's argument, that he was more likely the shooter, but his testimony was that he was with Mr. Liverman, he was physically right there.

A That's accurate.

Q So that's not really -- I guess it is an eye witness ID but it's not sort of the same kind of situation as Tyrone Smith. He was -- I guess what I'm saying is Mr. Thompson was saying that he was an active participant in what was going on.

A That he was present when it happened, yes.

Q Okay. And Mr. Smith was more like a classic witness who just happened to be in the area at the time something happened.

A I think that's accurate.

Q Okay. You were also asked about the statements during opening talking about how long Mr. Liverman had been in jail.

A Yes.

Q Part of -- and I think -- I know it wasn't you, it was your cocounsel who made those statements, but part of your argument or part of the argument, by you I mean the defense team's argument, was that the State didn't really do a very good investigation in this case, right?

A Yes.

Q That they got their man early and they followed the suspect instead of the evidence, correct?

A Yes.

Q Okay. And he actually -- you kind of tie that into your third party guilt argument at the end, correct? That

it was somebody else and that this is an innocent man who has been sitting there for all of this time.

A Yes, I think that's accurate.

Q Okay. And I think it was clear that at that point anyway you knew probably because of the pretrial motions and rulings that had been made that there was going to be at some point some evidence of gang involvement and some previous issues were going to come in, correct, through the tattoo testimony?

A Well, I mean, we knew from a very early point that they were going to use this gang affiliation as a major component of their case, so we knew that if that's what you're asking. I don't --

Q Okay. In terms of your kind of pretrial investigation, what did y'all do pretrial?

A Oh my goodness. I mean, we conducted interviews, we had kind of a number of team meetings about the case. We, you know, sought out experts in other areas. You know, I think we just kind of worked it up like we -- like you would work up a case like this. We conducted a lot of investigation, you know, talking to people and trying to get information from other people. We had an investigator on the case who helped us identify leads and that sort of thing.

Q To talk to other witnesses who were there that night?

A We attempted to find people who would speak to us about what happened that night.

Q Okay. And you mentioned that you sought out experts in other areas. So you were aware of how to seek out an expert and to obtain expert help on an issue if you felt like you needed it.

A Yes.

Q You also talked on direct about the gun evidence and the evidence that the gun was stolen from someone's car a few months prior.

A Yes.

Q Do you recall in your cross examination of Investigator Gray bringing up the fact that you had asked him to run this gun trace and try to find out who this gun belonged to?

A I believe that's accurate, yes.

Q Is it fair to say that the State then in redirect kind of responded to that line of questioning?

MR. GROSS: Objection, Your Honor. This is -- the question is argumentative and it's speculative and it tries to draw -- imply conclusions that's not in the record.

THE COURT: Ms. McCallister, if you're asking her something that's in the transcript, just point out the specific question that was asked and then you can ask her about it.

Q Let me try to rephrase this then. So you brought up in

your cross examination of Investigator Gray that the gun was at least tangentially involved in some other -- well, I shouldn't say involved in a crime, but that the gun was stolen.

A Yes. It had been stolen from a car in Shandon.

Q Okay. And I think on direct, or the way that it was framed to you on direct, is that the State introduced false evidence of the gun being stolen. What I'm trying to get at is, do you recall whether or --

MR. GROSS: That's a mischaracterization, objection, Your Honor.

THE COURT: I think what Mr. Gross is alluding to is his question to the witness was were they aware that Mr. Diego -- I think it was Diego's hearsay statement is what Mr. Gross was referring to; is that correct?

MR. GROSS: Right. All of the evidence is is that the gun was stolen, Your Honor. And the evidence that everybody knew to be true is that Chris Liverman could not have stolen the gun.

THE COURT: Mr. Thompson's hearsay statement was --

MR. GROSS: His hearsay statement, which was objectively false. It wasn't raising that the gun was stolen or that the State could respond to that, it's whether or not the State is allowed to present false evidence in response to legitimate evidence.

THE COURT: Well, with that enlightenment, rephrase your question.

Q Do you still have a copy of the transcript up there?

A I think so.

Q Okay. May I point you to page 652? Well, I guess the line of questioning really kind of starts on the bottom of 651 and the top of 652.

A I'm sorry, page 652?

Q The bottom of 651 and the top of 652, if you'll just read that. And this is on redirect, correct?

A Yes.

Q So what the State actually elicits is this answer from Investigator Gray. Ms. Fent asked, "Did Diego give a statement about the defendant got this weapon?" Gray says, "Yes, he did." And Ms. Fent, "Okay. And Diego told you the defendant said he stole it a few months before. He said he had stolen the gun, yes." Okay. So the evidence that the State presented is that Mr. Liverman stole the gun, but they did not say he stole the gun from that car in Shandon.

A Just that the gun was stolen.

Q Right. Just that's the gun was stolen, which was not a fact that was in debate.

A No. I mean, but what was significant about that was that if Chris Liverman stole the gun it would have made sense that he had the gun on him on the night that this

happened, and that was false.

Q I understand that. But my point is that the State never says Chris Liverman committed this crime where he broke into the car in Shandon.

MR. GROSS: And I want to have an objection unless the State can now present evidence that this gun was stolen twice instead of once.

THE COURT: That's a question. I overrule the objection.

Q Well, and that's kind of where I'm going. I think that was the argument that was made on direct -- I mean, not on direct, but in the State's closing is it doesn't matter who had that gun in June, it matters whether Mr. Liverman had it on August 24th of 2004.

A But I think it's fair to say that the point of getting that evidence in was to show that Chris Liverman stole the gun. If it wasn't relevant then why the did the State introduce it? They did because they clearly thought it was relevant. So I understand they argued something different in closing but I think that's, you know, a little duplicitous.

Q Okay. And then there was also testimony that there were other guns involved, correct? It wasn't just the gun that was stolen from Shandon.

A Well, just one murder weapon.

Q Right. But there was testimony from, I think, Diego and Mr. Smith that there was more than one gun present at the scene of the shooting.

A I would have to refer to the record, I just really don't recall.

Q But ultimately as a result of all of the evidence that came in about this gun, you were able to definitively prove that Mr. Liverman was not able to have been the one who stole it on that June night, correct?

A Well, and because we introduced the evidence about his incarceration.

Q But you were able to argue that to the jury, that there's no way that he could have done that, correct?

A Yes.

Q Okay. Can you -- can I point you to page 763 of the transcript.

A Okay.

Q Do you see this is Mr. Smith's testimony? Do you see there at the top where he says that he saw Baby Jesus get the rifle from someone and he gave the other person a rifle -- I mean, a revolver?

A I do see that.

Q So there's testimony at least that there was more than one gun present at the shooting.

A Okay.

Q And that someone else handed him the rifle.
A I mean, that's what the transcript reflects.
Q So someone else, not Mr. Liverman, but originally had the rifle, someone else hands the rifle to Mr. Liverman.
A That's what this says, yes.
Q And the issue of gang membership, that was essentially the State's motive in this case, correct?
A Yes.
Q That was the whole explanation for why this happened.
A That's why they argued that evidence was admissible.
Q And really no one offered any other kind of explanation; is that right?
MR. GROSS: Objection, burden shifting.
MS. MCCALLISTER: Let me rephrase that.
THE COURT: Rephrase your question.
Q Based on the record and the witnesses who testified, there was not really any other explanation offered.
A I don't know that the gang membership really offered much of a motive even in this case. I mean, they argued that the people who were living in this neighborhood were bloods and the people who were living in this neighborhood were folk, and there had been kind of like an earlier drive-by, but that was kind of it. You know, nobody offered any evidence to say there's this huge beef going on between these two groups of people and that's why this happened,

which is another reason why I was really very opposed to the introduction of this evidence in the first place, because it doesn't clearly present a motive in my opinion. But that was the argument they you used to get it.

Q But there was testimony from several of the State's witnesses that there were two groups of gang members kind of jawing at each other at least during the day, some time during the day before the shooting happened, correct?

A That there had been a car earlier that day that drove through the T.S. Martin neighborhood where there was some young men who had been throwing up gang signs. Now, nobody ever put Chris Liverman in that car.

Q Okay. And then I believe the victim's brother also testified that a group of -- just prior to the shooting a group -- he saw a group of men and they asked him something about where -- do any slobs live here, which was a reference to bloods, correct?

A I believe that's accurate for the record.

Q Okay. So there was some evidence at least to suggest that this was gang related.

A Yes.

Q And you have talked about this gang expert witness testimony and the tattoo testimony so I will just try to focus on this issue of having this Council hearing that you talked about earlier. Would you say that this expert

witness testimony was scientific testimony?
A I think that they -- was really scientific? No. It does comport with the scientific method. But it is sort of the kind of evidence that we typically have these reliability hearings for.
Q So it's not something that you can run experiments on or have quality control on necessarily in terms of like a standard and a control group thing kind of thing?
A But there should be some other methods, falsifiability for example, confirmation, peer review if you're going to make some of these conclusions. It's not science in the way that Chemistry is science. But I think there's certain scientific principles that can be brought to bear on this particular area of expertise had they chosen to do that.
Q Do you agree with me that this expertise is mostly gathered by these experts from sort of personal knowledge in terms of being an investigator or conducting interviews and information sharing between different law enforcement agencies?
A I do think that's how they get their information.
Q Okay. So are you familiar with State v. Morgan?
A Not off of the top of my head, I'm sure I've read it.
Q Do you recall that prior to 2009 there were sort of different standards for admitting scientific expert witness evidence and non-scientific expert witness evidence?

A Yes.

Q Okay. And would you agree with me that prior to 2009 when you are looking at non-scientific expert witness evidence the case law says that reliability goes to the weight and not the admissibility of the evidence?

A I mean, I don't recall. I mean, I recall that around the time that we were trying this case and anytime whenever we had sort of expert testimony that we wanted to challenge we would have, you know, what are called Council/Jones hearings to have, you know, a judge make some kind of pretrial determination as to the admissibility. That's kind of all I can really recall. And I know that the judge was talking specifically about a Council hearing in this particular case.

Q Okay. But you do agree with me that there were two different standards at one point in time.

A If that's what the case law says, I mean, I would not dispute that. But --

MS. MCCALLISTER: Your Honor, I just would point the State to -- or I'm sorry, I would point the Court to State v. Morgan, which is 326 South Carolina 520, that's a 1997 case. And then State v. White, 382SC265, which was a 2009 case overruling Morgan. But at the time of the trial in 2006 it's the State's contention that the standard in Morgan applied.

Q Okay. So, you made a lot of arguments about this gang testimony and this tattoo testimony in particular at various points throughout trial, pretrial -- well, really the first trial that was continued, then pretrial in the trial that actually went forward in October and November. Throughout the trial you made objections, you made motions for a mistrial. So you fought this tattoo and gang expert testimony at every opportunity that you saw, correct?

A I thought it was very problematic.

Q Okay. And you offered various arguments in terms of why it should be excluded, correct?

A I mean, yes.

Q Okay. And one of your main arguments was the issue of laying a foundation, that the State wasn't going to be able to show specifically what it meant to your client, correct?

A Yes.

Q And then another big argument that you made was a hearsay argument, correct?

A Yes.

Q And I'm assuming you made those arguments because you thought that you were right and those were good arguments, correct?

A Yes.

Q And do you recall -- I think you testified on direct that you had your own expert who also testified, correct?

A Yes.
Q Okay. And you put him up to sort of counter some of the State's expert testimony.
A I mean, that was the goal.
Q Okay. Is it fair to say that all three experts sort of generally agreed that the teardrop tattoos can have multiple meanings and that -- but the most common meaning is some sort of -- someone died, either like a natural death, that a family member died or someone died because I killed him.
A I would have to read the three testimonies in greater detail, I haven't done that. But, I mean, it's my recollection that it generally meant someone who had passed.
Q Okay. It generally meant someone who had passed. And all three of them generally agreed on that, just maybe not the method of passing, correct?
A I think that's correct. I mean, the record will speak for itself, but I think that's an accurate characterization.
Q And your expert testified that these tattoos had different meanings to different people, and the only way to know for sure when they mean to Mr. Liverman is for Mr. Liverman to tell us; is that right?
A I mean, if that's what the record says.
Q But that was kind of your argument all along, correct, that no one can tell you except for him.
A Or just -- I want to be a little careful because he

doesn't have any constitutional obligation to kind of speak and explain that.

Q Yes, I understand what you're saying now. But your argument was kind of the State is not going to be able to establish what they mean to him.

A I think that's right.

Q And your expert testified that that was true.

A I think --

Q That the tattoos have different meanings to different people.

A Yes.

Q There was also, I think, a lot of testimony, a lot of back and forth about the hash marks and what those mean, correct?

A Yes.

Q And I think again, and I don't know if you recall this, but that the three experts all kind of agreed that that was kind of a new thing that they were just starting to see, correct?

A If that's what the record reflects I would not dispute that.

Q And your expert testified that it signified a rank and that he had never heard of them signifying a body, correct?

A If that's what the record reflects, I would not dispute that.

Q Okay. Your expert was also able to testify as to the meaning of what they meant when they said like to do a lick, correct?

A If that's in the record.

Q Okay. So he was able to correct the testimony to do a lick meant a murder, and he testified that it meant to rob someone for money.

A So he offered up sort a competing narrative or competing explanation, but yes.

Q And another kind of part of your argument about the tattoos, the teardrop tattoos specifically, I think, was that those are -- going back to kind of the issue that they have different meanings to different people, that they might just be something that somebody thought looked cool because a celebrity did it kind of thing.

A Well, I did argue that -- again, I felt like we -- I felt like the State was really coming hard at us with this teardrop tattoo and with this idea that it was really like a confession on his face. And so, I mean, to the best of my ability I tried to argue that there was like a NBA star who also had these teardrops, or celebrities. I did the best I could given what I thought was this incredibly unduly prejudicial evidence.

Q And your expert was able to testify and did testify for you that this -- you can't use this as a confession, this is

not proof of anything just because someone has these on their face.

A Again, if that's what the record says. That's why we wanted to offer him was so that this argument by the State would not go unanswered.

Q So he did give you some helpful testimony, correct?

A You know, again, it would have been better if we hadn't had to go down that road at all. But we did get the expert in order to address what the State was putting up.

Q Because you knew it was likely to come in, correct?

A Well, we knew the judge had made a ruling that it was coming in.

Q And so once that happens you have to address it, correct?

A You have to do the best you can.

Q Even if you didn't want it in the first place you make your objections and you had been overruled.

A Yes.

Q You were also asked about the State's closing arguments a couple of times, I think. I think one of the issues you were asked about is this statement that was made that there is not a single witness that says it was anyone other than Chris Liverman, correct?

A That's right.

Q The State has a right to comment on the evidence,

correct --

A Yes.

Q -- in closing arguments?

A Uh-huh.

Q The solicitor did not say the defense didn't put up any evidence or any witnesses.

A I think that's clearly what they intended, there were only two parties in the courtroom.

Q But it's not what they said, correct?

A Well, I think the inference was clear that Chris Liverman -- that they were arguing that Chris Liverman had an obligation to put up some evidence on his own behalf.

Q Do you agree that there was no witness or evidence -- nobody was identified as the shooter other than Mr. Liverman, correct?

A I mean, no. The State did not present any evidence that somebody other than Mr. Liverman was the perpetrator, and they had the burden of proof.

Q Okay. And you were also asked about some statements, I think, on page 1337.

A I'm sorry, did you say 1337?

Q 1337, yes. And I think this is your closing that I'm pointing you to. But you were asked some questions about the solicitor's closing argument, and I believe you testified you felt like there were some statements made that

were bolstering Diego and Chante (phonetically); is that right?

A I don't recall saying that. There definitely was some bolstering statements, but I think it was more bolstering of law enforcement.

Q Okay. Is it fair to say that in your closing statement you talk about State witnesses who lied and you pointed out specific instances that you called lies?

A I think that's accurate.

Q Okay.

A I haven't read the entire statement, but I'm pretty sure I called a number of people liars.

Q Okay. So then if you are characterizing them as liars, the State has the right to characterize them as being truthful, correct, in response to your argument?

A In general, yes. I don't know where specifically you're talking about.

Q Okay. You spent a good deal of time in your case and argument attacking Diego Thompson's credibility, correct?

A I think that's accurate, yes.

Q The statement that came out from Investigator Gray during the State's redirect about Diego that Diego had said Mr. Liverman stole a gun --

A Okay.

Q -- you recall that? We talked about that.

A We just looked at that.
Q That statement was -- that statement further undermines Mr. Thompson's credibility, correct? Because Mr. Liverman was in jail.
A I guess that's true.
Q Okay. And you went on and on about his credibility at length, including the fact that he never named Mr. Liverman until after he had a conversation with his attorney, correct?
A If that's what the record reflects I would not dispute that.

MS. MCCALLISTER: I think that's all of the questions I have.

THE COURT: Any redirect?

MR. GROSS: Yes, sir. I probably will not take very long.

REDIRECT EXAMINATION

BY MR. GROSS:

Q They asked you some questions about Tyrone Smith's identification.
A Yes.
Q And asked you if you had considered an expert witness on identification.
A And we did not.
Q And then they asked you questions about other things

that you did in your investigation which aren't at issue here today, but you did consult some experts in those, correct?

A Yes.

Q Okay. For the record, are you today offering a strategic reason that you did not consider an eye witness identification expert?

A I mean, no. And I think that having an eye witness expert probably would have been incredibly helpful given the issues in the case.

Q And the fact that you considered other experts for other areas of the case should not be considered as a strategic decision that an eye witness identification expert was not appropriate?

A No. I mean, that the identification was flawed was part of our strategy in the case, that somebody else did it. So it's not like we were pursuing some other defense and then this was kind of inconsistent with it. The defense was it wasn't Chris Liverman and an eye witness would have advanced that particular strategy.

Q You mean an eye witness identification expert.

A Yes.

Q And with regard to 26 months between the incident and the trial beginning, is it fair to say that you and cocounsel could have talked about the failures of the

government's investigation during those 26 months without having to point out that Mr. Liverman was in jail?

A I mean, yeah. So again, going back to kind of like the overall strategy in the case, we were trying to kind of keep a lot of this character evidence, whether it was part incarceration, whether it was gang membership, away from the jury. Had there been a way that we had seen at the time to suppress the information about the stolen gun then we would not have needed to bring in what we perceived at the time was being kind of necessary to prove that, in fact, he wasn't the person who stole the gun.

Q And you had a lot of evidence to attack Diego Thompson's credibility without proving that statement was a lie.

A I think he had -- I felt Diego Thompson was a particularly problematic witness for them.

Q And the point about Chris Liverman being in jail, the prejudicial aspect of that doesn't go to whether Diego Thompson is a liar or not, it goes to whether Chris Liverman has a record for something occurring prior to the events that gave rise to these charges.

A That's right. There's a reason why there is a rule that says that evidence is generally inadmissible.

Q Okay. Now, I think you -- turning to gang membership, I think you addressed this earlier during the cross

examination. This was not a situation where Judge Johnson said you were not entitled to a Council hearing, was it?

A No. He suggested that we have one.

Q Right. In fact, he's the first one who used the term Council?

A Yes.

Q Although that matched with the type of hearing that you were asking for.

A Yes.

Q Okay. And I asked you, I think, in passing about State vs. Price and that was discussed a lot in the record -- I mean, a lot in the trial record and I brought it up again this morning; is that right?

A Yes, that's accurate.

Q And State vs. Price obviously, since it was in the record, was available to you and you did use it at the time of trial, right?

A Yes.

Q And, in fact, Price dealt with some of the very techniques of law enforcement that are at issue today, right?

A Yes.

Q And I believe the attorney general asked you about street interviews, or interviewing people and getting information in the course of their police activities, right?

A Yes.

Q And is it fair to say that that Price case found that opinion testimony based on those practices could be inadmissible?

A Yes.

Q And, in fact, the testimony at trial wasn't just about getting things out of inmate interviews or street interviews, they also talked about data bases that were collected around the country, right?

A Yes.

Q And so there certainly was some testimony that was put into the record about using scientific type principles as far as collecting this information; is that right?

A I don't really recall. I knew that they were collecting it and placing it in data bases, I don't know the method by which they were getting that information.

Q All right. And you haven't read the Morgan case, at least not recently.

A Not recently.

Q And so you don't know whether or not the issue that was involved in that case might be characterized as admissibility of social science testimony in the context of a child abuse case.

A I do not have that knowledge.

Q And they asked about the closing argument, burden

shifting closing argument where they didn't specifically say that Chris Liverman didn't testify, but that was the implication.

A Yes.

Q If I could have you look at the Sweat case again, those two paragraphs in particular.

A Okay. So this is from the Sweat case or the Sweat case, 342 South Carolina 342348. So "The prosecutorial comment, whether direct or indirect, on the defendant's failure to testify is impermissible. Where the solicitor refers to certain evidence as uncontradicted and the defendant is the only person who could contradict that particular evidence, the statement is viewed as a comment on the defendant's failure to testify".

Q And so it doesn't have to be a direct comment that your client didn't testify.

A That's accurate.

MR. GROSS: Thank you. That's all of the questions I have.

THE COURT: Anything further from this witness?

MS. MCCALLISTER: Your Honor, just very briefly.

RECROSS EXAMINATION

BY MS. MCCALLISTER:

Q That case that you just read from, I believe it says that that's the rule when the defendant is the only one who

could contradict the evidence that's being commented on, correct?

A Yes.

Q So there were plenty of witnesses to this shooting. So Mr. Liverman is not the only person who could say that he wasn't there that night.

A If you could read back what the solicitor's comment was in closing.

Q I believe it was there is not a single --

MR. GROSS: I have the -- I have page 319 if you would like to look at that.

A So the comment was, "There is not a single witness or any evidence in this that points to anyone other than Chris Liverman as being the shooter, the murderer of C.D. [redacted] and T.M. [redacted]." I mean, so I understand your point, not a single witness or any evidence in this case. I still stand by -- I mean, it still strikes me as being an improper remark on -- suggesting that he has some kind of a burden to put up a case.

MS. MCCALLISTER: Okay. I think that's all, Your Honor.

THE COURT: Thank you, ma'am, you can step down.

MR. GROSS: And as we indicated before lunch, with that witness we will rest.

THE COURT: Counsel, any witnesses from the State?

MS. MCCALLISTER: No, Your Honor.

THE COURT: Okay. The applicant has rested, the State is not presenting any evidence, therefore the hearing is at a close. I will allow -- each lawyer can make a brief summation of your position.

MR. GROSS: Can I suggest what we did with you in some other cases where we submit post-trial briefs?

THE COURT: Yes, sir, that will be a good idea. There's a lot of material for me to review in this case and I would appreciate each attorney outlining your positions and anything you would like for me to consider either factually or case law.

MS. MCCALLISTER: Sure.

MR. GROSS: And I think that would be more useful than us -- and I know you have another group waiting. I would like to say that Mr. Phillips and I could have you a brief within 30 days. I also have a backlog of stuff, as I know she does too because she's getting some extensions on one of those other cases that we had that's complicated, so we'll offer to do ours in 30 days but we made need to come to you for additional time.

THE COURT: I'll set it at 30 days and if a problem arises either party can ask the Court for an extension.

MR. GROSS: Thank you, Your Honor.

THE COURT: I want to thank counsel on both sides for

your well prepared arguments today.

MR. GROSS: Do you want us to do briefs simultaneously or us do one and them respond?

THE COURT: We'll do it simultaneously, and make sure that each side sends the other side a copy.

(End of the hearing.)

I, the undersigned, Michael C. Watkins, Official Court Reporter for the Sixth Judicial Circuit of the State of South Carolina, do hereby certify that the foregoing is a true, accurate and complete transcript of the proceedings had and evidence introduced in the trial of the captioned case relative to appeal in the Court of Common Pleas for Richland County, South Carolina, on the 17th day of December, 2018.

I do further certify that I am neither of kin, counsel, nor interest to any party hereto.

October 4, 2019

Michael C. Watkins

Court Reporter



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EDUCATION

Ph.D.	Experimental Psychology, University of Texas at El Paso (2003)
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PROFESSIONAL EXPERIENCE

2013 –	Associate Professor, Department of Psychology Wofford College
2012 – 2013	Graduate Program Director, New College of Interdisciplinary Arts & Sciences Arizona State University
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2009 – 2010	Graduate Program Director, New College of Interdisciplinary Arts & Sciences Arizona State University
2009 – 2013	Associate Professor, School of Social & Behavioral Sciences Arizona State University
2004	Visiting Research Scholar, Face Perception Laboratory University of Stirling, Scotland
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[Note: * indicates graduate student authors, ** indicates undergraduate student authors]

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*Altman, C. M., Schreiber Compo, N., **McQuiston, D.**, Hagsand, A., Gonzalez, R., Cervera, J., & Saint-Flour, O. (2016, March). *How much is too much? The effects of real-world intoxication levels on eyewitness identifications.* Paper presented at the annual meeting of the American Psychology- Law Society, Atlanta, GA.

*Altman, C., Schreiber Compo, N., **McQuiston, D.**, Hagsand, A. Cervera, J., Gonzalez, R., & St. Flour, O. (March, 2016). *Drunk but not blind: The effects of high alcohol doses on eyewitness identification.* Paper presented at the International Forensic Research Institute Symposium, Florida International University.

McQuiston, D., **Gough, T., **Hill, R., **Holland, M., & **Lehmuller, C. (2014, April). *Jurors' judgments about recanted confessions.* Paper presented at the 10th Annual South Carolina Upstate Research Symposium, Spartanburg, SC.

*Burd, K. A. & **McQuiston, D.** (2014, March). *The effects of facility animals in the courtroom on juror decision-making.* Poster presented at the annual American Psychology-Law Society conference, New Orleans, LA.

*Shaffer, S., *Havener, S., **McQuiston, D.**, & Sperling, C. (2013, March). *Analysis of interrogations and confessions in alleged shaken baby syndrome cases.* Paper presented at the meetings of the American Psychology-Law Society, Portland, OR.

*Burd, K. & **McQuiston, D.** (2013, February). *Judges' evaluation of evidence when considering post-conviction relief.* Paper presented at the 65th Annual Meeting of the American Academy of Forensic Sciences, Washington, D.C.

McQuiston, D., **Morris, E., & **Graffious, D. (2013, January). *Jurors and new media: Implications for courtroom decisions.* Poster presented at the 14th Annual Meeting of the Society for Personality and Social Psychology. New Orleans, LA.

*Burd, K., **McQuiston, D.**, & *Arthurs, S. (2013, January). *Evidence ranking affects jurors' judgments about DNA and eyewitness evidence.* Poster presented at the 14th Annual Meeting of the Society for Personality and Social Psychology. New Orleans, LA.

Findley, K., Sperling, S., & **McQuiston, D.**, *Shaffer, S., & *Havener, S. (2012, October). *What role should confessions play in the diagnosis of abusive head trauma?* Paper presented at the Twelfth International Conference on Shaken Baby Syndrome/Abusive Head Trauma, Boston, MA.

Perez, L. & **McQuiston, D. (2012, April). *How jurors judge the reliability of eyewitness versus DNA evidence in a criminal trial.* Paper presented the meetings of the Western Psychological Association, San Francisco, CA.

*Arthurs, S. & **McQuiston, D.** (2012, April). *How the expression of DNA evidence affects jurors' interpretation of probabilistic fingerprint evidence.* Paper presented at the meetings of the Western Psychological Association, San Francisco, CA.

Sporer, S., *Davids, M., Kaminski, K. & **McQuiston, D.** (2012, March). *Re-reading brings your memory back: The end of verbal overshadowing?* Paper presented at the meetings of the American Psychology-Law Society, San Juan, Puerto Rico.

Jules, S. J. & **McQuiston, D. (2011, March). *Speech style and occupational status affect assessments of eyewitness testimony.* Poster presented at the meetings of the American Psychology-Law Society, Miami, FL.

McQuiston, D. (2010, August). *Jurors' judgments about forensic identification science.* Paper presented in the *Experimental Psychology in the Courtroom* Symposium at the meetings of the American Psychological Association, San Diego, CA.

McQuiston, D. (2010, March). *Forensic science in the courts: The National Academy of Sciences report and beyond.* Symposium presented at the meetings of the American Psychology-Law Society, Vancouver, Canada.

*Lovis-McMahon, D., *Tingen, I., & **McQuiston, D.** (2010, March). *Jurors' interpretation of DNA and confession evidence through a third verdict option.* Paper presented in the *Forensic science in the courts: The National Academy of Sciences report and beyond* Symposium at the meetings of the American Psychology-Law Society, Vancouver, Canada.

Jin, H. & **McQuiston, D. (2010, March). *It was your fault! How jurors blame assault victims in the sex industry.* Poster presented at the meeting of the American Psychology-Law Society, Vancouver, Canada.

McQuiston, D., **Jules, S., Douglass, A., & **Garcia, J. (2010, March). *Can an emotional courtroom audience enhance jurors' evaluation of evidence strength?* Poster presented at the meetings of the American Psychology-Law Society, Vancouver, Canada.

McQuiston, D., **Jules, S., **Lowman, T., & **Roethele, C. (2009, April). *The impact of audience in the courtroom on mock jurors' judgments.* Poster presented at the meetings of the Western Psychological Association, Portland, OR.

McQuiston, D., **Anderson, H., **Bartholomew, M., & **Valenti, R. (2009, March). *Jurors' beliefs about recanted confessions.* Paper presented at the meetings of the American Psychology-Law Society, San Antonio, TX.

Sporer, S., *Davids, M., & **McQuiston, D.** (2009, March). *The verbal facilitation effect: Person descriptions as a means to improve identification performance.* Paper presented at the meetings of the American Psychology-Law Society, San Antonio, TX.

Papp, K., **McQuiston, D., & **Jin, H. (2009, March). *Assessing the persuasiveness of DNA evidence in the courtroom.* Poster presented at the meetings of the American Psychology-Law Society, San Antonio, TX.

McQuiston, D., **Papp, K., & Saks, M. (2008, March). *Jurors' assessment of the scientific limitations of forensic identification science.* Paper presented at the meetings of the American Psychology-Law Society, Jacksonville, FL.

Malpass, R. S., Tredoux, C. G., Schreiber, N., **McQuiston, D.**, MacLin, O. H., Zimmerman, L. A., & *Topp, L. D. (2008, March). *Study space analysis: A new method for describing and evaluating research literatures.* Paper presented at the meetings of the American Psychology-Law Society, Jacksonville, FL.

McQuiston, D., Saks, M. J., **Papp, K. & **Buttrum, K. (2007, July). *Factfinders' interpretation of scientific data: Subjective estimates vs. objective probabilities.* Poster presented at the meetings of the Society for Research in Memory and Cognition, Lewiston, ME.

Malpass, R. S., Tredoux, C. G., & **McQuiston, D.** (2007, March). *The past gives cues to the future of eyewitness identification research.* Presented in R. Malpass (Chair), Programmatic ideas for the second century of eyewitness identification research. Symposium presented at the 'Off The Witness Stand: Using Psychology in the Practice of Justice' Conference, John Jay College of Criminal Justice, New York, NY.

McQuiston, D., **Horgan, A., **Erickson, G., Saks, M, & **Montgomery, D. (2006, March). *Forensic expert testimony: How presentation affects jurors' evaluations of the evidence.* Presented in S. Sommers (Chair), Extra-legal factors influencing juror decision-making. Symposium presented at the meetings of the American Psychology-Law Society, St. Petersburg, FL.

Burkhardt, S., **McQuiston, D., Bradfield, A., **Bartholomew, M., & **Kyrimis, D. (2006, March). *Evaluation of facial composite evidence depends on the presence of other case evidence.* Paper presented at the meetings of the American Psychology-Law Society, St. Petersburg, FL.

Malpass, R.S., Tredoux, C.G., **McQuiston, D.E**, Zimmerman, L.A. & MacLin, O.H. (2006, March). *A re-examination of sequential lineup superiority.* Paper presented at the meetings of the American Psychology-Law Society, St. Petersburg, FL.

*Topp, L.D., **McQuiston, D.**, & Malpass, R.S. (2006, March). *Examining the effects of facial composite production and repeated viewing on identification accuracy.* Paper presented at the meetings of the American Psychology-Law Society Conference, St. Petersburg, FL.

*Schweitzer, N., **Connolly, B., **Erickson, G., **Horgan, A., **Shaaban, N., **McQuiston, D.**, & Saks, M. (2005, November). *The cognitive science of forensic expert testimony.* Poster presented at the Sackler Colloquium of the National Academy of Sciences, Washington, DC.

Erickson, G., **McQuiston, D., **Horgan, A., & **Burkhardt, S. (2005, April). *Do eyewitness' age influence perceptions of their incorrect testimony?* Poster presented at the meetings of the Rocky Mountain Psychological Association, Phoenix, AZ.

Bradfield, A., **McQuiston, D.**, **Horgan, A., & **Erickson, G. (2005, March). *Sequential photospread presentation and post-identification feedback.* Poster presented at the meetings of the American Psychology-Law Society, La Jolla, CA.

McQuiston, D., **Kirkland, I., Frowd, C., & Hancock, P. (2005, March). *On improving facial composite accuracy: Exploring interview type and procedural strategies.* Poster presented at the meetings of the American Psychology-Law Society, La Jolla, CA.

*Topp, L., **McQuiston, D.**, & Malpass, R. (2005, March). *Eyewitness' perception of the composite construction task and their ability to identify the culprit.* Poster presented at the meetings of the American Psychology-Law Society, La Jolla, CA.

Frowd, C., **McQuiston, D.**, Ness, H., & Hancock, P. (2004, July). *The process of facial composite production.* Paper presented at the meetings of the European Association of Psychology and Law, Krakow, Poland.

Kirkland, I., **Horgan, A., **Erickson, G. & **McQuiston, D. (2004, April). *The utility of competing technologies in facial composite production.* Poster presented at the meetings of the Western Psychological Association, Phoenix, AZ.

McQuiston, D. E. & *Topp, L. D. (2004, March). *Cross-race face recall: Assessing perceptual expertise in a description and facial composite task.* Paper presented at the meetings of the American Psychology-Law Society, Scottsdale, AZ.

McQuiston, D. E. & Bradfield, A. L. (2004, March). *The perceived reliability of facial composite evidence.* Poster presented at the meetings of the American Psychology-Law Society, Scottsdale, AZ.

McQuiston, D. E. & Tredoux, C. G. (2003, July). *Face composite production by eyewitnesses: New technologies and developments.* Symposium presented at the meetings of the Society for Applied Research in Memory and Cognition, Aberdeen, Scotland.

McQuiston, D. E. & Malpass, R. S. (2003, July). *Investigating the own-race bias in composite production.* In D. McQuiston & C. Tredoux (Chairs), Face composite production by eyewitnesses: New technologies and developments. Symposium presented at the meetings of the Society for Applied Research in Memory and Cognition, Aberdeen, Scotland.

*Topp, L., **McQuiston, D. E.**, & Malpass, R. S. (2003, July). *Exploring composite production and its subsequent effects on eyewitness memory.* Poster presented at the meetings of the European-American Psychology-Law/American Psychology-Law Society, Edinburgh, Scotland.

Malpass, R. S., MacLin, O. H., *Zimmerman, L. A., Tredoux, C. G., & **McQuiston, D. E.** (2003, July). *A study space analysis for policy development: Application to simultaneous vs. sequential lineups.* In R. Malpass (Chair), Simultaneous or sequential lineups? New data, new perspectives, new looks at old questions, and a study space based policy analysis. Symposium presented at the meetings of the European-American Psychology-Law/American Psychology-Law Society, Edinburgh, Scotland.

McQuiston, D. E., *Gaitens, K. E., *Zimmerman, L. A., & Malpass, R. S. (2002, October). *Examining the mockwitness technique for evaluating sequential lineups.* Poster presented at the National Conference on Science and the Law, Miami, FL.

Malpass, R. S., **McQuiston, D. E.**, MacLin, O. H., *Zimmerman, L. A. & *Gaitens, K. E. (2002, October). *The use of quantitative techniques for the evaluation of eyewitness identification lineups: Application to actual cases.* Poster presented at the National Conference on Science and the Law, Miami, FL.

*Zimmerman, L. A., *Gaitens, K. E., **McQuiston, D. E.**, MacLin, O. H. & Malpass, R. S. (2002, October). *Differences in simultaneous and sequential lineups: How multiple lineup variables affect eyewitness identification.* Poster presented at the National Conference on Science and the Law, Miami, FL.

Bradfield, A. L. & **McQuiston, D. E.** (2002, March). *Confidence inflation in eyewitnesses: Do changes in confidence over time affect evaluations of the eyewitness or the defendant?* Poster presented at the meetings of the American Psychology-Law Society, Austin, TX.

*Gaitens, K., *Zimmerman, L., **McQuiston, D. E.**, & Malpass, R. S. (2002, March). *Structural bias in eyewitness lineups: When does the suspect stand out?* Poster presented at the meetings of the American Psychology-Law Society, Austin, TX.

*Wilhelmy, R., **McQuiston, D. E.**, & Bull, R. (2002, March). *The effects of rehearsal on eyewitness identification accuracy in young children.* Paper presented at the meetings of the American Psychology-Law Society, Austin, TX.

MacLin, O. H., **McQuiston, D. E.**, *Kroeger, B., & Malpass, R. S. (2001, June). *A fair comparison of laboratory administered simultaneous and sequential lineups.* Paper presented at the meetings of the Society for Applied Research in Memory and Cognition, Kingston, Ontario, Canada.

Malpass, R. S., MacLin, O. H., **McQuiston, D. E.**, & *Kroeger, B. (2001, June). *Lineup evaluation: Notes from the field.* Paper presented at the meetings of the Society for Applied Research in Memory and Cognition, Kingston, Ontario, Canada.

McQuiston, D. E. & Malpass, R. S. (2001, June). *Eyewitness identifications in criminal cases: An archival study.* Paper presented at the meetings of the Society for Applied Research in Memory and Cognition, Kingston, Ontario, Canada.

McQuiston, D. E., Malpass, R. S., *Kroeger, B., & MacLin, O. H. (2001, June). *The effects of verbal information and lineup instructions on mockwitness' ability to detect structural bias in lineups.* Paper presented at the meetings of the Society for Applied Research in Memory and Cognition, Kingston, Ontario, Canada.

McQuiston, D. E. & Malpass, R. S. (2001, May). *Eyewitness identifications in criminal cases: A view from the field.* Poster presented at the meetings of the Western Psychological Association, Maui, HI.

McQuiston, D. E., **Salinas, R., **Villegas, E., **Garcia, G., & Malpass, R. S. (2001, May). *Utility of the sequential lineup procedure: Exploring generalizability issues.* Poster presented at the meetings of the Western Psychological Association, Maui, HI.

Herrera, V., **McQuiston, D. E., MacLin, O. H., & Malpass, R. S. (2000, April). *Examining the cross race effect using ambiguous race faces.* Poster presented at the meetings of the Western Psychological Association, Portland, OR.

Holguin, S., **McQuiston, D. E., MacLin, O. H., & Malpass, R. S. (2000, April). *Racial classification of racially ambiguous faces.* Poster presented at the meetings of the Western Psychological Association, Portland, OR.

MacLin, O. H., Malpass, R. S., *Honaker, S., & **McQuiston, D. E.** (2000, March). *Another attempt to understand the cross-race effect.* In J. C. Brigham (Chair), What do we know about the own-race bias" in face recognition? Symposium conducted at the meetings of the American Psychology-Law Society, New Orleans, LA.

McQuiston, D. E., & Malpass, R. S. (2000, March). *Use of facial composite systems in U.S. law enforcement agencies.* Poster presented at the meetings of the American Psychology-Law Society, New Orleans, LA.

McQuiston, D. E. & Malpass, R. S. (1999, July). *Estimation of lineup bias from mock witness identifications.* Paper presented at the meetings of the Society for Applied Research in Memory and Cognition, Boulder, CO.

*Corey, D., Malpass, R. S., & **McQuiston, D. E.** (1998, March). *An examination of procedures in eyewitness and mock witness identification.* Paper presented at the meetings of the Academy of Criminal Justice Science, Albuquerque, NM.

Malpass, R. S., *Corey, D., *Parada, M., **Chavez, J., *Bowles, S., & **McQuiston, D. E.** (1998, March). *Reliability of face recognition: Take two.* Paper presented at the meetings of the American Psychology-Law Society, Redondo Beach, CA.

Invited Talks & Colloquia

McQuiston, D. (2018, April). *Comfort animals in the legal system.* Invited colloquium, Department of Psychology, Florida International University, Miami, FL.

McQuiston, D. (2017, September). *An empirical examination of jurors' reactions to facility animals during trial.* Invited presentation for the annual International Courthouse Dogs Conference, Bellevue, WA.

McQuiston, D. & Moore, C. (2016, October). *Facility animals in the courtroom: Implications for due process.* Invited presentation for the Pre-Law Society Speaker Series, Wofford College, Spartanburg, SC.

McQuiston, D. (2016, January). *Communication in the courtroom: What witnesses say and jurors hear.* Invited presentation for the South Carolina Bar Association, Charleston, SC.

McQuiston, D. (2015, July). *Evaluating eyewitness evidence.* Invited presentation for the annual South Carolina Association of Criminal Defense Lawyers meeting, Greenwood, SC.

McQuiston, D. (2015, June). *Police lineups: Composition and administration.* Invited presentation for the Allegheny County Public Defender's Office, Pittsburgh, PA.

McQuiston, D. (2014, October). *The psychology of jury decision making.* Invited presentation for the Pre-Law Society Speaker Series, Wofford College, Spartanburg, SC.

McQuiston, D. (2014, September). *Eyewitness evidence.* Invited presentation for the annual South Carolina Public Defender Association Conference, Myrtle Beach, SC.

McQuiston, D. (2014, April). *How jurors and judges think about forensic identification evidence.* Invited colloquium, Department of Psychology, University of South Carolina, Columbia, SC.

McQuiston, D. (2013, November). *Psychology in the courtroom: Implications for factfinders' decision making.* Invited colloquium, Department of Psychology, University of North Carolina at Asheville, Asheville, NC.

McQuiston, D. (2013, November). *Memory and eyewitness identification.* Invited presentation for the North Carolina Bar Association, Greensboro, NC.

McQuiston, D. (2013, November). *The psychology of jury decision making.* Invited colloquium, Department of Psychology, Wofford College, Spartanburg, SC.

McQuiston, D. (2013, September). *Jury decision making.* Invited presentation for the annual South Carolina Public Defender Association Conference, Myrtle Beach, SC.

McQuiston, D. (2013, April). *Psychology and the law: Applying psychological science to courtroom decision making and expert testimony.* Invited presentation at the Forensic Expert Witness Association annual conference, Scottsdale, AZ.

McQuiston, D. (2012, May). *Eyewitness evidence.* Invited workshop at the Forensic Science Training for Capital Defense Attorneys, sponsored by the National Clearinghouse for Science, Technology and the Law, Las Vegas, NV.

McQuiston, D. (2012, March). *12 Angry Men: What witnesses say and jurors hear.* Invited presentation at the Literature and the Law Conference, Maricopa County Bar Association, Phoenix, AZ.

McQuiston, D. (2011, October). *How jurors judge forensic science evidence.* Invited presentation at the International Association for Identification Conference, Tucson, AZ.

McQuiston, D. (2011, September). *The use of statistics in jury decision making research.* Invited colloquium, Department of Psychology, Bates College, ME.

McQuiston, D. (2011, September). *Forensic science in the courtroom.* Invited colloquium for the Forensic Science Program at Pennsylvania State University, State College, PA.

McQuiston, D. (2010, March). *Jurors' judgments about forensic identification evidence: How NIJ supports research on improving the use of forensic science in the courts.* Invited presentation at the American Psychology-Law Society Conference, Vancouver, BC.

McQuiston, D. (2010, January). *Communicating forensic identification science in the courtroom.* Invited colloquium for the Department of Psychology at Florida International University, Miami, FL.

McQuiston, D. (2008, March). *Communicating forensic science to factfinders.* Invited presentation for the 'Faces of Forensics: Identification and Behavior' Conference, University of California, Hastings College of the Law, San Francisco, CA.

McQuiston, D. (2007, June). *Applying the science of eyewitness identification in the courtroom.* Invited presentation for the 5th Annual Arizona Public Defender Association Conference, Tempe, AZ.

McQuiston, D. (2006, June). *Recent research on the reliability of eyewitness identification.* Invited presentation for the 4th Annual Arizona Public Defender Association Conference, Tempe, AZ.

Saks, M. & **McQuiston, D.** (2006, June). *Forensic Science.* Invited presentation for the Arizona Judicial Conference, Tucson, AZ.

McQuiston, D. (2000, October). *Eyewitness identifications in real crimes: An archival study.* Invited colloquium for the Department of Psychology at the University of Texas at El Paso, El Paso, TX.

McQuiston, D. (1999, February). *Application of the mock witness paradigm using sequentially presented lineups.* Invited colloquium for the Department of Psychology, University of Texas at El Paso, El Paso, TX.

GRANT ACTIVITY

Externally Funded Research

Jurors Judgments About Forensic Identification Evidence (**PI: Dawn McQuiston,** Co-PIs: Jonathan Koehler, Michael Saks). National Institute of Justice. $496,450. 2009-2013.

Filtering Expert Testimony Elements (**PI: Dawn McQuiston**, Co-PI: Michael Saks), awarded by the Project on Scientific Knowledge and Public Policy. $24,842. 2006-2008.

Internally Funded Research

Jurors and Traumatic Trial Testimony, Faculty Summer Research Grant Program, Wofford College. $7,000, 2016-2017.

Factfinders' Use of Forensic Science Expert Testimony, Multi-Disciplinary Grants-In-Aid Program, Arizona State University. $28,941. 2007-2008.

Jurors' Assessment of the Limitations of Forensic Identification Science. Faculty Scholarship, Research and Creative Activities Grant Program, Arizona State University. $5000. 2008.

Jury Deliberation as a Mechanism for Increasing Comprehension of Expert Evidence. Faculty Scholarship, Research and Creative Activities Grant Program, Arizona State University. $5000. 2007.

Factfinders' Understanding of Scientific Evidence. Faculty Scholarship, Research and Creative Activities Grant Program, Arizona State University. $5500. 2006.

Evaluating Juror Perceptions of the Reliability of Facial Composite Evidence. Faculty Scholarship, Research and Creative Activities Grant Program, Arizona State University. $5500. 2005.

Examining the Own-Race Bias in Facial Composite Production. Faculty Scholarship, Research and Creative Activities Grant Program, Arizona State University. $5500. 2004.

EDITORIAL RESPONSIBILITIES

Ad Hoc Journal Reviews: *Applied Cognitive Psychology; Behavioral Science & the Law; Journal of Experimental Psychology: Applied; Journal of Experimental Social Psychology; Justice Quarterly; Law & Human Behavior; Psychology, Crime & Law; Psychological Science; Visual Cognition; Women & Criminal Justice*

Ad Hoc Grant Reviews: National Science Foundation (Law & Social Science Division)

Textbook/Book Proposal Reviews: NYU Press; Prentice Hall; Sage Publications

MENTORING EXPERIENCE

Undergraduate Senior Theses Supervised (Wofford College, 2013-present)

Jurors' Evaluation of Facility Animals as a Function of Adolescent Victims During Trial: A General Population Sample. S. Alexander, A. Gomez, T. Owens, D. Thomas, & M. Ward

Jurors' Evaluation of Facility Animals as a Function of Adolescent Victims During Trial. S. Butler, A. De Lucy, H. Demaurice, H. Strickland, & M. Young

Police use of Composite Art in the U.S. S. Bernstein, F. Lifer, C. Kaiser, & M. Payne

Assessing Innovations for Child Witnesses in the Courtroom. G. Harris, C. Hayton, A. Hidalgo, M. McCullough, & C. Watson

Jurors' Consideration of Mitigating Factors in a Death Penalty Case. K. Moses, J. Avinger, A. Henson, & D. Lombardi

Jurors' Judgments About Recanted Confessions. T. Gough, R. Hill, M. Holland & C. Lehmuller

Masters Theses Chair (Arizona State University, 2010-2013)

Courtroom Technology in the 21st Century. S. Havener

An Exploratory Analysis of Interrogation and Confession In Alleged Cases of Shaken Baby Syndrome. S. Shaffer

The Impact of Social Media on Jurors' Behavior During Trial. E. Morris

Exploring the Bias of Facility Dogs in the Courtroom. K. Burd

How the Expression of DNA Evidence Affects Jurors' Interpretation of Probabilistic Fingerprint Evidence. S. Arthurs

Undergraduate Honors Theses Chair (Arizona State University, 2003-2013)

From Standard Protocol to Virtual Autopsies: The Advancement of Forensic Pathology. J. Fitzgerald

Evaluation of DNA vs. Eyewitness Evidence in the Courtroom. L. Perez

Google Mistrials: Implications of Social and Information Media in the Jury Box. J. Garcia

Juror Bias in the Evaluation of Sex Workers as Victims in Court. H. Jin
The Effect of Speech Style and Occupational Status on an Eyewitness's Credibility. S. Jules
Assessing the Persuasiveness of DNA Evidence in the Courtroom. K. Papp
Jurors' Beliefs About Recanted Confessions. H. Anderson
Justice: Blind to Science? J. Lohne
The Impact of Deliberations on Mock Jurors' Understanding of Statistical Evidence. D. Kyrimis
Varying Temporal Distances between Inconsistent Sources of Information: Increasing Effective Memory Monitoring by Varying Retention Interval Placement. J. Foster
Forensic Expert Testimony: How Target and Frame Affect Mock-Jurors' Decisions. A. Horgan
Evaluation of Facial Composite Evidence Depends on the Presence of Other Evidentiary Factors. S. Burkhardt
Mock-Jurors' Evaluations of Forensic Experts: Assessing the "Hired Gun" Effect. G. Erickson

TEACHING EXPERIENCE

Undergraduate

Introduction to Psychology
Introduction to Psychological Science (Lab Course)
Experimental Psychology (Lab Course)
Introduction to Statistics
Advanced Statistics/Multivariate Analysis
Applied Statistics for Psychology
Social Psychology
Psychology and Law
Psychology of Jury Decision Making
Supervised Research / Individualized Instruction
Honors Thesis
Senior Thesis

Graduate

Psychology and Law
Psychology of Jury Decision Making
Graduate Student Research
Thesis
*Invited Lectures given regularly at Sandra Day O'Connor College of Law, Post-Conviction Clinic, Arizona State University: *Eyewitness and Forensic Evidence in the Courts* (2009-2012)

AWARDS & DISTINCTIONS

Scholar Award, Learning Associates Program, Bates College (2011)
Faculty Achievement Award, Arizona State University (2007)
Outstanding Commitment to Students Award, Arizona State University (2005)
Award for Outstanding Research, University of Texas at El Paso (2001)

DEPARTMENTAL / UNIVERSITY SERVICE

Wofford

Faculty Interviewer, Scholars Day, Wofford College (2018)
Committee Member, TEDxWoffordCollege Curation Team, Wofford College (2017-present)
Faculty Mentor, TEDxWoffordCollege Executive Committee, Wofford College (2017-present)
Faculty Mentor, BALANCE Health & Wellness Club, Wofford College (2017-present)

Committee Member, Humanities Capstone Project, Wofford College (2017)
Faculty Interviewer, Wofford Scholar Nominees, Wofford College (2017)
Committee Member, Academic Integrity Committee, Wofford College (2016-present)
Faculty Director, Psychology Kingdom, Wofford College (2016-present)
Faculty Interviewer, Wofford Scholar Nominees, Wofford College (2016)
Committee Member, Humanities Capstone Project, Wofford College (2016)
Faculty Advisor, Paws for a Cause, Wofford College (2015-present)
Psychology Major Advisor, Wofford College (2015-present)
Pre-Law Faculty Advisor, Wofford College (2015-present)
First Year Academic Advisor, Wofford College (2015-2016, 2017-2018)
General Education Task Group, Wofford College (2015)

ASU

Graduate School Preparation Committee, ASU (2013)
Undergraduate Inquiry and Research Experiences Grant Review Committee, ASU (2012-2013)
Psychology & Law Concentration Planning Committee, ASU (2012)
Promotion & Tenure Committee, Social & Behavioral Sciences Division, ASU (2012)
Pre-Tenure Review Committee, Social & Behavioral Sciences Division, ASU (2012)
Panelist, *Insider Tips on the Graduate Admissions Process*, Hosted by Psi Chi, ASU (2012)
Committee on Forensics Concentration Area, ASU (2010-2013)
Faculty Annual Review Committee, Social & Behavioral Sciences Division, ASU (2010-2011)
Director, Master of Science Degree Program in Psychology, ASU (2009-2010, 2012-2013)
Consultant, Sun Devil Mock Trial Team, ASU (2009-2010)
Panel Moderator, Forensic Science in the 21st Century Conference, ASU (2009)
Chair, Social & Behavioral Sciences Division Research Committee, ASU (2008-2009)
Faculty Co-Advisor, Students Taking Action for Animal Rights, ASU (2008-2013)
Master of Science Degree in Psychology Planning Committee, ASU (2008-2009)
Faculty Search Committee, Social & Behavioral Sciences Division, ASU (2008-2009)
Research Committee, Social & Behavioral Sciences Division, ASU (2006-2008)
Web Committee, New College of Interdisciplinary Arts & Sciences, ASU (2006-2008)
Coordinator, Psychology Research Participant Pool, ASU (2006-2007)
Speaker, *The Real CSI*, ASU (2006)
Faculty Advisor, Animal Welfare Association, ASU (2005-2013)
Standards Committee, New College of Interdisciplinary Arts & Sciences, ASU (2004-2006)
Faculty Search Committee, Social & Behavioral Sciences Division, ASU (2004-2005)
Panelist, Social and Behavioral Sciences Professions, ASU (2004)
Faculty mentor, TRiO Program, ASU (2003-2009)
Panelist, Graduate Studies Discussion Panel, ASU (2003)

UTEP

Webpage Development Committee, Legal Psychology Program, UTEP (2002)
Speaker, Graduate Education Day, UTEP (2000)
Co-Coordinator, Annual Joint UTEP-NMSU Psychology Depts. Conference (2000)
Speaker, Graduate School Seminar, UTEP (2000)
Graduate Student Advisory Committee, UTEP (2000)
Psychology Graduate Student Association, UTEP (1999–2003)
Doctoral Student Association, UTEP (1999–2003)
Coordinator, Legal Psychology Group Colloquia, UTEP (1999–2000)
Elected Student Representative, Psychology Graduate Student Organization, UTEP (1996–1999)

PROFESSIONAL SERVICE

Research Committee, International Courthouse Dogs Foundation (2017-present)
External Reviewer, Promotion & Tenure File (2015, 2017)
American Psychology-Law Society (Div. 41 of APA)
* Undergraduate Paper Award Committee (2014-present)
* Dissertation Awards Committee (2012-2014)
* Grant Proposal Review Committee, Grant-In-Aid Program (2012)
* Mentorship Committee (2009-2012)
* Conference Submission Reviewer (2004-present)
Invited speaker, Psychology Advisement Workshop, Glendale Community College, AZ (2005)
Conference Host Committee, Rocky Mountain Psychological Association (2005)

MEDIA

Radio: KTAR Radio, Phoenix, AZ (June, 2005)
Newspaper: *Spartanburg Herald-Journal,* Spartanburg, SC (October, 2017), *Spartanburg Herald-Journal,* Spartanburg, SC (November, 2016), *The Times & Democrat,* Orangeburg, SC (March, 2015), *New York Times* (May, 2012), *Chicago Daily Herald* (April, 2007), *Associated Press* (June, 2005; August, 2004), *East Valley Tribune*, Phoenix, AZ (June, 2005; April, 2005)
Magazine: *O (Oprah) Magazine* (December, 2003)
Video: Walter Cronkite School of Journalism & Mass Communication, Arizona State University (May, 2013)

PROFESSIONAL AFFILIATIONS

American Psychology-Law Society
Association for Psychological Science
Society for Applied Research in Memory and Cognition



THE INNOCENCE PROJECT'S REPORT TO THE COMMITTEE ON SCIENTIFIC APPROACHES TO UNDERSTANDING AND MAXIMIZING THE VALIDITY AND RELIABILITY OF EYEWITNESS IDENTIFICATION IN LAW ENFORCEMENT AND THE COURTS

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INTRODUCTION

The Innocence Project, founded by Barry C. Scheck and Peter Neufeld in 1992, is a national litigation and public policy organization affiliated with the Cardozo School of Law dedicated to exonerating wrongfully convicted people through DNA testing and reforming the criminal justice system to prevent future miscarriages of justice. Barry C. Scheck and the Innocence Project are pleased to have been invited to participate in the first meeting of the National Academies of Science Committee on Scientific Approaches to Understanding and Maximizing the Validity and Reliability of Eyewitness Identification in Law Enforcement and the Courts: Phase I: Social Sciences (the "Committee") and appreciate the opportunity to present to this distinguished Committee.

The 312 exonerations secured to date through post-conviction DNA testing offer critical lessons for those seeking to improve the reliability of our criminal justice system. In the area of eyewitness misidentification, the leading contributing cause of wrongful convictions, occurring in nearly 75 percent of the DNA exonerations, these lessons are amply supported by more than three decades of robust scientific research. Given the role of eyewitness misidentifications in wrongful convictions, the Innocence Project is extremely grateful to the Laura and John Arnold Foundation for funding the Committee. By convening some of the very best minds in the nation to review the extant social science research and offer recommendations for its application by law enforcement and courts, and to identify areas for further research, the Committee's report will offer the nation a much needed roadmap to improve the collection and use of eyewitness identification evidence by law enforcement and courts while identifying those areas where additional scientific research is necessary. The report holds the promise of ensuring the improved reliability of critical evidence in future criminal investigations and trials, an outcome that will substantially reduce the number of wrongful convictions based on eyewitness misidentification.

The work of the Committee will not only improve the fairness and reliability of our system of investigation and adjudication, it will also contribute to improving public safety. In addition to destroying the lives of the actually innocent and their families, the devastating effects of wrongful convictions spread far and wide, affecting the victims and their families for whom justice is not served; members of law enforcement and the judiciary who unwittingly participate in the conviction of an actually innocent person; the public which loses confidence in law enforcement and the ability of the judicial system to reach a just result, and, often, additional victims of real perpetrators who are able to remain free to commit additional crimes once a person is wrongly convicted for their crimes. Indeed, the work of the Innocence Project speaks directly to this latter danger: in 49 percent of the wrongful convictions proven by post-conviction DNA testing, our work also helped identify the real perpetrators of those crimes. Half of these true offenders are known to have committed a total of 139 additional violent crimes, including 76 rapes and 33 murders, following the arrest of the actually innocent person who was then erroneously prosecuted and convicted. In the 227 cases involving eyewitness misidentification, DNA exonerations led to the identification of real perpetrators in 88 (39 percent) of cases. These real perpetrators were responsible for at least 97 additional crimes (62 rapes, 17 murders, and 18 other violent crimes).

These risks are compounded in the eyewitness context where the crime victim makes a mistaken identification (a feature in 86 percent of the misidentification-based wrongful convictions). In

the Innocence Project's experience, the revelation that the victim has inadvertently contributed to the wrongful conviction of an innocent person through misidentification frequently results in feelings of re-victimization. Victims often do not understand that their misidentification may have been the result of police procedures that created a risk of misidentification, leading to feelings of guilt and shame about their role in the wrongful conviction. Exonerations often lead victims to relive the trauma of the crime that may have occurred years, if not decades, earlier; victims commonly report that they experience a renewed sense of fear and insecurity as they realize that the real perpetrator remains free and some lose faith in the criminal justice system altogether. Jennifer Thompson misidentified Ronald Cotton as the man who raped her in her home; her identification (following the creation of a composite sketch used to identify Mr. Cotton as a suspect) was the sole direct evidence offered against Mr. Cotton at his trial. The jury convicted Mr. Cotton despite the testimony of multiple witnesses who offered a consistent alibi defense, and Mr. Cotton was sentenced to life in prison. Upon his exoneration (and the identification and conviction of the actual perpetrator, who had gone on to commit other crimes), Ms. Thompson was devastated: "The man I was so sure I had never seen before in my life was the man who was inches from my throat, who raped me, who hurt me, who took my spirit away, who robbed me of my soul. And the man I had identified so emphatically on so many occasions was absolutely innocent."[1] "I live with constant anguish that my profound mistake cost him so dearly. I cannot imagine what would have happened had my mistaken identification occurred in a capital case."[2]

The work of the Committee also comes at a critical moment in time. While courts have long recognized the dangers of wrongful conviction based on eyewitness misidentification, in recent years that recognition has been bolstered by judicial acceptance of the robust body of scientific research that has emerged over more than thirty years. In the last two years, the supreme courts of New Jersey and Oregon have issued landmark decisions that reflect each court's serious consideration of the scientific research. Similarly, a study group formed at the direction of the Massachusetts Supreme Judicial Court recently issued a report for that court's review that makes important findings of law and science that reflect a deep understanding of the scientific research. Other stakeholders in the criminal justice system have also responded to this compelling body of research: legislatures in seven states have passed laws that reform, or require the reform of, eyewitness identification procedures in a manner consistent with scientifically supported best police practices be used; countless law enforcement agencies have voluntarily adopted best practices; and organizations like the International Association of Chiefs of Police have endorsed best practices. A report from this distinguished body setting forth findings about what issues the scientific community and criminal justice stakeholders (the judiciary, police, prosecutors, the defense, and legislators) believe have been settled by scientific research,[3] what issues require

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[1] Jennifer Thompson, *I Was Certain, But I Was Wrong*, N. Y. TIMES, Jun. 18, 2000, at 15.

[2] *Id.*

[3] We choose the word "settled" with some care because what is "settled" depends on the stakeholder and the purpose, distinctions we are sure the Committee will be considering in the course of its deliberations and report. For some of the issues and one set of stakeholders, the courts, "settled" could mean probabilistic statements that are "generally accepted as reliable" in the relevant field (the *Frye* test) or are supported by testing and peer reviewed research and publication, are falsifiable with known or potential error rates; and have acceptance in the relevant scientific community (the *Daubert* test) such that juries should take them into consideration in the form of jury instructions, judicial notice, expert testimony, or all three. For police interested in efficiently apprehending the

further study and research, and how that research might best be approached both scientifically and practically, would be of enormous importance to stakeholders seeking to modernize regimes for collecting and evaluating eyewitness identification evidence.

WHAT WE KNOW ABOUT WRONGFUL CONVICTIONS BASED ON EYEWITNESS MISIDENTIFICATION

Of the 312 individuals exonerated through post-conviction DNA testing, 227 were convicted at least in part based on eyewitness misidentification. In fact, in 34 percent of wrongful convictions based on eyewitness misidentification, not just one, but multiple eyewitnesses mistakenly identified an innocent person:

- Luis Diaz, a Florida cook who was married with three children at the time of his arrest, was convicted of a string of sexual assaults and served 25 years in Florida prisons. He was misidentified by ***eight*** witnesses.
- Kirk Bloodsworth, a former United States Marine, was convicted of raping and murdering a little girl in Baltimore County, Maryland based on the mistaken identification of ***five*** eyewitnesses. Prior to his exoneration, Mr. Bloodsworth was sentenced to death.
- Brandon Moon, an Army veteran and college student was released from the Texas prison system in 2005 after serving 17 years for a rape that DNA proved he did not commit. He was misidentified by ***five*** witnesses.
- Dennis Maher, a Massachusetts man, served 19 years for a series of rapes, was misidentified by ***three*** different victims.
- Stephen Phillips, a Texas man, was exonerated of a string of sexual assaults after serving 25 years in prison. In the 11 crimes for which Phillips was wrongfully convicted, there were at least 60 victims. At least ***ten*** of those victims erroneously identified Phillips as the perpetrator.

These multiple mistaken witness cases represent a subset of a larger class of the DNA exonerations that involved eyewitness misidentifications: those that involve multiple types of false or erroneous evidence, including forensic evidence, confession evidence and/or incentivized witness testimony. These multiple error cases make up 54 percent of the first 227 DNA exonerations that involved a mistaken eyewitness. These and other DNA exonerations offer valuable information about trends in eyewitness misidentification cases. Of significant but perhaps unsurprising import is the way in which these characteristics reflect scientific findings regarding the risk factors for misidentification of an innocent suspect.

Procedures Used

guilty with reliable identifications but not having their investigations stymied or fatally undermined by filler picks or, worst of all, false suspect picks, the policy calculus as to what is "settled" or should be a "best practice" may not be the same as the judiciary. Similarly, prosecutors, who tend to evaluate issues from the perspective of what can be successfully used in court to convict defendants they believe are guilty and sustained on appeal and in post-conviction proceedings, the calculus as to when these scientific issues are "settled" may well be different than the courts and police. And certainly defense lawyers, who are primarily concerned with making sure their clients are not convicted by unreliable evidence, will yet have a different perspective.

A full 30 percent of the misidentification exonerations involved the use of a composite sketch. Research has shown that the use of composite sketches increases the risk of misidentification of an innocent suspect because the process of creation can alter the witness's memory and those arrested tend to resemble the sketch rather than the actual perpetrator.[4] More than half (54 percent) of misidentification exonerations involved in-court identifications, a procedure that is inherently suggestive. Often the exoneree was the only person matching the perpetrator's description in the well of the court. This has led some to recommend that in-court identifications be prohibited in some or all cases.[5] Relatedly, 80 percent[6] of the misidentification exonerations involved multiple identification procedures, another risk factor for the misidentification of innocent suspects identified in the research.[7] One-on-one showups – universally recognized by courts to be inherently suggestive – were used in 19 percent of cases, including 4 percent (10 cases) where a single photograph was shown to the witness. Voice identifications were used in 12 percent of cases. Live lineups were used in 37 percent of cases, photographic arrays were used in 54 percent of cases, and mug shot books were used in 7 percent.

Notable Features

Cross-race identifications were made by 41 percent of witnesses in the misidentification-based wrongful convictions. Multiple witnesses misidentified the same innocent person in 34 percent of the cases.

The following features were found to have occurred in the first 190 DNA exonerations involving eyewitness misidentification:

- Witness descriptions that differed significantly from the exoneree's actual appearance occurred in 62 percent of the cases;[8]
- Witnesses in 40 percent of cases were initially unable to make a positive identification of the exoneree;[9]

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[4] *See, e.g.*, Christian A. Meissner *et al.*, "Person Descriptions as Eyewitness Evidence," in The Handbook of Eyewitness Psychology: Memory for People (R.C.L. Lindsay *et al.*, eds., 2007).

[5] The Study Group appointed by the Massachusetts Supreme Judicial Court recommends that "in-court identification . . . not be permitted except, in the judge's discretion, on redirect examination, in rebuttal, or in other circumstances where the defendant challenges the witness's ability to make such identification." SJC Report at 48. *See also* Brandon L. Garrett, Eyewitnesses and Exclusion, 65 Vand. L. Rev. 451, 453 (2012). *See also* SJC Report at 48; *United States v. Greene*, 704, F.3d 298, 306-07 (4th Cir. 2013) (*citing Henderson*; *Smith v. Paderick*, 519 F.2d 70, 75 n. 6 (4th Cir.1975)); *United States v. Archibald*, 734 F.2d 938, 942–43 (2d Cir.1984); *United States v. Emanuele*, 51 F.3d 1123, 1130 (3d Cir.1995).

[6] This number includes cases involving in-court identification procedures; multiple procedures that did not involve in-court identifications were used in 62, or 27 percent, of misidentification wrongful convictions.

[7] *See, e.g.*, Deffenbacher, K., Bornstein, B. & Penrod, S. (2006). Mugshot exposure effects: Retroactive interference, mugshot commitment, source confusion, and unconscious transference. *Law and Human Behavior*, 30, 287-307; Ross, D., Ceci, S., Dunning, D. & Toglia, M. (1994). Unconscious transference and mistaken identity: When a witness misidentifies a familiar but innocent person. *Journal of Applied Psychology*, 79, 918-930; Read, J., Tollestrup, P., Hammersley, R., McFazden, E. & Christensen, A. (1990). The unconscious transference effect: Are innocent bystanders ever misidentified? *Applied Cognitive Psychology*, 4, 3-31.

[8] Brandon L. Garrett, Convicting the Innocent 68-69 (2011).

[9] *Id.* at 67.

- A full 57 percent of witnesses were not initially certain of their identifications, but only 21 percent admitted as much when testifying at trial;[10]
- Suggestive lineups were a factor in 34 percent of cases and 27 percent of cases involved suggestive remarks to witnesses.[11]

These are all features that should have led judges to question the admissibility of the evidence. In each case, the identification evidence was admitted at trial without meaningful consideration.

THE SCIENTIFIC RESEARCH IS ROBUST AND GENERALLY ACCEPTED BY EXPERTS IN THE FIELD

The body of social science research concerning the accuracy of eyewitness identification testimony is robust and reliable. It has been reviewed, replicated, and retested, and is generally accepted in the research community.[12] It has also been tested for external validity, which determines the extent to which a finding can be generalized across different people and settings.[13] As a result, "social scientists, forensic experts, law enforcement agencies, law reform groups, legislatures and courts" can rely upon the research into eyewitness accuracy during legal proceedings regarding eyewitness testimony.[14]

Scientists analyzing the nature of memory have focused on its three discrete stages: (1) the acquisition or encoding stage, when a witness perceives an event and information is thereby entered into the memory system; (2) the retention or storage stage, the period between acquisition and the witness's attempt to recall the information; and (3) the retrieval stage, when the witness attempts to recall the stored information.[15] "This three-stage analysis is central to the concept of human memory," and "[p]sychologists who conduct research in this area try to identify and study the important factors that play a role in each of the three stages."[16] Those psychologists have identified in particular numerous factors that may adversely affect an eyewitness's memory at each stage. At the acquisition stage, memory is subject to both event-specific variables (such as duration of the event or presence of a weapon at the crime scene) and witness-specific variables (such as age or race).[17] At the retention stage, additional factors such as the passage of time or post-event information may contaminate the witness's memory.[18] Because memory is subject to many sources of contamination, researchers have recommended that it be regarded as similar to a fingerprint, hair sample, or other trace evidence from a crime scene.[19]

Building on this body of research regarding the nature of memory generally, scientists have conducted a large number of empirical studies—most using controlled experimental methods—

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[10] *Id.* at 49.
[11] *Id.* at 54-55.
[12] *State v. Henderson*, 27 A.3d 872, 916 (N.J. 2011).
[13] Steven Penrod & Brian Bornstein, "Generalizing Eyewitness Reliability Research," in 2 Handbook of Eyewitness Psychology: Memory for People 532 (R.C.L. Lindsay et al. eds., 2007).
[14] Report of the Special Master at 73; *Henderson*, 27 A.3d at 872.
[15] *See* Elizabeth F. Loftus et al., Eyewitness Testimony: Civil and Criminal § 2-2 13 (5th ed. 2013).
[16] *Id.*
[17] *Id.*
[18] *Id.*
[19] *See, e.g.*, Gary L. Wells, *Eyewitness Identification: Systemic Reforms*, 2006 Wis. L. Rev. 615, 622-23 (2006).

that document the adverse impact of various factors on the accuracy of eyewitness identification. As the New Jersey Supreme Court found in Henderson,

> [T]he science abundantly demonstrates the many vagaries of memory encoding, storage, and retrieval; the malleability of memory; the contaminating effects of extrinsic information; the influence of police interview techniques and identification procedures; and the many other factors that bear on the reliability of eyewitness identifications.[20]

Researchers agree that the accuracy of eyewitness identifications is significantly affected by two types of factors: "estimator variables,"[21] which relate to the eyewitness's direct experience of the event, and "system variables,"[22] which relate to the identification procedures following the event. The nature and effect of these variables has achieved "near perfect scientific consensus,"[23] as demonstrated by surveys of experts in the field of eyewitness identification.[24]

The consensus around this robust research has led to a generally accepted set of police procedure reforms that are designed to make identification procedures more reliable. These reforms include: the double-blind administration of live and photographic line-ups; prophylactic pre-lineup instructions to the eyewitness to deter the eyewitness from feeling compelled to make a selection; ensuring that non-suspect photographs and/or live lineup members (fillers) are selected in part based their *resemblance to the description provided by the eyewitness*—as opposed to just their resemblance to the police suspect; obtaining a statement of confidence, recorded in the eyewitness's own words, articulating the level of confidence he or she has in the identification made prior to the receipt of any feedback; and properly documenting the details of the identification procedure, which is critical to ensuring its evidentiary value.

The widespread support of eyewitness identification reform procedures demonstrates that system participants rightly agree that eyewitness identification procedures should constitute a test of a witness's independent recollection, not a witness's ability to guess which individual is the law enforcement suspect. Even among those who do not espouse the proposed reforms, no one with practical experience in the criminal justice system supports the use of suggestive procedures because suggestion makes it difficult, if not impossible, to know when a witness's identification was based on the witness's recollection or when it was based on clues provided by the identification procedure or its administrator. Thus, from the perspective of law enforcement, suggestive procedures are useless as an investigative tool despite the unsurprising reality that

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[20] *Henderson*, 27 A.3d at 883.

[21] Examples of estimator variables that may have an effect on the accuracy of eyewitness identifications include: stress; witness attention (including weapon focus); exposure duration; environmental viewing conditions (lighting, distance, etc.); witness characteristics (race or age vis-à-vis the perpetrator, intoxication, etc.); perpetrator characteristics (disguise, uniqueness of features).

[22] Examples of system variables include the number and type of identification procedure; if the administrator of the procedure knows who the suspect is and when the witness is viewing the suspect (non-blind) or does not know who the suspect is (blind) or when the witness is viewing the suspect (blinded); the type of instructions provided to the witness prior to the identification procedure; whether any feedback is provided to the witness.

[23] *State v. Guilbert*, 49 A.3d 705, 720-21 and n.9 (2012) (collecting research).

[24] Kassin, S., Tubb, V.A., Hosch, H. & Memon A. (2001). On the 'general acceptance' of eyewitness testimony research: A new survey of experts. *American Psychologist*, 56, 412-413.

they yield a greater number of "hits" (identifications of the police suspect) as compared with non-suggestive procedures.

One proposed reform has been the subject of the most controversy – sequential presentation. Historically, laboratory studies comparing sequential and simultaneous presentation have revealed a loss of some correct culprit identifications under the sequential condition,[25] but a concomitant – and much greater – reduction in incorrect filler picks. A 2011 meta-analysis found that compared to simultaneous lineups, sequential presentation on average reduces accurate culprit identifications by 8 percent and reduces incorrect filler picks by 22 percent.[26] A 2001 meta-analysis of thirty tests (taken from 9 published and 14 unpublished papers) of simultaneous and sequential lineups including 4,145 participants found that the average gap in correct identifications was 15 percent.[27] Based on these findings, a majority of researchers have concluded that the sequential procedure produces a better ratio of accurate culprit picks to incorrect filler selections[28] and is, therefore, more diagnostic of guilt.[29]

Many stakeholders have considered the possibility of the loss of correct culprit identifications using sequential presentation and have nevertheless adopted or recommended the adoption of sequential presentation, in light of its other benefits. *See* Appendix A (Stakeholder Support for Eyewitness Identification Reform and Appendix B (National Eyewitness Identification Statutory Landscape). Other stakeholders, however, have rejected sequential procedures, citing the loss of correct culprit identifications found by the laboratory studies.[30]

In 2006, a well-publicized but scientifically flawed evaluation of the sequential identification procedure conducted in three Illinois jurisdictions, including Chicago, was published.[31] The "Illinois Report" was written not by a scientist, but by the General Counsel to the Chicago Superintendant of Police and concluded that sequential presentation of identification procedures does not work in practice. Despite the later-revealed fundamental scientific flaws with the evaluation, the "Illinois Report" led some stakeholders to reject sequential presentation altogether. Many of these stakeholders were not exposed to the subsequent reports and articles that detailed the Illinois Report's many flaws and instead continue to believe the Report's (flawed) conclusions. The Illinois Report set back the progress of reform in this area and, worse, obscured the consensus that existed and continues to exist around the other reform procedures.

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[25] Some prominent eyewitness researchers attribute this decrease in correct identifications to a reduction in guessing: Meissner, C. A., Tredoux, C. G., Parker, J. F. & MacLin, O. H. (2005). Signal detection theory analysis. *Memory and Cognition, 33*, 783-792.

[26] Steblay, N., Dysart, J. & Wells, G.L. (2011). Seventy-two tests of the sequential lineup superiority effect: A meta-analysis and policy discussion. *Psychology, Public Policy and Law*, 17, 99-139.

[27] Steblay, N., Dysart, J., Fulero, S. & Lindsay, R.C.L. (2001). Eyewitness accuracy rates in sequential and simultaneous lineup presentations: A meta-analytic comparison. *Law and Human Behavior*, 25, 459-473.

[28] Steblay et al, *supra* n. 26; Steblay et al., *supra* n. 27.

[29] Steblay et al, *supra* n. 26; Steblay et al., *supra* n. 27.

[30] For a summary of the policy arguments that tend to arise for and against sequential presentation, *see* Gary L. Wells et al., American Judicature Society, A Test of the Simultaneous vs. Sequential Lineup Methods: An Initial Report of the National Eyewitness Identification Field Studies 1-4 (2011), *available at* http://www.popcenter.org/library/reading/PDFs/lineupmethods.pdf. (Hereinafter, "AJS Study Report.")

[31] Sheri L. Mecklenburg, Illinois State Police, Illinois State Police Report to the Legislature of the State of Illinois: The Illinois Pilot Program on Sequential Double-Blind Identification Procedures (2006), *available at* http://eyewitness.utep.edu/documents/illinoispilotstudyoneyewitnessid.pdf.

After the publication of the Illinois Report, a host of social science researchers and practitioners questioned the report's assertions, assumptions, and methodology, finding that the Report's flaws undercut the reliability and validity of results necessary to draw conclusions about sequential or simultaneous presentation.[32] Most notably, a peer-reviewed report disseminated the findings of a blue ribbon panel, composed of leading social science researchers and including a Nobel Laureate, which concluded that the methodology employed by the Illinois Report evaluators rendered its conclusions unreliable. The blue ribbon panel noted that "[t]he confound [failing to properly isolate the variables] has devastating consequences for assessing the real world implications of this particular study" and that, therefore, "the results do not inform everyday practice in a useful manner."[33] Another scientific analysis of the Illinois Report, which was based on information obtained through a Freedom of Information Act lawsuit, concluded that the Illinois Study's failure to randomly assign lineups to the two conditions (sequential and simultaneous) resulted in a significantly higher number of simultaneous lineups in which the witness knew the culprit or had already previously identified the culprit in an earlier identification task, further underscoring the Report's fundamental unreliability.[34] Given its unreliability, the New Jersey Supreme Court refused to even consider the Illinois Report in rendering its landmark decision on eyewitness identification in *Henderson*.[35]

The Illinois Report can be contrasted with a recent landmark field study issued by the American Judicature Society ("AJS Field Study") and conducted by research scientists, which compared double-blind sequential and double-blind simultaneous presentation of lineups involving suspects and witnesses to actual crimes in four law enforcement agencies (Austin, TX Police Department; Charlotte-Mecklenburg, NC Police Department; Tucson, AZ Police Department; San Diego, CA Police Department).[36] The AJS Field Study found that double-blind sequential presentation produced significantly fewer mistaken identifications than double blind simultaneous presentation *without any reduction in suspect identifications.*[37] The AJS Field Study's data show that the double-blind simultaneous procedure yielded 18.1 percent identifications of known innocent fillers while the double-blind sequential procedure yielded 12.2 percent identification of known innocent fillers. Among those witnesses who attempted to make an identification, the double-blind sequential procedure produced a higher rate of suspect identification (69.1 percent) than did the double-blind simultaneous procedure (58.4 percent). Identification of known innocent fillers by these choosers remained higher for those in the

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[32] *See, e.g.*, Steblay, N. http://web.augsburg.edu/%7Esteblay/ObservationsOnTheIllinoisData.pdf; Wells, G. http://www.psychology.iastate.edu/FACULTY/gwells/Illinois_Project_Wells_comments.pdf; Response from the Wisconsin Attorney General: http://www.doj.state.wi.us/dles/tns/ILRptResponse.pdf. *See also*: Timothy P. O'Toole, *What's the Matter With Illinois? How an Opportunity was Squandered to Conduct an Important Study on Eyewitness Identification Procedures*, CHAMPION, Aug. 2006, at 18.

[33] Schacter, D., Dawes, R., Jacoby, L., Kahneman, D., Lempert, R., Roediger, H. & Rosenthal, R. (2007). Policy forum: Studying eyewitness investigations in the field. *Law and Human Behavior, 32, 3-5.*

[34] Steblay, N. (2010). What we know now: The Evanston Illinois field lineups. *Law and Human Behavior*, 35, 1-12.

[35] *Henderson*, 27 A.3d at 243.

[36] The AJS Field Study results have not yet been published in a peer reviewed journal.

[37] *See* AJS Study Report at 13-14. This finding is supported by a 2001 meta-analysis that combined the scientific results of 23 individual tests and found that when crimes and police procedures are simulated realistically, the difference between *correct* identification rates for sequential and simultaneous identification procedures are small, if nonexistent. Steblay et al., *supra* n. 27.

double-blind simultaneous condition (41.6 percent) as compared with those in the double-blind sequential condition (30.9 percent).

Interestingly, the AJS study allowed witnesses using the sequential double blind format to get a second lap if the witness requested it. This "second lap" practice is generally employed in the field by police entities that use the sequential double blind procedure. Admittedly, the "second lap" allows the witnesses who request it to engage in "relative judgments," but the AJS study suggests permitting the "second lap" upon request may also result in the sequential method obtaining the same number of suspect picks as the simultaneous method.[38] We suggest that laboratory experiments be conducted allowing witnesses a second lap upon request in a double blind sequential condition and compare it to a double blind simultaneous presentation to see if the results are similar to the AJS study.[39]

As the Committee heard during its first meeting, recent research applying Receiver Operating Characteristic (ROC) analysis to sequential and simultaneous presentations of identification procedures has raised questions about the sequential advantage. Eyewitness researchers traditionally approached the issue of determining whether sequential or simultaneous was "diagnostic" of guilt by using a likelihood ratio (correct culprit identifications / incorrect filler selections) as the appropriate way to evaluate the presentation methods. Instead, Wixted and others suggest that discriminability[40] – the degree to which a presentation method can discriminate between memory signals associated with innocent and guilty suspects – is the better tool for evaluating the presentation methods. These researchers have found that using ROC analysis, simultaneous does a better job at discriminating between memory signals for innocent and guilty suspects.

The Innocence Project welcomes research using ROC analysis because it is a modeling tool whose utility has been validated to compare the relative diagnostic value of one medical test to another and the investigators attempting to apply it to help resolve issues in eyewitness identification research are respected scientists. Based on our discussions with other scientists, however, we have some questions about the transfer of ROC analysis from medical applications to the study of eyewitness identifications that we are attaching as Appendix C (Questions About the Application of ROC Analysis to Eyewitness Research).

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[38] Phase 2 of the AJS Study, being conducted by Dr. Karen Amendola of the Police Foundation, is attempting to measure the evidentiary strength of the suspect picks from the sequential and simultaneous presentations using measures developed by criminal justice stakeholders in the area (judges, prosecutors, defense attorneys, police) and blindly assessed by independent committees composed of those stakeholders. The actual dispositions of the cases are being tracked as well, but it is believed that stakeholder assessments of evidence strength (assessments the system relies on every day in the plea bargaining process) in suspect pick cases is a more reliable indicator than dispositions which are often a function of factors extraneous to evidence strength – witnesses disappearing, package deal plea bargaining, or quality of the attorneys involved.

[39] The value of conducting a "second lap" permitted study comparing sequential and simultaneous presentations is that one knows for certain whether the culprit was present or not in the lineup, something that is impossible to know for certain in field studies. Phase 2 of the AJS study is designed address this "ground truth" problem by getting independent assessments of the strength of the evidence in the AJS field study cases from criminal justice stakeholders (groups of judges, prosecutors, defense lawyers, and police) to see if there is any difference in the strength of the evidence when a suspect is picked using the sequential or simultaneous methods.

[40] Gronlund, S., Wixted, J., and Mickes, L. (2014, in press). Evaluating eyewitness identification procedures using ROC analysis. *Current Directions is Psychological Science*, 4.

One key question is whether one can assume the eyewitness viewing a lineup can be safely compared to a trained expert viewing the results of a diagnostic test. Simply put, ROC analysis views the radiologist's diagnosis regarding the presence or absence of a malignant tumor in a mammogram as analogous to the witness's decision regarding whether or not a perpetrator is in a lineup. But, the radiologist is an experienced technician who is trained to recognize precise diagnostic characteristics of a stimulus. This single stimulus (tumor) has a "signal strength" that makes it more or less difficult to detect, but the technician is trained to make the best decision (to detect cancer where it exists and to avoid false alarms). It is a very different task for the untrained eyewitness who simply possesses a memorial image of a culprit to attempt to discern that person from among *multiple* members of a lineup. Furthermore, it seems unlikely that the many factors that impact eyewitness accuracy and distort eyewitness confidence will similarly affect a radiologist. There are some important distinctions to make clear between the role and experience of the technician as compared to crime victims and witnesses. Do these vast differences potentially violate the assumptions underlying ROC analysis? Can the curves really be interpreted in the same way across fields?

Moreover, it should be noted that, in some of the published ROC studies of eyewitness identification, researchers may be making incorrect assumptions about the widespread use of best police practices, in particular the recording of witness confidence statements at the time of the identification and the use of a blind/blinded administrator. These two conditions, while extremely important and part of the best practice reform effort, are unfortunately not yet the norm in police agencies around the country. For example, Mickes and colleagues state that "...in practice, confidence ratings are already used to distinguish between the presence or absence of a guilty suspect in a lineup, and confidence-based ROC analyses are relevant to that widespread practice."[41] Nor do they mention the need for blind or blinded administration in order to eliminate possible administrator influence on witness's confidence rating, although we believe they support this reform. Dr. Wixted's presentation to the Committee touched on these very points. He affirmed his own assumption that identification procedures must be conducted by blind administrators, that prophylactic pre-lineup instructions must be given prior to the identification procedure, and that confidence statements must be taken and recorded at the time of the identification.

Finally, there are two important practical observations to be made about ROC analysis and other efforts to assess the relative utility of sequential versus simultaneous presentation. First, it must be kept in mind that before police take confidence statements from witnesses at the time of identifications they invariably say something like, "Without giving me a number or a percentage, tell me in your own words how sure (confident) you are." Unlike laboratory researchers, who take precise measurement of confidence is on a numeric scale, police and prosecutors are understandably reluctant to get percentages or numbers because of the confusion it can cause among jurors. Some jurors may believe that if a witness who is 95% or 99% "sure" that automatically means, under the law, there is a reasonable doubt about the reliability of the

[41] Mickes, L., Wixted, J. & Flowe, H. (2012). Receiver operating characteristic analysis of eyewitness memory: Comparing the diagnostic accuracy of simultaneous versus sequential lineups. *Journal of Experimental Psychology: Applied*, 18, 374.

identification. Our experience shows that law enforcement officials are comfortable with taking confidence statements at the time of the identification *because* the "best practice" question includes a warning not to give a number or percentage. This practical problem has to be taken into account by ROC studies that have used finely calibrated confidence statements for their analysis.

Secondly, one benefit of significantly reducing filler picks – unquestionably a by-product of sequential presentation – has not been adequately emphasized or studied: The damage done to investigations when a witness selects a filler. After making a filler pick, police may be reluctant to continue the investigation or show a witness additional lineups because the witness may be viewed as "burned" or no longer useful since she has identified a known-innocent (the filler). The witness herself may become reluctant to make additional lineup viewings or otherwise become discouraged about participating further in an investigation. Even more troubling, an accurate eyewitness who eventually selects the true culprit could be doubted by a jury because the witness previously selected a filler who looked like the true culprit – the usual reason for misidentification as demonstrated in the landmark study by Dr. Wells.[42] In short, filler picks present serious impediments to the successful apprehension and conviction of the guilty that are not adequately captured.

THE INNOCENCE PROJECT'S EYEWITNESS IDENTIFICATION POLICY AND LAW REFORM EFFORT

In light of the role eyewitness misidentification has played in wrongful convictions, the characteristics of the wrongful convictions, and the scientific research on eyewitness memory and perception, the Innocence Project has taken a two pronged approach to its eyewitness identification law reform effort. On the one hand, we aim to eliminate risk factors for misidentification at the front end by improving police procedures. On the other hand, we work to ensure that courts formulate and apply a legal framework for evaluating eyewitness identification that accurately reflects the current state of the scientific research. That framework should be sensitive to changes in the research, and should provide a range of intermediate remedies to ensure that jurors who do hear eyewitness identification evidence are not unduly prejudiced by the evidence and have the necessary context and tools to properly evaluate this complex and often critical evidence.

Police Procedure Reform

More than a quarter century of peer-reviewed research guides the substance of the Innocence Project's primary eyewitness identification policy reform recommendations, which include: double-blind administration; prophylactic pre-lineup instructions to the eyewitness; filler match to witness description (not suspect); recorded confidence statement taken at the time of the identification; sequential presentation[43] and recording and documentation of the procedure. Our experience has shown that when police officers are provided with education about the value of

[42] Wells, G.L. (1993). What do we know about eyewitness identification? *American Psychologist,* 48, 553-71.
[43] We support sequential presentation as conducted in the AJS Field Study, where the witness will be able to view the lineup a second time if requested.

the new procedures and trained in how to readily employ those changes, they appreciate the value of the enhanced procedures to their daily work.

Efforts to apply scientific research to modify traditional police practice in the area of eyewitness identification began with a federal inquiry. More than a decade ago the Department of Justice (DOJ) established a technical working group which sought to identify best practices supported by rigorous social science research. The National Institute of Justice – the research arm of the Department of Justice – formed the "Technical Working Group for Eyewitness Evidence," composed of membership from the scientific, legal and criminal justice communities, which recommended a series of protocols in a report and an attendant training manual.[44]

Since its publication, a number of bar associations, police groups, and state commissions have conducted more comprehensive consideration of these reforms. The American Bar Association's House of Delegates adopted Resolution 111C in 2004, a statement of Best Practices for Promoting Accuracy of Eyewitness Identification Procedures that delineated general guidelines for administering lineups and photo arrays. In a report of the American Bar Association's Criminal Justice Section's Innocence Committee to Ensure the Integrity of the Criminal Process, the ABA resolved that federal, state and local governments should be urged to adopt a series of principles consistent with those contained in its resolution, incorporating scientific advances in research that has been developed over time.

In 2006, the International Association of Chiefs of Police (IACP) published a "Training Key on Eyewitness Identification," which concluded that "of all investigative procedures employed by police in criminal cases, probably none is less reliable than the eyewitness identification. Erroneous identifications create more injustice and cause more suffering to innocent persons than perhaps any other aspect of police work. Proper precautions must be followed by officers if they are to use eyewitness identifications effectively and accurately." The IACP Training Key endorses a number of key reforms, including instructing the witness, blind administration, sequential presentation of lineup members or photos, obtaining a confidence statement and recordation of the procedure. Four years later the IACP issued a Model Policy that endorsed the same package of reform recommendations.[45]

The body of work produced by these prominent criminal justice, legal and policing entities has nourished efforts to address misidentification on the state and local level. In April 2001, New Jersey became the first state in the nation to officially adopt scientifically-supported reform recommendations when the Attorney General issued *Guidelines for Preparing and Conducting Photo and Live Lineup Identification Procedures*, mandating implementation of the "blind-sequential" package of reforms by all law enforcement agencies statewide.[46] In May 2005, the Criminal Justice Standards Division of the North Carolina Department of Justice endorsed

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[44] Technical Working Group for Eyewitness Evidence, Eyewitness Evidence: A Guide for Law Enforcement (1999), *available at* https://www.ncjrs.gov/pdffiles1/nij/178240.pdf; Technical Working Group for Eyewitness Evidence, Eyewitness Evidence: A Trainer's Manual for Law Enforcement (2003), *available at* https://www.ncjrs.gov/nij/eyewitness/188678.pdf.

[45] Int'l Association of Chiefs of Police, National Law Enforcement Policy Center Eyewitness Identification Model Policy (2010).

[46] State of New Jersey, Dept. of Law and Public Safety, Office of the Attorney General, Guidelines for Preparing and Conducting Photo and Live Lineup Identification Procedures (2001).

recommendations set forth in the North Carolina Actual Innocence Commission's report, *Recommendations for Eyewitness Identification*, which included "blind" and "sequential" lineups.[47] In September 2005, the Wisconsin Attorney General's Office followed New Jersey's lead and issued a similar set of policies for statewide use, *Model Policy and Procedure for Eyewitness Identification*, which also led to implementation of the "blind-sequential" reform package.[48] In 2006, the California Commission on the Fair Administration of Justice, comprised of key criminal justice stakeholders from across the state of California, embraced a set of reforms in its Report and Recommendations Regarding Eye Witness Identification Procedures.[49]

A small but significant number of legislatures[50] across the country have already reformed – or required the reform of – their eyewitness identification procedures. The entire states of Connecticut, New Jersey, North Carolina, Ohio, Oregon, Rhode Island and Texas now employ the blind administration of line-ups, obtain confidence statements, provide instructions to eyewitnesses, and properly compose photographic and live line-ups as standard practice statewide. There are a number of additional legislative efforts underway as of this writing. Legislation is expected to be introduced in the 2014 legislative sessions in the states of Delaware, Georgia, Maryland, Massachusetts and Vermont.

Rather than mandate the uniform use of scientifically-supported "best practices" at the local law enforcement agency level through legislation, some states, including Arizona, Georgia, Maryland, Michigan, Oregon, Vermont and Virginia have issued model policies and produced attendant, enhanced training programs grounded in "best practices" at their respective training academies. While these efforts represent a significant step towards the application of best practices, in most instances, we have found that – absent a mandate – uniform statewide adoption at the local level at the local law enforcement agency level does not come to pass.

Many statewide reform efforts begin in earnest when a major city or jurisdiction voluntarily adopts the reform protocol. As a result, the Innocence Project focuses an aspect of its reform work at the local level. In recent years, major cities including Baltimore, MD; Boston, MA; Dallas, TX; Denver, CO; Minneapolis/St. Paul, MN; Roanoke, VA and San Francisco, CA have voluntarily adopted the "blind-sequential" package of reforms as standard practice. Commissioner Charles Ramsey of the Philadelphia Police Department recently announced his intentions to do the same in the coming weeks.

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[47] North Carolina Dept. of Justice, Criminal Justice Standards Div. Recommendations for Eyewitness Identification, (2005).

[48] State of Wisconsin, Office of the Attorney General, Model Policy and Procedure for Eyewitness Identification (2005), *available at* http://www.doj.state.wi.us/sites/default/files/2009-news/eyewitness-public-20091105.pdf.

[49] *See* http://ccfaj.org/documents/reports/eyewitness/official/eyewitnessidrep.pdf.

[50] CONN. GEN. STAT. § 54-1p (2012); MD. CODE ANN., PUB. SAFETY § 3-506 (LexisNexis 2011); NEV. REV. STAT. § 171.1237 (2011);N.C. GEN. STAT. § 15A-284.52 (2011); OHIO REV. CODE ANN. § 2933.83 (LexisNexis 2010); R.I. GEN. LAWS 1956, § 12-1-16 (2010); TEXAS CRIM. PROC. CODE ANN. art. 38.20 (West 2005); VA.CODE ANN. § 9.1-102 (2013); VA.CODE ANN. § 19.2-390.02 (2005); W. VA.CODE ANN. § 62-1E-2 (LexisNexis 2007); WIS.STAT. ANN. § 175.50 (West 2006); H.R. 470, 2010 Leg., Reg. Sess. (Vt. 2010); H.R. 352, 149th Gen. Assemb., Reg. Sess. (Ga. 2007).

One impediment to science-based policy reform occurs where policymakers perceive that the reforms are not practicable given available resources, history or custom within a police or prosecutorial community, or that the reforms will undermine law enforcement's ability to apprehend wrongdoers. We have found most, if not all, of these concerns to be unwarranted or, at most, easily remedied through modifications to a laboratory-based protocol. For instance, practical considerations for small police agencies struggling to implement blind reform where all officers necessarily knew the identity of the suspect resulted in the creation of the "folder shuffle" method, which, when properly implemented, effectively blinds an administrator who knows the identity of the suspect. It is crucial that policymakers not permit scientifically unsupported practices to be used to address practical considerations. For instance, policies that permit an officer who knows the identity of the suspect to administer a lineup so long as he "remains neutral" are controverted by research findings about experimenter expectancy effects that support the use of blind or blinded administration. Advising law enforcement to "remain neutral" will neither undercut the effects of inadvertent cuing from the administrator nor deter an eyewitness from seeking feedback from the administrator. Such a procedure is far from the blind administration required by research findings and generally accepted scientific protocols. Similarly, protocols that do not require law enforcement to take a statement of confidence from the eyewitness at the time the identification is made – a reform grounded in a large body of research that demonstrates the contaminating effects of confirming feedback – will result in the loss of critical baseline evidence about witness confidence. It is our hope that the Committee will affirm settled scientific research findings with a degree of specificity that ensures any modifications to laboratory protocols in the field adhere to scientific conclusions.

A second fundamental obstacle to the implementation of reform procedures is stakeholder reliance on scientifically flawed field studies. Our earliest eyewitness identification reform efforts were stymied by the 2006 publication of the "Illinois Field Study" report. While the findings and methodology from this inquiry have been discredited by independent scholars,[51] including a blue ribbon panel of notable scientists,[52] the impact of the report's flawed conclusion that sequential, double-blind eyewitness identification practices result in substantial losses of suspect picks continues to be felt in the policy realm.

The Innocence Project strongly endorses the utility of field studies to inform investigative practice with the understanding that the findings of these real world experiments are as reliable as their design. Law enforcement, when convinced of the value of reform procedures, is a central voice to assuring policy change. Logically, those expected to implement modifications to identification protocols are eager to understand how those changes will actually affect their investigative practice and therefore usually place greater faith in field than laboratory studies. Consequently, it would be of great service to law enforcement and policymakers if the Committee could: (1) survey existing and ongoing field studies to determine if the methodologies employed are scientifically reliable; and (2) issue a set of recommended protocols and guiding principles for field studies to be undertaken in the future.

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[51] *See, e.g.*, Steblay, N. *supra* n.34.

[52] Schacter, D., Dawes, R., Jacoby, L., Kahneman, D., Lempert, R., Roediger, H. & Rosenthal, R. (2008). Policy forum: Studying eyewitness investigations in the field. *Law and Human Behavior*, 32, 3-5. (concluding that the study's confound – comparing sequential blind procedures with simultaneous non-blind procedures – "has devastating consequences for assessing the real-world implications of this particular study.")

Legal Framework Reform

The *Manson* Balancing Test

In 1977, the U.S. Supreme Court codified the test for admissibility of eyewitness identification evidence in the face of a due process challenge.[53] The two-part balancing test directs courts to first determine if a challenged identification procedure was unduly suggestive and, if so, to then balance the effects of suggestion against reliability factors and suppress the evidence only if there is a "substantial probability of an irreparable misidentification." The Court identified five reliability factors: (1) the witness' opportunity to view the perpetrator; (2) the witness' degree of attention; (3) the accuracy of the witness' description; (4) the witness' level of certainty at the time of the confrontation; and (5) the time between the crime and confrontation.[54] While *Manson* declared these factors to be non-exhaustive, courts applying the *Manson* test have generally only applied these five factors.

The *Manson* balancing test was adopted by every jurisdiction in the country[55] and essentially remained the universal test until New Jersey rejected it on state due process grounds in a landmark 2011 case.[56] In 2012, the Oregon Supreme Court followed suit and rejected the *Manson* balancing test.[57] The Massachusetts Supreme Judicial Court appears poised to take similar action following a report issued by a study group the Court created to examine all aspects of the way eyewitness identification evidence is treated in that state.[58]

The U.S. Supreme Court has not yet been presented with a direct challenge to the ongoing validity of the *Manson* balancing test. Indeed, the Court has only issued one ruling directly addressing eyewitness identification since *Manson* – the 2012 decision, *Perry v. New Hampshire*.[59] In that case, the Court addressed whether a suggestive identification procedure that is not orchestrated by state actors could be subject to due process scrutiny. The Court held that the Due Process Clause does not require an inquiry into the reliability of an eyewitness identification when the identification was not procured under unnecessarily suggestive

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[53] *Manson v. Brathwaite*, 432 U.S. 98 (1977).
[54] *Id.* at 114-15.
[55] The nomenclature used and application of the *Manson* due process balancing test in state courts is distressingly confused. Sometimes the courts have characterized the *Manson* balancing test as an inquiry into "independent source," a term used in *United States v. Wade*, 87 S.Ct. 1926 (1967), and its progeny. The *Wade* line of cases addressed whether to admit an in-court identification notwithstanding a Sixth Amendment right to counsel violation during the out-of-court identification procedure (the *Wade* independent source factors and Manson reliability factors are very similar). Although New York, Massachusetts and Wisconsin's highest appellate courts automatically suppress unduly suggestive out-of-court identification procedures (*see infra* n.89) other than showups soon after an incident (the automatic suppression of suggestive out-of-court procedures was actually the issue before the *Manson* court), a number of state trial courts will confusingly suppress out-of-court identification procedures using the *Manson* balancing test but admit in-court identifications that follow claiming "independent source." *See* Brandon Garrett, *Eyewitnesses and Exclusion*, 62 Vanderbilt L. Rev. 485-488 (2011).
[56] *Henderson*, 27 A.3d at 285.
[57] *State v. Lawson*, 291 P.3d at 724, 749-63 (Or. 2012).
[58] *See Com. v. Walker*, 953 N.E.2d 195, 208 n.16 (Mass. 2011). *See also* Supreme Judicial Court Study Group on Eyewitness Identification, Report and Recommendations to the Justices (2013), *available at* http://www.mass.gov/courts/sjc/docs/eyewitness-evidence-report-2013.pdf. (Hereinafter "SJC Report.")
[59] 132 S.Ct. 716 (2012).

circumstances by law enforcement.[60] This result was consistent with the Court's due process jurisprudence that requires state action to trigger a due process violation.[61] Importantly, however, the *Perry* Court recognized the critical role of state evidentiary rules[62] in helping courts act as gatekeepers of unreliable eyewitness identification evidence, and of intermediate remedies, including jury instructions[63] and expert testimony,[64] to assist the jury in evaluating eyewitness identification evidence that has been admitted. While *Perry* is binding precedent on courts applying the federal due process clause, state courts are free to conclude that their state constitutional due process protections are greater than those offered by the federal constitution and may, therefore, extend to identification evidence that is the product of suggestive procedures orchestrated by private actors.

As early as 1983, social scientists recognized that the balancing test set forth by the Supreme Court in *Neil v. Biggers*, and adopted by the Court in *Manson* was not supported by scientific research findings.[65] As the research developed, so too did the realization that the *Manson* balancing test is confounded and incapable of achieving its goal of ensuring that "[r]eliability is the linchpin in determining the admissibility of identification testimony."[66] The *Manson* balancing test fails because (1) the use of a suggestive identification procedure, in and of itself, tends to falsely inflate the self-reported reliability factors (opportunity to observe, attention paid, and certainty); (2) confirming feedback falsely inflates the self-reported reliability factors and, even with best efforts, some form of confirming feedback is virtually inevitable between the time a witness makes an identification and the time a witness testifies at a trial; (3) there is little support for description accuracy being an accurate measure of reliability; and (4) witness certainty at the time of the identification is the only certainty statement that even weakly correlates with reliability and that certainty statement, not an in-court statement of certainty, is the only certainty statement that should go before a jury.

Of the several flaws in the existing *Manson* approach, none is more fundamental than the effect of suggestive procedures on the reliability factors. As the New Jersey Supreme Court explained in *Henderson*, "[W]hen [self-]reports are tainted by a suggestive process, they become poor measures in a balancing test designed to bar unreliable evidence."[67] Thus, despite the fact that suggestive identification procedures actually *decrease* reliability, suggestion can increase the likelihood that a court applying *Manson* will find that the identification was reliable. "The irony of the current test is that the more suggestive the procedure, the greater the chance eyewitnesses will seem confident and report better viewing conditions."[68]

Reforming *Manson*

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[60] *Perry*, 132 S.Ct. at 718.
[61] *Colorado v. Connelly*, 107 S.Ct. 515 (1986).
[62] *Perry*, 132 S.Ct. at 728.
[63] *Id.* at 729.
[64] *Id.*
[65] *See* Wells, G. & Murray, D. (1983). What can psychology say about the Neil v. Biggers criteria for judging eyewitness accuracy? *Journal of Applied Psychology*, 68, 347-362.
[66] *See Id. See also* Wells, G. & Quinlivan, D. (2009). Suggestive eyewitness identification procedures and the supreme court's reliability test in light of eyewitness science: 30 years later, *Law and Human Behavior*, 33, 9-10.
[67] *See Henderson*, 27 A.3d at 286.
[68] *Id.*

Since 2005, the Innocence Project has been pursuing a long-term law reform litigation strategy to create a new legal framework for the assessment and regulation of eyewitness evidence. The goal of this work is the adoption, in every jurisdiction in the country, of a legal framework that prevents future wrongful convictions based on eyewitness misidentification, reflects advances in scientific research over the last thirty years, and provides a dynamic model to integrate future scientific developments. This law reform effort proceeds on a track parallel to the Innocence Project's longstanding policy reform efforts, which aim to ensure the mandatory or voluntary adoption of scientifically supported best police practices for conducting eyewitness identification procedures and ongoing law enforcement training to ensure the consistent application of these best practices (which will have room to evolve as scientific research develops).

Regardless of whether the best police practices are embodied in legislation, statewide administrative regulations, or in local law enforcement procedures, and regardless of what procedures are adopted (or not adopted), eventually the critical decisions concerning this evidence will come back to the courts for assessment pre-trial and for evaluation by juries. For this reason alone, making sure the legal framework reflects and remains open to good and established scientific findings is critical. It's not just important to make sure that state and federal courts account for the extraordinary scientific advances in experimental psychology in the last thirty years, it is even more important to develop a framework that makes sure the courts do not lag too far behind the science again, while not getting too far ahead either.

That is not to say that the policy reform efforts are not also critical. They are. In fact, the effort to reform policy is strongly supported by the adoption of a new legal framework that reflects scientific knowledge, as it helps to create pathways for reform from the bottom up, thereby engendering better functioning throughout the criminal justice system. The new legal framework and the role of the judiciary is deeply interconnected with the reform of police practices in the area of eyewitness identification evidence as well as the training of law enforcement in the consistent implementation of these evidence-based practices.

A new legal framework should, at a minimum, achieve four goals:

a. Identify the scientific research about which there is a consensus;

b. Integrate the consensus science findings into pre-trial assessment of eyewitness evidence and evaluation by juries;

c. Provide a procedural mechanism dynamic enough to account for new science as it gains consensus;

d. Allow courts to focus on the cases where there is the greatest chance of misidentification and avoid unnecessary expenditure of judicial resources.

We have also identified a minimum set of features that any new legal framework should have to achieve these goals:

a. Eliminate the balancing test set forth by the United States Supreme Court in *Manson*;

b. Eliminate *Manson's* "all or nothing" approach, which offers courts only two choices when evaluating identification evidence: suppress or admit;

c. Use intermediate remedies that ensure that jurors have information and context for critical evaluation of eyewitness evidence (instructions, experts, *in limine* rulings);

d. Hold pre-trial hearings that allow for the consideration of data and evidence that enhances the capability of the trial court to evaluate the strength of witness memory and the sources of potential memory contamination. This will assist courts in formulating intermediate remedies that counsel from both sides will be aware of before the trial commences. This would involve increased use of experts at pre-trial hearings, more testimony from witnesses about the strength of their recollection, and better evaluation of identification procedures;

e. In small number of problematic cases estimator variables alone can provide a basis for holding pre-trial evidentiary hearings concerning the reliability of identification evidence even if there is no suggestive conduct.

f. Use special masters or blue ribbon committees to review scientific data and make recommendations for incorporating new scientific findings (including in jury instructions);

g. Rely on state evidence rules as well as state and federal constitutional doctrine;

h. Suppress either the out-of-court or in-court identifications when there is a substantial probability of misidentification.

THREE EXAMPLES OF SUCCESSFUL EYEWITNESS IDENTIFICATION LAW REFORM: NEW JERSEY, OREGON AND MASSACHUSETTS

New Jersey

In 2011, the New Jersey Supreme Court became the first court in the nation to reject the flawed *Manson* balancing test, finding that in "the thirty-four years since the United States Supreme Court announced a test for the admission of eyewitness identification evidence, which New Jersey adopted soon after, a vast body of scientific research about human memory has emerged. That body of work casts doubt on some commonly held views relating to memory. It also calls into question the vitality of the current legal framework for analyzing the reliability of eyewitness identifications."[69]

The New Jersey Supreme Court's decision was the direct result of the 2001 issuance of mandatory guidelines for conducting eyewitness identification procedures by New Jersey's Attorney General, John Farmer, Jr., who under New Jersey law has plenary authority over all law

[69] *Id.* at 217.

enforcement agencies in the state.[70] ("Attorney General's Guidelines" or "Guidelines"). Under New Jersey law, the Guidelines – which provided for the blind administration of identification procedures; the provision of prophylactic pre-lineup instructions to witnesses; fair lineup construction (including minimum number of fillers; proper filler selection; and one suspect per lineup); sequential presentation when possible; avoidance of feedback to the witness; and recording of the procedure, including a witness confidence statement – were binding on all law enforcement agencies in New Jersey.

While twelve other states now require or recommend the use of some or all of the reform procedures embodied in New Jersey's Guidelines, in 2001 no other state had even considered such reforms. Indeed, it would be another four years until a second state (Wisconsin) implemented comprehensive eyewitness identification reform. In addition to improving police practices in the state, the Guidelines had an upstream effect: courts routinely considered the identification procedures used in a given case and, in doing so, were often presented with the social science underlying the reforms, thus becoming experienced with the research concerning memory and perception. In this way, the Guidelines were an essential precursor to the issuance of the *Henderson* decision twelve years later. Because law enforcement was required to follow a set of specified practices in conducting identification procedures, it was inevitable that cases would come up through the system where the Guidelines were not followed and the practices used violated fundamental scientific best practices. The question for the courts to answer, then, was when a violation required suppression, whether remedies short of suppression were appropriate, and, if so, what those remedies would look like.

In 1999, the same year the Guidelines went into effect, the New Jersey Supreme Court decided *State v. Cromedy*,[71] reversing a conviction for rape and related crimes on the grounds that the trial court's refusal to instruct the jury on cross-racial identification, as requested by the defendant, deprived the defendant of a fair trial.[72] The Court limited its holding, however, finding that a cross-race jury instruction must be given when "identification is a critical issue in the case, and an eyewitness's cross-racial identification is not corroborated by other evidence giving it independent reliability."[73] *Cromedy* was a critical development in the New Jersey Supreme Court's eyewitness identification jurisprudence and, in retrospect, laid an important foundational approach for *Henderson* in two ways: first, the court considered, endorsed and relied upon scientific research in reaching its conclusion; and second, the Court implemented intermediate remedies whose purpose was to educate jurors about scientific research and contextualize the identification evidence that jurors would be tasked with assessing. The Court went on to decide three more eyewitness identification cases in the 2000s: *State v. Herrera*,[74] where the court found showup identification procedures inherently suggestive; *State v.*

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[70] Office of the Attorney General, Department of Law and Public Safety, Attorney General Guidelines for Preparing and Conducting Photo and Live Lineup Identification Procedures (2001), *available at* http://www.njdcj.org/agguide/photoid.pdf.

[71] 727 A.2d 457 (N.J. 1999), *abrogated by Henderson*, 27 A.3d at 926 ("[T]he additional research on own-race bias . . . and the more complete record about eyewitness identification in general justify giving the [cross-racial identification] charge whenever cross-racial identification is in issue at trial.")

[72] *Id.* at 464.

[73] *Id.* at 467.

[74] 902 A.2d 177 (N.J. 2006).

Delgado,[75] where the court required police to maintain detailed record of identification procedures; and *State v. Romero,*[76] where the court modified the model jury charge on eyewitness testimony because 'eyewitness identification testimony requires close scrutiny and should not be accepted uncritically.'

Ten years later, *Henderson* came to the New Jersey Supreme Court on appeal following a conviction for various crimes, including reckless manslaughter, aggravated assault, and various weapons charges, arising out of a 2003 murder in a Camden, New Jersey apartment. The primary evidence against Henderson at trial consisted of the statement of a single eyewitness and an investigating officer's testimony about Henderson's post-arrest statement.[77] During the course of the investigation, the eyewitness – who, at the time of the crime, had been held at gunpoint in a dark, narrow hallway by a stranger – was presented with an eight-person photographic lineup by a blind administrator, consistent with the Guidelines.[78] The witness was provided with prophylactic pre-lineup instructions and viewed the lineup members sequentially, also in keeping with the Guidelines.[79] The witness quickly eliminated five of the photographs, then eliminated a sixth, after which he said he "wasn't 100 percent sure of the final two pictures."[80] At that point, the independent administrator left the room and the two investigating offers entered and conferred with the witness, violating the Guidelines' requirement that the identification procedure administrator be blind.[81] The officers and the witness offered different accounts of what happened after they entered the room when examined in a pre-trial hearing. All agreed, however, that at a point after the investigating officers entered the room, the witness selected the photograph of the police suspect, Mr. Henderson.

When it reviewed Henderson's appeal in 2009, the New Jersey Supreme Court declared that the trial record was inadequate to "test the current validity of [New Jersey] state law standards on the admissibility of eyewitness identification" and directed that a plenary hearing be held "[t]o consider and decide whether the assumptions and other factors reflected in the two-part *Manson/Madison* test, as well as the five factors outlined in those cases to determine reliability, remain valid and appropriate in light of recent scientific and other evidence."[82]

The Court directed the parties, together with *Amici* Innocence Project and Association of Criminal Defense Lawyers of New Jersey, to participate in remand proceedings, which were presided over by Special Master Geoffrey Gaulkin, a retired New Jersey state appellate judge appointed by the New Jersey Supreme Court to handle the matter. Judge Gaulkin conducted the proceedings "more as a seminar than an adversarial litigation."[83] The parties submitted, and Judge Gaulkin considered, extensive scientific materials including more than 200 published scientific studies, articles and books. Judge Gaulkin presided over 10 days of evidentiary

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[75] 902 A.2d 888 (N.J. 2006).
[76] 922 A.2d 693 (N.J. 2007).
[77] *Henderson*, 27 A.3d at 220-21.
[78] *Id.* at 221.
[79] *Id.*
[80] *Id.*
[81] *Id.* The witness and the investigating officer offered differing testimony concerning the substance of the conversation between them.
[82] *Id.* at 306.
[83] Report of the Special Master at 3; *Henderson*, 27 A.3d at 872.

hearings, at which seven expert witnesses – leading scientists in the field of eyewitness identification study – testified. He also heard oral argument and received detailed proposed findings of fact and conclusions of law.[84] On June 18, 2010, based on his consideration of all of the information presented by the parties, Judge Gaulkin issued his report (the "Special Master's Report").

The Special Master's Report endorsed the remedy set forth by the Innocence Project in its proposed legal findings, "The Renovation of *Manson*: A Dynamic New Legal Architecture For Assessing and Regulating Eyewitness Evidence," as "wide-ranging, multifaced and highly detailed,"[85] and proposed that the current legal framework be modernized "to maintain the *Manson/Madison* principle that reliability is the linchpin of the inquiry, to expand that inquiry to include all the variables unaddressed by *Manson/Madison* and to ensure that judges and jurors are informed of and use the scientific findings that bear on reliability."[86]

The Special Master's proposed new design had two core elements: first, that courts treat eyewitness identification evidence as trace and scientific evidence by placing the initial burden on the prosecution to demonstrate the reliability of the evidence; and second, to take "all available steps" to ensure that judges and juries are informed of and guided by scientific findings.[87]

In issuing its final decision in *Henderson,* the New Jersey Supreme Court adopted many of the recommendations set forth in the Special Master's Report. The Court endorsed the scientific research considered by the Special Master, describing it as the "gold standard in terms of the applicability of social science research to the law."[88] The Court did not, however, adopt the trace evidence analogy. While the court acknowledged that memories do exist as physical traces in the brain,[89] as a legal matter the court did not embrace the analogy that would shift the burden of production to the prosecution. Nor did the Court accept the Innocence Project's assertion that, in certain extremely problematic cases, estimator variables alone could trigger a reliability hearing.

Based on its review of the scientific research and the role of eyewitness misidentifications in wrongful convictions, the New Jersey Supreme Court took the unprecedented action of rejecting the *Manson* balancing test[90] in favor of a totality of the circumstances test that would allow for the consideration of all relevant evidence – whether relating to system or estimator variables – when making a determination about the reliability of eyewitness identification evidence. The

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[84] *Id.* at 3-4.
[85] *Id.* at 84.
[86] *Id.* at 84-86 (citations omitted and emphasis added).
[87] *Id.*
[88] *Henderson*, 27 A.3d at 283.
[89] *Id.* at 295 ("[L]ike traces of DNA or drops of blood, memories are part of our being.").
[90] New York, Massachusetts, and Wisconsin follow a *per se* rule requiring suppression of out of court identifications that were the product of unnecessarily suggestive identification procedures. However, those courts then engage in a second step analysis that will allow the in-court identification if the witness has an "independent basis" for the identification. The independent basis tests in these jurisdictions essentially mirror the reliability factors set forth in *Manson*. Thus, it cannot be said that these jurisdictions have abandoned the *Manson* balancing test. Rulings in Massachusetts, South Carolina and Wisconsin all provide examples. *See, e.g., People v. Adams*, 423 N.E.2d 379, 384 (N.Y. 1981); *Com. v. Martinez*, 857 N.E.2d 1096 (Mass. 2006); *State v. Dubose*, 699 N.W.2d 582, 596 (Wis. 2005).

new test provides: (1) defendants can obtain a pretrial hearing by showing "some evidence of suggestion that could lead to a mistaken identification"; (2) the State must then offer proof to show that the proffered eyewitness identification is reliable, considering both system and estimator variables, and (3) the ultimate burden is on the defendant to prove a very substantial likelihood of irreparable misidentification.[91]

The revised legal framework set forth in *Henderson* has two principal features: pretrial hearings that are granted whenever a defendant can show "some evidence of suggestiveness that could lead to mistaken identification,"[92] which allow for the presentation of all system and estimator variables once the defendant has met this burden; and enhanced jury instructions that educate jurors about all aspects of eyewitness identification and memory, and may be given to the jury at the close of evidence as well as during the trial when the witness testifies.[93]

While the New Jersey Supreme Court recognized that expert testimony may be useful at trial – provided it is otherwise admissible under New Jersey law – the Court indicated a clear preference for expansive, science-based jury instructions that inform juries of the scientific research about the factors that can affect the reliability of eyewitness identifications.[94] The New Jersey Supreme Court directed the Criminal Practice Committee and the Committee on Model Criminal Jury Charges to draft proposed revisions to the current charge on eyewitness identification and submit them to the court for review; the court revised and accepted the new jury instructions on July 19, 2012.[95]

Much as *Henderson* represented a wholesale change in the law, so too did these jury instructions represent a complete break with the past, both in New Jersey and in the rest of the country. New Jersey's new eyewitness identification instructions capture the scientific research on estimator and system variables and present it in plain English that is easily understandable and applicable to the facts for jurors.[96] It is these very qualities that separate the instructions from more traditional instructions – known as *Telfaire* instructions[97] – which have been widely criticized for being difficult to understand and offering insufficient guidance for how a variable actually functions on memory or perception (i.e., these instructions would tell jurors to consider a variable such as stress without offering guidance on what, exactly, is known about how stress affects memory and perception.) While New Jersey's new instructions have not yet been tested by scientists, there is good reason to believe that they will help jurors with the complex task of evaluating eyewitness identification evidence.[98] This is not to say that these instructions are perfect. Indeed, as we raised in our testimony before the New Jersey Supreme Court, the

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[91] *Henderson*, 27 A.3d at 288-89.
[92] *Id.* at 288.
[93] *Id.* at 296.
[94] *Id. See supra* n.69.
[95] *See* New Jersey Eyewitness Identification Instructions, *available at* http://www.judiciary.state.nj.us/pressrel/2012/jury_instruction.pdf.
[96] As discussed elsewhere in this document, additional research on the efficacy of jury instructions in cases involving eyewitness identification evidence is necessary and should be called for in the Committee's report.
[97] *United States v. Telfaire*, 469 F.2d 552 (D.C. Cir. 1972). An example of traditional *Telfaire* instructions are available at: http://www.briefcase8.com/Telfaire-Instruction.pdf.
[98] As discussed *infra*, we believe that jurors will be best equipped to critically evaluate eyewitness identification evidence through a combination of expert testimony and robust jury instructions.

instructions are silent on the known effects of failure to follow mandated best practices and do not adopt strong cautionary language where the reliability of eyewitness identification evidence is undermined by the presence of either system or estimator variables. These kinds of instructions should be adopted, together with the type of instructions adopted in New Jersey, in every jurisdiction in the country. As the New Jersey Supreme Court recognized, such instructions should be given prior to any testimony about the identification evidence so that jurors receive the testimony through an informed lens and again at the close of evidence.[99] This timing recommendation is critical and should be applied by courts even where they do not adopt modernized instructions.

Finally, the *Henderson* opinion endorsed many of the police practices already required by the Attorney General's Guidelines and, through the court's supervisory powers, required additional police practices. These included a requirement that law enforcement inquire whether witnesses have had any communication with third parties concerning their observations and, if so, to take a written statement of the substance of those communications which must be disclosed to defense counsel.[100]

The legal and scientific communities have hailed *Henderson* as a landmark ruling for its recognition that the *Manson* balancing test fails to achieve its objective, and for its attempt to offer a new approach that brings to bear the vast body of scientific research on the problem of assessing the reliability of eyewitness misidentification. However, some have expressed concern with the court's reliance on jury instructions as opposed to expert testimony as a vehicle for informing juries about "empirical framework" evidence. The scientific literature is sparse and somewhat mixed on the efficacy of jury instructions in educating jurors about complex aspects of memory and perception.[101] The ultimate test of the success of the *Henderson* model will, of course, be seen in courtrooms throughout New Jersey in years to come.

Together with *Henderson*, the New Jersey decided a companion case, *State v. Chen*,[102] which has been the subject of substantially less attention although it is no less critical a decision. *Chen* addressed how courts should handle identifications that are the product of highly suggestive circumstances orchestrated by private – not state – actors. The New Jersey Supreme Court found that because there was no state action, a *Wade* hearing (triggered by a possible due process violation) was not required but that that conclusion "hardly ends the inquiry. We must consider the admission of eyewitness identification tainted by private suggestive procedures in light of the

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[99] *Henderson*, 27 A.3d at 296.

[100] *Henderson*, 27 A.3d at 270.

[101] *See, e.g.*, Greene, E. (1988). Judges' instruction on eyewitness testimony: Evaluation and revision. *Journal of Applied Social Psychology*, 18, 260; Jennifer L. Devenport et al., "Effectiveness of Traditional Safeguards Against Erroneous Conviction Arising from Mistaken Eyewitness Identification," in Expert Testimony on the Psychology of Eyewitness Identification 51-62 (Brian L. Cutler ed., 2009); Cutler, B., Dexter, H. & Penrod, S. (1990). Nonadversarial Methods for Sensitizing Jurors to Eyewitness Evidence. *Journal of Applied Social Psychology*, 20, 1198-1200; Ramierez, G., Zemba, D. & Geiselman, R.E. (1996). Judges cautionary instructions on eyewitness testimony. *American Journal of Forensic Psychology*, 14, 56. ("The revised instructions . . . led to a significant effect on the subjects' expert knowledge of eyewitness factors.").

[102] *State v. Chen*, 27 A.3d 930 (N.J. 2011).

rules of evidence and the trial courts' gatekeeping function. . . Courts have a gatekeeping role to ensure that unreliable, misleading evidence is not admitted."[103]

The *Chen* court explained its evidentiary approach: courts will hold preliminary hearings under New Jersey's Rule of Evidence 104 ("Preliminary Questions") to determine, first, that the evidence is relevant and second, that the risk of "undue prejudice, confusion of issues, or misleading the jury" does not substantially outweighs its probative value.[104] The evidence will be excluded if either of these prongs is not met. In setting forth the test for cases involving private actor suggestion, the court made one modification to the test set forth in *Henderson*, requiring a higher initial threshold of suggestiveness to trigger a hearing.[105] So, suggestive behavior by a state actor that would trigger a *Wade* hearing does not automatically trigger a Rule 104 hearing if engaged in by a private actor. Instead, a private actor's behavior must be "highly suggestive" to trigger such a hearing. The test articulated in *Chen* is thus a modified version of the *Henderson* test:

> [T]he following modified approach shall apply to assess the admissibility of identification evidence when there is suggestive behavior but no police action: (1) to obtain a pretrial hearing, a defendant must present evidence that the identification was made under highly suggestive circumstances that could lead to a mistaken identification, (2) the State must then offer proof to show that the proffered eyewitness identification is reliable, accounting for system and estimator variables, and (3) defendant has the burden of showing a very substantial likelihood of irreparable misidentification.[106]

In explaining its decision, the *Chen* court relied on its discussion of the science in *Henderson*, explaining that "reliable scientific findings that are generally accepted by experts in the scientific community" make it clear that the effect of suggestive behavior is not dependent on the actor's status as a police officer (or other state actor).[107]

In *Chen*, the New Jersey Supreme Court was not presented with a case involving eyewitness identification evidence whose reliability was seriously undermined by the presence of estimator variables alone; as a result the court's decision does not speak to this issue. The evidentiary framework proposed, however – a preliminary hearing to determine the admissibility of the evidence – is equally applicable to the small number of problematic cases where estimator variables alone could so the undermine reliability of an identification that it should not be admitted, or that it should only be admitted together with tailored intermediate remedies.

Oregon

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[103] *Id.* at 937.
[104] *Id.*
[105] *Id.* at 942-43.
[106] *Id.* at 943.
[107] *Id.* at 940.

In November 2011, the Oregon Supreme Court heard arguments in two separate cases, each of which involved a criminal conviction "based, for the most part, on eyewitness identification evidence."[108] In both cases the Court of Appeals had concluded that while suggestive procedures had been used to elicit the identifications of the defendants in each case, the identifications had nevertheless been sufficiently reliable and therefore properly admitted at trial under Oregon's version of *Manson*, *State v. Classen*.[109] The Oregon Supreme Court explained its decision to grant review in these cases:

> In the 30-plus years since *Classen* was decided, there have been considerable developments in both the law and the science on which this court previously relied in determining the admissibility of eyewitness identification evidence. We allowed review in each of these cases to determine whether the *Classen* test is consistent with the current scientific research and understanding of eyewitness identification.[110]

The Innocence Network, together with a group of College and University Professors who study eyewitness memory and perception, were permitted to appear as amicus in *Lawson* (before it was consolidated with *James*, its companion case), as were the Oregon Criminal Defense Lawyers Association and the National Crime Victim Law Institute. Following briefing and argument, the Oregon Supreme Court requested that amici file all of the scientific articles cited in their briefs for the court's review. On September 2, 2011, the Innocence Network and the College and University Professors filed 76 scientific articles, whose careful review and consideration was evidenced by the Oregon Supreme Court's detailed findings of fact about how memory works and the variables known to affect eyewitness identifications.[111]

At the time the Oregon Supreme Court granted review in *Lawson* and *James*, a Public Records Act request revealed that only three local law enforcement agencies employed the blind-sequential reform package. By the time *Lawson* was heard, the Oregon legislature had considered bills mandating police reform but had not passed any law. The Oregon Supreme Court had not considered questions related to eyewitness identification evidence – for example, concerning the testimony of expert witnesses or jury instructions (whether specific, such as cross-race, or general) – in the 32 years between the court's decision in *Classen* and its grant of review in *Lawson/James*. Indeed, in the 19 times *Classen* was cited by the Oregon Supreme Court in the years between its issuance and that of *Lawson*, it was never cited in a case that affected the way that courts considered eyewitness identification evidence.[112] In short, prior to certifying the question of whether *Classen* was consistent with scientific research, neither law enforcement, the legislature nor the courts had taken conclusive action to suggest a wholesale change in the way eyewitness identification evidence would be treated in Oregon. It is fair to

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[108] *Lawson*, 291 P.3d at 678.
[109] 590 P.2d 1198 (Or. 1979).
[110] *Lawson*, 291 P.3d at 678.
[111] As discussed below, the SJC Report recommends that the Massachusetts Supreme Judicial Court adopt the appendix to *Lawson*, which contains the Oregon Supreme Court's detailed findings of science. As in *Lawson*, the SJC Report further recommends that courts should take judicial notice of these scientific findings.
[112] Indeed, in the vast majority of cases, *Classen* was referenced in the context of delays facing the litigants before the court, rather than any eyewitness-specific issue.

conclude that, among other reasons for certifying review, the court was strongly influenced by the scientific and legal findings of *Henderson*.[113]

While the *Classen* test applied the two-part *Manson* balancing test, it did so not under Oregon's constitution (as most, if not all, other states have done) but under Oregon's evidentiary code. As the court explained:

> But the Supreme Court does not purport to make the law of evidence for the states. The Court's decisions under the 14th amendment only pronounce constitutional tests which a state's rules of evidence, and their application in a particular case, may not fail; but these decisions assume that there is an applicable state rule in advance of the issue of its constitutionality. The rules governing the admissibility of evidence in state courts are the responsibility of the states before a Supreme Court decision and remain so afterwards, within the constitutional limits laid down in the decision.[114]

Explaining its preference for an evidentiary, rather than a constitutional inquiry, the court continued, "Evidence law has long provided for excluding certain evidence as a class when its questionable reliability vitiates the value of its possible truthfulness in the particular case, apart from any question of constitutional law."[115] Notably, at the time *Classen* was decided, Oregon had no statutory evidence code.[116]

And while the court in *Classen* adopted the *Manson* framework, it did so after surveying "[t]he extensive research and commentary by psychologists and jurists on the dangers of misidentification and ways to minimize them stretches back at least half a century."[117] The court in *Classen* also approved the notion that mandatory police procedures designed to minimize the likelihood of misidentification should be in place, but noted that the legislature had not seen fit to impose such requirements. It concluded its survey of the then-current judicial, psychological and policy landscape, "[w]e cite these sources to show that the unreliability of eyewitness identification under suggestive circumstances is widely recognized, and that the procedures used to minimize this unreliability bear on the admissibility of evidence of such identification."[118] Additionally, as in *Manson*, *Classen* emphasized that the five identified reliability factors were not to be viewed by courts as exhaustive:

> These are not to be taken as a mechanical checklist of "constitutional" facts. Obviously other facts may also be important,

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[113] *Lawson*, 291 P.3d at 685, n.3 ("We have also reviewed the recent opinion of the New Jersey Supreme Court in *New Jersey v. Henderson*, 208 N.J. 208, 27 A.3d 872 (2011), together with the report of the Special Master engaged in that case to inquire into the factors affecting the reliability of eyewitness identification evidence.")
[114] *Classen*, 590 P.2d at 1200.
[115] *Id.*
[116] *Lawson*, 291 P.3d at 688.
[117] *Classen*, 590 P.2d at 1200.
[118] *Id.* at 1203.

> such as the age and sensory acuity of the witness, or a special occupational concern with people's appearance or physical features, or the frequency of his or her contacts with individuals sharing the general characteristics of the person identified. Listing these and other relevant inquiries must not distract attention from the ultimate issue whether an identification made in a suggestive procedure has nevertheless been demonstrated to be reliable despite that suggestiveness.[119]

Thus, while the Oregon Supreme Court did not indicate a specific interest in eyewitness identification evidence in the years after *Classen* was decided, *Classen* itself raised many of the critical issues that courts examining the ongoing viability of *Manson* in light of the current research should also consider: the judicial, legislative, policy and psychological landscape; the need to consider evidentiary concerns when evaluating the admissibility of identification evidence (including the possibility of prejudice to the jury); and the need for courts to be open to evolving scientific research when evaluating this evidence. *Classen* offered an exemplary model from which to evaluate the "considerable developments in both the law and the science."[120]

In *Lawson*, the court began its analysis of the ongoing viability of *Classen* by looking to some of the "more than 2,000 scientific studies conducted on the reliability of eyewitness identification" and concluding that:

> [T]he scientific knowledge and empirical research concerning eyewitness perception and memory has progressed sufficiently to warrant taking judicial notice of the data contained in those various sources as legislative facts that we may consult for assistance in determining the effectiveness of our existing test for the admission of eyewitness identification evidence.[121]

Building on *Classen's* recognition that a court must stay open to scientific developments, the court cautioned:

> In identifying and describing the variables identified in the research, however, we do not seek to enshrine those variables in Oregon substantive law. We recognize that the scientific research is "probabilistic"—meaning that it cannot demonstrate that any specific witness is right or wrong, reliable or unreliable, in his or her identification. Rather, we believe that it is imperative that law enforcement, the bench, and the bar be informed of the existence of current scientific research and literature regarding the reliability of eyewitness identification because, as an evidentiary matter, the reliability of eyewitness identification is central to a criminal justice system dedicated to the dual principles of accountability

[119] *Id.* at 1203-04 (citations omitted).
[120] *Lawson*, 291 P.3d at 678.
[121] *Id.* at 685.

> and fairness. We also recognize that, although there now exists a large body of scientific research regarding eyewitness identification, the research is ongoing. Therefore, our acknowledgment of the existence of that research in these cases is not intended to preclude any party in a specific case from validating scientific acceptance of further research or from challenging particular aspects of the research described in this opinion.[122]

Upon its review of the existing research, the Oregon Supreme Court concluded:

> the process outlined in *Classen* does not accomplish its goal of ensuring that only sufficiently reliable identifications are admitted into evidence. Not only are the reliability factors listed in *Classen*—opportunity to view the alleged perpetrator, attention to identifying features, timing and completeness of description given after the event, certainty of description and identification by witness, and lapse of time between original observation and the subsequent identification—both incomplete and, at times, inconsistent with modern scientific findings, but the *Classen* inquiry itself is somewhat at odds with its own goals and with current Oregon evidence law.[123]

The Oregon Supreme Court identified two fundamental problems with the *Classen* framework: first, that the "threshold requirement of suggestiveness inhibits courts from considering evidentiary concerns" and second that the "inquiry fails to account for the influence of suggestion on evidence of reliability."[124]

In *Lawson*, the court found that *Classen's* requirement that a court could not consider an identification's reliability until evidence of suggestiveness is introduced, while proper under a due process analysis, was not proper under an evidentiary analysis. "[T]here is no reason to hinder the analysis of eyewitness reliability with purposeless distinctions between suggestiveness and other sources of unreliability"[125] Relatedly, *Lawson* found that *Classen's* burden-apportioning regime, while consistent with a due process analysis, was not consistent with evidentiary principles that a court cannot begin to evaluate whether evidence should be admitted by assuming admissibility. "In evidentiary matters, however, the proponent of the evidence . . . traditionally bears the initial burden of establishing the admissibility of the proffered evidence."[126] The court went on to note that the burden-apportionment scheme was unfair as "the

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[122] *Id.* at 685-86.
[123] *Id.* at 688.
[124] *Id.* at 689.
[125] *Id.* at 688-89.
[126] *Id.* at 689 (*citing* Oregon Evid. Code 307).

state – as the administrator of that procedure – controls the bulk of the evidence in [regard to suggestiveness]."[127]

The *Lawson* court also took issue with *Classen's* failure to account for the way that suggestion has been shown to inflate the very reliability factors that are supposed to measure whether the identification is reliable separate and apart from the suggestion: "[t]hat fact creates in turn a sort of feedback loop in which self-reports of reliability, which can be exaggerated by suggestiveness, are then used to prove that suggestiveness did not adversely affect the reliability of an identification."[128] This conclusion led the *Lawson* court to embrace the trace evidence analogy:

> [I]t is incumbent on courts and law enforcement personnel to treat eyewitness memory just as carefully as they would other forms of trace evidence . . . the evidentiary vale of which can be impaired or destroyed by contamination. [O]nce contaminated, a witness's original memory is very difficult to retrieve; it is, however, only the original memory that has any forensic or evidentiary value.[129]

The *Lawson* test is intended to be "a flexible one that will enable the state to hold offenders accountable and, at the same time, protect a criminal defendant's right to a fair trial."[130] Oregon courts now evaluating the admissibility of eyewitness identification evidence must first determine whether the proponent of the evidence has shown all preliminary facts necessary to establish admissibility beginning with relevance, which *Lawson* anticipates will "nearly always" be met (OEC 401 and 402) – and which, depending on the facts of the case, will also include proof of sufficient personal knowledge by the eyewitness (OEC 602) and proof that any identification is "both rationally based on the witness's first-hand perceptions and helpful to the trier of fact" (OEC 701).[131] Once the proponent has established these facts by a preponderance of the evidence, the burden then shifts to the defendant to establish that the probative value of the evidence is substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury or that the evidence will cause undue delay or be cumulative under OEC 403. If the court finds that the defendant has succeeded in making that showing under Rule 403, the court "can either exclude the identification, or fashion an appropriate intermediate remedy . . . to cure the unfair prejudice or other dangers attending the use of that evidence."[132] Intermediate remedies include: expert testimony, which is important in light of the fact that much of the research is either "unknown to the average juror or contrary to common assumptions"; limitations on an eyewitness's testimony to exclude prejudicial aspects, such as testimony about certainty; and case-specific jury instructions. This new legal framework allows courts to consider the totality of the circumstances surrounding the identification – the estimator and system variables – and is useful irrespective of the source of suggestion, contamination or general unreliability. The *Lawson* court concluded, "we anticipate that the trial courts will

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[127] *Id.*
[128] *Id.* at 689.
[129] *Id.*
[130] *Id.* at 697.
[131] *See id.*
[132] *Id.*

continue to admit most eyewitness identification. That is so because, although possible, it is doubtful that issues concerning one or more of the estimator variables that we have identified will, without more, be enough to support an inference of unreliability sufficient to justify the exclusion of the eyewitness identification."[133]

Massachusetts

The Massachusetts Supreme Judicial Court was one of the first state supreme courts to recognize and incorporate scientific findings into its eyewitness identification jurisprudence.[134] The SJC has been one of the most active high courts in the nation in considering matters related to eyewitness identification issues.[135]

Massachusetts also has a unique history of collaborative reform efforts involving all stakeholders in the criminal justice system – the judiciary, law enforcement, prosecutors and defense counsel. In 2004, the Suffolk County District Attorney and Boston Police Commissioner formed an eight member Suffolk County Task Force on Eyewitness Evidence, which included defense lawyers, senior police officials, Suffolk County First Assistant District Attorney and two leading experts on eyewitness identification issues. The Suffolk County Task Force's mandate was to review the investigative process in cases involving eyewitnesses and make any necessary recommendations.[136] The Suffolk County Task Force ultimately published a report which found that the recommendations made by Attorney General Janet Reno's technical working group, in its report, "Eyewitness Evidence: A Guide for Law Enforcement" in 1999,[137] did not go far enough. Instead, the Suffolk County Task Force's Report contained 25 specific recommendations for improved eyewitness identification procedures. Ultimately, written protocols containing many of these recommendations were adopted by the Boston Police Department and the Suffolk County District Attorney's Office.

On October 1, 2008, Boston Bar Association President Kathy B. Weinman announced the formation of a Boston Bar Association Task Force to Prevent Wrongful Convictions, a group whose "membership was truly divided among the major actors in the criminal justice system."[138]

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[133] *Id.*

[134] *See, e.g., Com. v. Hyatt*, 647 N.E.2d 1168 (Mass. 1995) (allowing cross-race identification jury instructions), *Com. v. Jones*, 666 N.E.2d 994, 1001 (Mass. 1996) (an unreliable identification arising from "especially suggestive circumstances" should not be admitted in evidence even where police not responsible for suggestion, under common law principles of fairness); *Com. v. Santoli*, 680 N.E.2d 1116 (Mass. 1997) (In light of the scientific research, eliminating jury instruction that instructed jurors to take a witness's confidence into account when evaluating the identification); *Com. v. Odware*, 707 N.E.2d 347, 352 (Mass. 1999) ("in some circumstances an identification that has been tainted, but not by the government, may become so unreliable that its introduction into evidence is unfair").

[135] *See, e.g., Com. v. Zimmerman*, 804 N.E.2d 336 (Mass. 2004) (addressing proper scope of hearing to determine an indigent defendant's request for an eyewitness identification expert); *Com. v. Silva-Santiago*, 906 N.E.2d 299 (Mass. 2009) (urging that police officers follow reform practices in conducting eyewitness identification procedures); *Com. v. Watson*, 915 N.E.2d 1052, 1060 (Mass. 2009) (same).

[136] The Report of this task force is available at: http://www.innocenceproject.org/docs/Suffolk_eyewitness.pdf.

[137] *Id.* at 17

[138] Boston Bar Association Task Force, Getting it Right: Improving the Accuracy and Reliability of the Criminal Justice System in Massachusetts (2009), *available at* http://www.bostonbar.org/prs/reports/BBA-Getting_It_Right_12-16-09.pdf. (Hereinafter "BBA Report.") The Task Force members included the former Chief

In pursuing its investigation, the Boston Bar's Task Force recognized that it was not writing on a blank slate – in Massachusetts or elsewhere in the country. Its final report specifically cited Attorney General Reno's technical working group,[139] the Suffolk County Task Force on Eyewitness Evidence,[140] as well as the work of other bar associations, academics, social scientists and policy makers.[141]

The Task Force ultimately issued 23 recommendations[142] for improving eyewitness identification procedures conducted by law enforcement, including the following eight "core" recommendations:

- Obtain and document as complete a description of the suspect as possible;
- Blind administration absent compelling countervailing considerations;
- Prophylactic pre-identification procedure instructions;
- Sequential presentation;
- Confidence statement taken at the time of the identification;
- Documentation of the identification procedure and witness' statement;
- Training programs to ensure that law enforcement understands the recommended procedures;
- Training of the judiciary to ensure understanding of the scientific bases for mistaken identifications and the value of the recommended procedures.[143]

The Report emphasized that it is "critical" that police departments adopt the recommended reform practices as "formal rules or procedures."[144] The Task Force found that formal adoption would serve four important purposes: (1) maximizing the likelihood that best practices will, in fact, be used; (2) ensuring consistent application of best practices to defendants; (3) sending a message to the community that maximizing accurate identifications and minimizing mistaken identifications is a priority; and (4) doing so will bring law enforcement practice in line with what the Task Force anticipates the Supreme Judicial Court will require, directly or indirectly, given the language used by the SJC in *Silva-Santiago*.[145] The Report also noted that, during the course of its work, an informal survey of 27 police departments[146] conducted by the Boston

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Justice of the Appeals Court, senior law enforcement officials, senior state prosecutors, a senior scientist from the Massachusetts State Police Crime Laboratory, a senior attorney from the Massachusetts Executive Office of Public Safety, members of the private bar who have been leaders in the work of the New England Innocence Project, the Chief Counsel for the state's Committee for Public Counsel Service--the state's leader in providing indigent defense--and a number of other lawyers with substantial experience in federal and state criminal defense.

[139] Technical Working Group for Eyewitness Evidence, Eyewitness Evidence: A Guide for Law Enforcement (1999), *available at* https://www.ncjrs.gov/pdffiles1/nij/178240.pdf.

[140] Suffolk County District Attorney's Office, Report of the Task Force on Eyewitness Evidence (2004), *available at* http://www.innocenceproject.org/docs/Suffolk_eyewitness.pdf.

[141] BBA Report at 9, 11.

[142] *Id.* at 20-27.

[143] *Id.* at 4-5.

[144] *Id.* at 19.

[145] *Id.*

[146] In 2008, according to the Bureau of Justice Statistics, Massachusetts had 357 law enforcement agencies. *See* Bryan A. Reaves, U.S. Department of Justice, Census of State and Local Law Enforcement Agencies 15 (2008), *available at* http://www.bjs.gov/content/pub/pdf/csllea08.pdf.

Police Commissioner found that "nearly all of the departments surveyed had adopted at least some of the identification policies recommended by the Department of Justice Guidelines and the Suffolk County Task Force."[147]

The Massachusetts Supreme Judicial Court decision in *Com. v. Silva-Santiago, supra*, involved a challenge to the trial court's denial of Silva-Santiago's motion to suppress two out-of-court identifications by witnesses who were shown simultaneous, eight person photo arrays by investigating detectives who did not give the witnesses prophylactic, pre-lineup instructions, did not take certainty statements at the time of the identification, and did not memorialize the procedures.[148] Beginning with the premise that "[i]t is undeniable that a defendant has a due process right to identification procedures meeting a certain basic standard of fairness,"[149] the court found that the procedures at issue in this case – while far from ideal – did not violate Silva-Santiago's due process rights. The court went on, however, to identify a minimum set of police practices that it "expect[s] to be used in the future."[150] These minimum standards tracked the DOJ's 1999 recommendations:

> What is practicable in nearly all circumstances is a protocol to be employed before a photographic array is provided to an eyewitness, making clear to the eyewitness, at a minimum that: he will be asked to view a set of photographs; the alleged wrongdoer may or may not be in the photographs depicted in the array; it is just as important to clear a person from suspicion as to identify a person as the wrongdoer; individuals depicted in the photographs may not appear exactly as they did on the date of the incident because features such as weight and head and facial hair are subject to change; regardless of whether an identification is made, the investigation will continue; and the procedure requires the administrator to ask the witness to state, in his or her own words, how certain he or she is of any identification.[151]

Two years later, in 2011, the Supreme Judicial Court was presented with *Com. v. Walker, supra*, in which the out-of-court identification procedure did not use any of the reform procedures. (Importantly, the identification procedures occurred in 2001, predating the court's decision in *Silva-Santiago* and the two bar association reports.) In *Walker*, investigating officers (i.e., non-blind administrators) showed a witness to a shooting an eight-person, all suspect, simultaneous

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[147] *Id.* at 18. Over the past three years, the Massachusetts Chiefs of Police Association and the New England Innocence Project conducted a joint survey of eyewitness identification policies among Massachusetts law enforcement agencies. To date, 72 percent of departments responded to their inquiry; of those responding 56 percent had complete written policies that could be analyzed. Eleven percent of reporting agencies had no written policy. Of the policies analyzed, the survey found that, for each specific reform, the majority of departments require or recommend that reform.

[148] 906 N.E. 299, 306-07 (2009).

[149] *Id.* at 310, *quoting Com. v. Dougan* 386 N.E.2d 1 (1979).

[150] *Id.* at 312.

[151] *Id.* at 312, *citing* United States Department of Justice, Eyewitness Evidence: A Guide for Law Enforcement 19, 31–34 (1999).

photographic array.[152] The witness was not provided with any prophylactic, pre-lineup instructions, nor was he asked to provide a confidence statement at the time of the identification. While the court ultimately concluded that the trial court's admission of the identification was not improper, the court took a highly unusual step, creating an eyewitness study committee:

> Because eyewitness identification is the greatest source of wrongful convictions but also an invaluable law enforcement tool in obtaining accurate convictions, and because the research regarding eyewitness identification procedures is complex and evolving, we shall convene a study committee to consider how we can best deter unnecessarily suggestive procedures and whether existing model jury instructions provide adequate guidance to juries in evaluating eyewitness testimony.[153]

The Supreme Judicial Court Study Group on Eyewitness Evidence submitted its Report and Recommendation to the Justices on July 25, 2013 (the "SJC Report"). The Supreme Judicial Court held an open comment period through January 27, 2014[154] and has not yet reached a decision about how it will handle the Study Group's recommendations.

As the Committee heard at its first meeting, the Study Group was chaired by the Honorable Robert J. Kane, Associate Justice of the Superior Court Department. The Study Group consisted of "judges, prosecutors, defenders law enforcement personnel and academics experienced in matters of criminal law and procedure."[155]

> The Study Group undertook its work mainly in three subcommittees. The Police Practices Subcommittee explored whether the Supreme Judicial Court should require police protocols in eyewitness identification procedures beyond those required in *Commonwealth v. Walker*, 460 Mass. 590, 603-604 (2011), and *Commonwealth v. Silva-Santiago*, 453 Mass. 782, 798 (2009), and what consequences are appropriate for the failure of police to adhere to these protocols. The Hearing Subcommittee examined whether pretrial evidentiary hearings should be conducted where the reliability of a pretrial identification is challenged for reasons other than an unnecessarily suggestive identification procedure caused by police and private conduct, and, if so, what remedy, if any, is appropriate. The Jury Instructions Subcommittee considered whether existing model jury instructions adequately assist juries in evaluating eyewitness testimony and, if not, what instructions would better assist juries and whether

[152] 953 N.E.2d 195, 207-08 (Mass. 2011).
[153] *Id.* at 208, n.16.
[154] The Innocence Project submitted comments to the Massachusetts Supreme Judicial Court on the SJC Report, which we attach hereto as Appendix D.
[155] SJC Report 1.

> revised jury instructions would reduce the need for expert testimony.[156]

Each subcommittee issued a report, detailing their deliberations, areas of agreement and disagreement, and recommendations for improvement in each area. The Report was based on an extensive review of the scientific research on eyewitness identification and the Study Group concluded that "there is now general scientific consensus on many areas affecting eyewitness identification, consensus that requires a change in the way courts, counsel and police deal with the evidence."[157] The Study Group ultimately issued five recommendations:

> 1. The Supreme Judicial Court should "take judicial notice as legislative facts of the modern psychological principles regarding eyewitness memory set out in" *Lawson*.[158]
>
> 2. Police departments should adopt uniform statewide procedures – identified as best practices[159] by the Study Group – for conducting all identification procedures. The Study Group identified a subset of these best practices which "carr[y] a likelihood of tainting an eyewitness identification"[160] and, if not followed in a substantial way, could form the basis for a pretrial evidentiary hearing.[161] Finally, the Study Group strongly recommended that police agencies conduct comprehensive, mandatory training on the best practices and their scientific support.
>
> 3. Pretrial judicial inquiry into the reliability of eyewitness evidence and remedies available for admitted evidence should be expanded.
>
> 4. Revised, expansive, science-based jury instructions (drafted by the Study Group) should be adopted. Judges and attorneys should be trained to properly implement the revised instructions and the instructions should be periodically reviewed to "reflect changes in the science of eyewitness identification."[162] A "majority of the Study Group

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[156] *Id.*
[157] *Id.*
[158] *Id.* at 2.
[159] *Id.* at 87-88.
[160] *Id.* at 89. ("The best police practices listed below should become standard operating procedures at all Massachusetts law enforcement agencies. Failure to adhere to these specific protocols carries a likelihood of tainting an identification by an eyewitness. A substantial failure in any category should warrant a hearing." These mandatory best practices are: 1. Offender descriptions should not be taken from an eyewitness in the presence of another eyewitness; 2. A showup should not be conducted more than approximately 2 hours after the offense; 3. Showups should not be conducted with the suspect in a police cruiser or visibly handcuffed; 4. If showups are conducted with multiple witnesses, each witness should not be able to see or hear the procedure or results of the other showups; 5. for photographic arrays or lineups, fillers should match the offender's description; a suspect should not stand out; minimum five fillers; one suspect per array/lineup; fillers should not be repeated with the same witness; 6. Prior to conducting an identification procedure, police should give prophylactic pre-lineup instructions that inform the witness that the perpetrator may or may not be present; it is equally important to clear innocents as to identify the wrongdoer; individuals may not appear exactly as they did at the time of the crime; the investigation will continue whether or not an identification is made; the procedure requires the witness to make a certainty statement; 7. Blind or blinded administration; 8. Sequential presentation; 9. If a witness makes an identification, police should immediately seek a confidence statement.)
[161] *Id.* at 47.
[162] *Id.* at 4.

> recommends that [the revised instructions] are not a substitute for expert testimony on eyewitness identification."[163]
>
> 5. The Supreme Judicial Court should create a Standing Committee or Committees on Eyewitness Identification in order to "develop professional training for judges and lawyers on the new procedures, to ascertain the effect that adopted recommendations will have on criminal adjudications, and to monitor developments in the science that may require modification of eyewitness identification procedures and protocols from time to time."[164]

Each of these recommendations is supported by the scientific research and is critical to ensuring an improvement in the reliability of eyewitness identification evidence that is collected and used in Massachusetts. The Study Group should be particularly commended for its recognition of the interdependency of each of the areas they examined – police procedures; pretrial hearings; intermediate remedies – and, especially the need for ongoing training and examination of available tools to ensure that they remain current with respect to the scientific research. Perhaps most striking, however, is the Study Group's approach to the expanded judicial gatekeeping role for all identifications, not just those that result from unnecessarily suggestive procedures.

In formulating its approach to pretrial hearings, the Study Group – and in particular the Hearing Subcommittee – examined the approaches taken in *Henderson* and *Lawson* as well as the scientific research. Both judicial approaches influenced the "Massachusetts Approach" ultimately adopted by the Study Group.[165] The Study Group's principle concern with *Henderson* was that its approach to hearings – that they would be triggered by "some showing of suggestiveness" by the defendant – was "so over-inclusive as to trigger pretrial evidentiary hearings in a very high percentage of cases."[166] The Study Group had two principle concerns with *Lawson*: first, it found that the decision's placement of the burden of production on the prosecution was "incompatible with existing Massachusetts due process standards"[167] and second, it found that, by "treating all sources of reliability alike,"[168] the *Lawson* decision "runs the risk of weakening a defendant's due process rights concerning police conduct."[169] Finally, the Study Group ultimately found that it was beyond its Charter to recommend the kind of change embraced by *Lawson*.[170]

Under that approach, a defendant is entitled to a pretrial evidentiary hearing when:

> (i) the defendant makes a preliminary showing of an unnecessarily suggestive identification procedure (the current standard); or (ii) the defendant makes a showing that a witness was involved in a highly suggestive confrontation with the defendant independent of

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[163] *Id.*
[164] *Id.*
[165] *Id.* at 47.
[166] *Id.* at 43.
[167] *Id.* at 45.
[168] *Id.* at 46.
[169] *Id.*
[170] *Id.*

> any police involvement, *see Commonwealth v. Jones*, 423 Mass. 99 (1996); or (iii) that the police failed to follow certain specific best police practices on eyewitness identification in a substantial way in conducting or arranging a pretrial identification procedure; or (iv) when the pretrial eyewitness identification is uncorroborated and the defendant makes a showing of the presence of estimator variables casting doubt on the reliability of the identification.[171]

The Massachusetts Approach is an interesting alternative to those articulated in *Henderson/Chen* and in *Lawson*. Like *Henderson/Chen* and *Lawson*, the Massachusetts Approach contemplates hearings for state-orchestrated suggestion and suggestive behavior by private actors. It goes further, however, by specifically finding that hearings should be had when police fail to substantially comply with certain best practices or, in estimator variable-only cases, where there is no corroborating evidence. While nothing in either *Henderson/Chen* or *Lawson* prohibits hearings based on these triggering events, we believe that the absence of an affirmative statement that hearings should be granted under these circumstances may make lower courts more reluctant to do so. At the same time, there is a concern that hearings for reasons not specifically articulated by the Massachusetts Study Group (and perhaps not considered) may be rejected by lower courts who view the reasons set forth in the SJC Report as exhaustive.

Lessons from New Jersey, Oregon and Massachusetts

We view the varied experiences of New Jersey, Oregon and Massachusetts as a sign that eyewitness identification reform can happen in any state with no required preconditions to reform. While New Jersey and Massachusetts both had extensive histories of judicial and law enforcement interest in addressing the vulnerabilities of eyewitness identification evidence and improving the collection of that evidence, Oregon had neither before its supreme court decided *Lawson*. What we can say is necessary is a judiciary that is willing to either review, or direct a review, of the scientific research findings about eyewitness memory and perception and consider how, within its state's own unique legal framework and culture, the scientific findings may be incorporated. The experiences of the three states demonstrate that a court can choose to adopt a new science-based legal architecture as a state constitutional or state evidentiary matter – or as a hybrid approach. Finally, in each case the courts properly recognized the need for any new legal architecture to remain open to developments in scientific research and to develop mechanisms for ongoing evaluation of the scientific research so that, when new findings reach a level of general acceptance, they can be incorporated into the legal architecture without delay.

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[171] *Id.*

CONCLUSION

Given the role of eyewitness misidentifications in wrongful convictions, the Innocence Project is extremely grateful to the Laura and John Arnold Foundation for funding this Committee, and to the Committee members who have committed to address very important issues of science and law. We hope that the Committee's final report will offer a comprehensive roadmap for stakeholders across the nation to improve the collection and use of eyewitness identification evidence in criminal cases, while identifying those areas where additional scientific research is necessary. The Committee's report holds great promise for improving the reliability of critical evidence in future criminal investigations and trials, an outcome that will substantially reduce the number of wrongful convictions based on eyewitness misidentification and significantly enhance public safety.

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The Relationship Between Eyewitness Confidence and Identification Accuracy: A New Synthesis

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Summary
The U.S. legal system increasingly accepts the idea that the confidence expressed by an eyewitness who identified a suspect from a lineup provides little information as to the accuracy of that identification. There was a time when this pessimistic assessment was entirely reasonable because of the questionable eyewitness-identification procedures that police commonly employed. However, after more than 30 years of eyewitness-identification research, our understanding of how to properly conduct a lineup has evolved considerably, and the time seems ripe to ask how eyewitness confidence informs accuracy under more pristine testing conditions (e.g., initial, uncontaminated memory tests using fair lineups, with no lineup administrator influence, and with an immediate confidence statement). Under those conditions, mock-crime studies and police department field studies have consistently shown that, for adults, (a) confidence and accuracy are strongly related and (b) high-confidence suspect identifications are remarkably accurate. However, when certain non-pristine testing conditions prevail (e.g., when unfair lineups are used), the accuracy of even a high-confidence suspect ID is seriously compromised. Unfortunately, some jurisdictions have not yet made reforms that would create pristine testing conditions and, hence, our conclusions about the reliability of high-confidence identifications cannot yet be applied to those jurisdictions. However, understanding the information value of eyewitness confidence under pristine testing conditions can help the criminal justice system to simultaneously achieve both of its main objectives: to exonerate the innocent (by better appreciating that initial, low-confidence suspect identifications are error prone) and to convict the guilty (by better appreciating that initial, high-confidence suspect identifications are surprisingly accurate under proper testing conditions).

Keywords
calibration, confidence and accuracy, eyewitness identification, eyewitness memory, lineups, wrongful convictions

Introduction

In his book *On the Witness Stand: Essays on Psychology and Crime*, Hugo Münsterberg (1908) warned about the unreliability of eyewitness memory. As it turns out, he was prescient. Since 1989, 349 wrongful convictions have been overturned through DNA testing, and eyewitness misidentification played a role in over 70% of those cases—far more than any other contributing cause (Innocence Project, 2016). No one doubts that the large majority of these misidentifications were made in good faith. Somehow, these eyewitnesses came to honestly but mistakenly believe that the innocent defendant was the person who committed the crime. How did that happen? The short explanation is that the procedures used for testing eyewitness identification were not developed and validated in the scientific laboratory before being implemented in the field. Instead, they were developed

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within the criminal justice system and implemented under the mistaken assumption that they accurately identified the guilty without unduly jeopardizing the innocent.

When experimental psychologists began to empirically investigate the validity of these identification procedures in the 1970s and 1980s, they soon discovered that many seemed tailor-made for eliciting high-confidence misidentifications. For example, nowadays, a typical photo-lineup identification procedure consists of the simultaneous or sequential presentation of one photo of the suspect (the person the police believe may have committed the crime) and five or more fillers (photos of people who are known to be innocent but who physically resemble the suspect). Such a lineup offers protection to an innocent suspect because a witness who chooses randomly is far more likely to land on a filler than the suspect. However, before the dangers of eyewitness misidentification were understood, an investigating officer might present a lineup consisting of only suspects (with no fillers) and tell a witness who had just identified one of the suspects with low confidence that it was clearly the right decision, resulting in a higher expression of confidence the next time the witness was asked about it. By the time of the trial, the jury would see the witness honestly misidentify the suspect with high confidence and convict on that basis alone, often sending an innocent person to prison. Practices like these help to explain why, in every one of the DNA exoneration cases involving eyewitness misidentification examined by Garrett (2011), witnesses who mistakenly identified innocent defendants did so with high confidence when the case was tried in a court of law.

But what about the confidence expressed by an eyewitness tested using the scientifically validated procedures that have been developed over the years by eyewitness-identification researchers? That is the question we focus on here, and the answer will undoubtedly come as a surprise to many. Understandably, the disproportionate role played by eyewitness misidentification in the DNA exoneration cases has helped to create a widespread impression that eyewitness memory is unreliable even under the best of circumstances (i.e., that it is *inherently* unreliable). But over the last 20 years, eyewitness-identification researchers have discovered that when eyewitnesses are tested using appropriate identification procedures, the confidence they express can be, and usually is, a highly reliable indicator of accuracy (Brewer & Wells, 2006; Juslin, Olsson, & Winman, 1996). However, over that same period of time, the legal system has increasingly come to interpret the scientific literature as indicating no meaningful relation between confidence and accuracy. As a result, some courts now advise juries to disregard eyewitness expressions of confidence and to focus instead on a variety of other factors when trying to assess the reliability of an ID. The purpose of our article is to explain why a blanket disregard for eyewitness confidence not only is at odds with what has been learned in recent years but also can contribute both to the wrongful conviction of innocent suspects and to the unwarranted removal from suspicion of a guilty suspect.

Our article is organized as follows: We first document a growing trend within the legal system to disregard eyewitness confidence, with no distinction drawn as to whether the eyewitness-identification procedures were appropriate or not and with no distinction drawn between witness confidence at the time of the initial identification versus witness confidence at a later time. Next, we review a recommended set of appropriate ("pristine") identification procedures that have been developed in eyewitness-identification laboratory studies and how these pristine procedures can operate to prevent other factors from contaminating eyewitness confidence. The general idea is that a strong relation between confidence and accuracy is the natural state of affairs, but there are various things that can contaminate that relation. We then consider the nontrivial issue of how best to measure the confidence-accuracy relationship, followed by a detailed review and reanalysis of the empirical literature on the confidence-accuracy relation. The results will show that when pristine identification procedures are used, eyewitness confidence is a highly informative indicator of accuracy, and high-confidence suspect identifications are highly accurate. We go on to demonstrate that the confidence-accuracy relationship can be compromised when certain non-pristine identification procedures are used, and we enumerate priorities for future research on the confidence-accuracy relationship.

How Eyewitness Confidence Is Understood in the Legal System

In the legal system, eyewitness confidence is increasingly distrusted. For example, the state of New Jersey recently adopted jury instructions declaring that "although some research has found that highly confident witnesses are more likely to make accurate identifications, eyewitness confidence is generally an unreliable indicator of accuracy" (New Jersey Courts, 2012a; New Jersey Courts, 2012b). The report upon which the New Jersey instructions were based (Report of the Special Master, *State v. Henderson*, 2011) categorically asserted that "studies uniformly show, and the experts unanimously agree, that confidence is not closely correlated to accuracy" (p. 79). When discussing confidence, no distinction was drawn between identification procedures that are pristine and

those that are not. These jury instructions are, of course, accurate when applied to problematic eyewitness-identification procedures, but our question concerns the confidence-accuracy relationship when pristine procedures are used early in the investigation and prior to any memory contamination. As our review will demonstrate, there are known conditions under which confidence clearly informs accuracy and other known conditions under which it clearly does not.

A bleak view of eyewitness confidence is not in any way limited to New Jersey. Other jurisdictions have revised their jury instructions so as to encourage juries to place little faith in eyewitness confidence. In Massachusetts, for example, the relevant instructions stipulate that "a witness's expressed certainty in an identification, standing alone, may not be a reliable indicator of the accuracy of the identification, especially where the witness did not describe that level of certainty when the witness first made the identification" (Massachusetts Court System, 2015, pp. 5–6). These instructions appropriately focus on the importance on the initial identification, but they do not appropriately communicate the high information value of an initial statement of confidence obtained from a pristine identification procedure.

Next, consider this recent statement made by the Connecticut Supreme Court in *State v. Guilbert* (2012): "Courts across the country now accept that there is at best a weak correlation between a witness's confidence in his or her identification and its accuracy." In a subsequent case, the Connecticut Psychological Association filed an amicus brief with the state supreme court arguing that eyewitness confidence is so loosely correlated with accuracy that it should no longer serve as a criterion for evaluating the reliability of eyewitness identification (Berard, 2014). No distinction was made between the confidence of the witness at the time of identification and the confidence of the witness at trial. Similarly, in *Brodes v. State* (2005), the Georgia Supreme Court held that jury instructions should not encourage jurors to consider a witness's confidence when trying to determine the reliability of an ID, specifically citing scientific research on the correlation between confidence and accuracy:

> In light of the scientifically-documented lack of correlation between a witness's certainty in his or her identification of someone as the perpetrator of a crime and the accuracy of that identification, and the critical importance of accurate jury instructions as "the lamp to guide the jury's feet in journeying through the testimony in search of a legal verdict," we can no longer endorse an instruction authorizing jurors to consider the witness's certainty in his/her identification as a factor to be used in deciding the reliability of that identification. Accordingly, we advise trial courts to refrain from informing jurors they may consider a witness's level of certainty when instructing them on the factors that may be considered in deciding the reliability of that identification.

Again, no distinction was made by the court between the confidence of the witness at the time of identification and the confidence of the witness at trial. Along the same lines, in *State v. Mitchell* (2012), the Utah Supreme Court recently stated,

> In the end, we agree with the Connecticut Supreme Court that the available studies are not definitive on the question whether there is a significant correlation between certainty and accuracy. But we are also mindful that the literature suggests certainty may not always be as reliable an indicator of accuracy. . . Therefore, we hold it is error to instruct the jury on the degree of certainty factor, and we discourage its future use.

Undeniably, eyewitness certainty at pretrial hearings or at trial should be highly suspect for reasons we will discuss. But when a lineup is conducted under pristine testing conditions and the confidence statement of the witness is taken at the time of identification, the data indicate that confidence is a reliable indicator of accuracy.

The fact that courts increasingly distrust eyewitness confidence is not altogether surprising, given that expert witnesses and concerned organizations routinely paint a gloomy picture of the confidence-accuracy relationship. For example, a 2013 amicus brief filed by the Innocence Project said, "A witness's confidence bears, at best, a weak relationship to accuracy" (Innocence Project, 2013, p. 11). However, the evidence we will review suggests that "at best" (i.e., under pristine conditions), a witness's confidence bears a strong relationship to accuracy.

It is not just the Innocence Project that has a generally pessimistic view of the confidence-accuracy relationship. A recent amicus brief filed by the American Psychological Association painted a similarly bleak picture of the situation:

> . . . as one study explained, "[t]he outcomes of empirical studies, reviews, and meta-analyses have converged on the conclusion that the confidence-accuracy relationship for eyewitness identification is weak, with average confidence-accuracy correlations generally estimated between little more than 0 and .29." . . . Another slightly older analysis. . . has suggested a confidence-accuracy correlation of

> only 0.41 for certain types of identifications. . . Importantly, error rates can be high even among the most confident witnesses. Researchers have performed studies that track, in addition to identification accuracy, the subjects' estimates of their confidence in their identifications. In one article reporting results from an empirical study, researchers found that among witnesses who made positive identifications, as many as 40 percent were mistaken, yet they declared themselves to be 90 percent to 100 percent confident in the accuracy of their identifications. . . . This confirms that many witnesses are overconfident in their identification decisions. (American Psychological Association, 2014, pp. 17–18)

Claims like this do not accurately inform the legal system. If these claims of an untrustworthy confidence-accuracy relation had been restricted to specific non-pristine testing conditions that have been shown to compromise the information value of eyewitness confidence or to confidence statements taken later rather than at the time of the initial identification, then they would be defensible claims.

One of the key points we will emphasize is that the only time that confidence is known to be a highly reliable predictor of accuracy is when memory is first tested, before there is much opportunity for memory contamination to occur. An expression of low confidence on that first test is a glaring red flag because it is almost always an indication that the risk of error is high. Instead of being ignored, an initial expression of low confidence should take center stage—overshadowing all other considerations—when a jury's goal is to evaluate the reliability of a suspect ID. If the witness is assumed to be honest, and if the ID was made with low confidence, then it is an unreliable ID. In fact, most of the DNA exonerees who were misidentified by an eyewitness were, at the outset of the investigation, identified with low confidence (Garrett, 2011). It was only later, in court and in front of the jury, that the initial low-confidence ID somehow morphed into a high-confidence ID. If it had been understood that confidence is indicative of accuracy only on an initial memory test (i.e., that on an initial test, low confidence implies low accuracy and high confidence implies higher accuracy), then many of these wrongfully convicted individuals may never have been found guilty in the first place. Or, if prosecutors had understood that low confidence at the initial identification is indicative of a high risk of error, then the innocent suspects in these cases might not have been indicted in the first place. Thus, far from being a problem, *initial* eyewitness confidence is part of the solution to eyewitness-based wrongful convictions (Box 1).

Box 1. Jennifer Thompson's Misidentification of Ronald Cotton



During a trial that was held in 1985, Jennifer Thompson confidently identified Ronald Cotton as the man who had raped her. Cotton was convicted largely on the basis of her testimony, but he was later exonerated by DNA evidence after spending more than 10 years in prison. Long before the trial, however, Thompson's *initial* identification of Cotton from a photo lineup was characterized by a prolonged period of hesitation and indecision that lasted for nearly 5 minutes and ended with a low-confidence verbal identification consisting of the words "I think this is the guy" (Thompson-Cannino, Cotton, & Torneo, 2009, p. 33; Garrett, 2011). However, after confirmatory feedback from the police, Thompson became increasingly confident that Cotton was the rapist. From this perspective, the mistake was to rely on confidence expressed at the time of the trial (after it had become improperly inflated) instead of relying on confidence expressed at the time of the initial ID (before memory contamination had a chance to play a significant role). Indeed, in a very real way, it was the legal system—not Jennifer Thompson—that made the key mistake by ignoring her initial (low) confidence. From this perspective, the time has come to exonerate her, too.

To appreciate how important it is to take into account (not ignore) an initial expression of low confidence by an eyewitness, imagine an eyewitness-identification case involving an innocent suspect that is adjudicated using an approach in which eyewitness confidence is ignored but various factors known to affect eyewitness memory are taken into consideration by a jury. Many of these factors are *estimator variables*—that is, variables that affect memory but are outside of the control of the legal system (Wells, 1978). Some common estimator variables include:

1. Race (cross-race IDs are less accurate than same-race IDs)
2. Exposure duration (brief exposure results in worse memory for the perpetrator than longer exposure)
3. Lighting (poor lighting during the crime results in worse memory for the perpetrator than good lighting)
4. Retention interval (a longer duration between the witnessed crime and the first lineup test results in worse memory for the perpetrator than a shorter duration)
5. Stress (high stress can lead to worse memory for the perpetrator than low stress)
6. Weapon focus (memory for the perpetrator is worse when a weapon is present than when no weapon is present)

For this hypothetical case involving an innocent suspect identified by an eyewitness, assume that all of these factors were favorable. For example, assume it was a same-race ID, exposure duration was long, the lighting was good, the retention interval was short, the witness was not particularly stressed, and no weapon was present. Under such conditions, the jury might reasonably conclude that the eyewitness-identification evidence is reliable and find the innocent suspect guilty. Now imagine that, unbeknownst to the jury, the witness expressed low confidence when the ID was initially made—because the innocent suspect was not a particularly good match to the witness's memory. The evidence we will review shows that such an ID is highly error prone despite the fact that all of the estimator variables are such that one might reasonably conclude otherwise. A low-confidence initial ID *trumps these good witnessing conditions* when evaluating the reliability of eyewitness-identification evidence. For that reason, ignoring initial confidence can place innocent suspects at risk.

Whereas low-confidence initial IDs always signal low accuracy—whether the identification procedure was pristine or not—high-confidence IDs on an initial test generally signal high accuracy when pristine testing conditions were used. Thus, initial confidence can serve the cause of justice by protecting the innocent (because initial IDs made with low confidence are untrustworthy) and imperiling the guilty (because initial IDs made with high confidence are trustworthy given appropriate testing conditions). That being the case, it is important to consider what has been learned about the proper way to conduct an eyewitness-identification test.

What Are the Pristine Eyewitness-Identification Procedures?

The error-prone nature of high-confidence eyewitness identifications made in a court of law—after memory has been contaminated—should no longer come as a surprise. All forensic tests—even DNA tests—have the potential to be unreliable if improper testing procedures are used. Proper procedures for obtaining reliable DNA test results were worked out by scientists in the laboratory before they were ever implemented in the forensic domain. As noted earlier, the same cannot be said of eyewitness-identification procedures. Since the 1970s, however, eyewitness-identification researchers have made considerable progress in working out more effective ways of testing eyewitness memory.

A general framework for improving eyewitness-identification procedures was described by Wells and Luus (1990), who proposed the "lineups-as-experiments" analogy. In this analogy, the officer conducting the lineup is like an experimenter; the eyewitnesses are the subjects; instructions to the eyewitnesses can be likened to an experimenter's protocol; the suspect is a stimulus; and the selection of lineup members and the positioning of the suspect in the lineup are part of the design. In addition, police have a hypothesis (e.g., that #4 is the guilty party) and have created a design and procedure to test the hypothesis. The eyewitnesses' choices or identification behaviors constitute the data from which the validity of that hypothesis will be evaluated by police and possibly a prosecutor, judge, and jury.

The idea behind the lineups-as-experiments analogy is that steps that have been taken to enhance the validity of scientific experiments can be applied to police lineup procedures to achieve the same goal. As one example, according to standard laboratory practice, the experimenter is blind to the experimental condition to avoid unconscious biases that might otherwise skew the results in favor of the experimenter's hypothesis. In a police lineup, the "experimenter's" hypothesis is that the suspect is the perpetrator; it therefore stands to reason that the officer administering the lineup should be blind to who the suspect is to avoid unintentionally steering the witness to the suspect. This practice is known as a *double-blind* lineup procedure because neither the lineup administrator nor the witness is told in advance who the suspect in the lineup is. Thus, if the suspect is identified by the witness, one can be more confident that the ID was based on the memory of the witness compared to when a non-blind test is administered.

Another important conceptual distinction to keep in mind is the difference between *system variables* and estimator variables (Wells, 1978). Most eyewitness-identification research has focused on system variables, which are factors affecting the reliability of eyewitness identifications that the criminal justice system can control. As noted earlier, estimator variables are factors that can affect the reliability of an identification but are outside the control of the criminal justice system (e.g., duration of exposure to the perpetrator, the retention interval

between the witnessed crime and the first memory test, the presence or absence of a weapon). The main system variable we focus on here concerns how a lineup is administered. Research on lineups has led to a number of recommendations for enhancing the reliability of eyewitness IDs and, critically, for creating the conditions under which confidence is a reliable indicator of accuracy. We review those system-variable recommendations below. Although estimator variables cannot be controlled by the time a crime comes to the attention of the police and thus do not bear on the issue of how to conduct a pristine identification procedure, eyewitness confidence may be an important consideration with respect to those variables as well. Later, following our review of the empirical evidence on the confidence-accuracy relationship, we briefly consider the issue of eyewitness confidence and estimator variables. Here, we consider five system-variable recommendations for the pristine conduct of an eyewitness-identification procedure that were put forward in a white paper of the American Psychology-Law Society and Division 41 of the American Psychological Association (Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998).

Include only one suspect per lineup

A lineup should contain only one suspect, with the remaining persons being known-innocent fillers. The typical recommendation is that a lineup should contain at least five known-innocent fillers (National Institute of Justice, 1999). In the parlance of the lineups-as-experiments analogy, the use of known-innocent fillers can be construed as a method of controlling for guessing. Using an all-suspect lineup, a witness who is prone to simply pick someone will always manage to land on a suspect, and charges might be brought against that person. The dangers of all-suspect lineups have long been documented in the eyewitness-identification literature (Wells & Turtle, 1986). In effect, a lineup that contains only suspects (no fillers) is like a multiple-choice test with no wrong answer. A proper lineup should be constructed in such a way that the witness can "fail" by selecting a filler.

Although fundamental and seemingly elementary, this safeguard against mistaken identification was once commonly violated and is still too often violated today. In fact, in the case of Ronald Cotton and Jennifer Thompson (see Box 1), the photo lineup shown to Thompson was an all-suspect lineup from which she tentatively identified Cotton. This was followed later by a live lineup in which Cotton was the only suspect and the remaining members were fillers. Of course, the actual perpetrator, Bobby Poole, was not in either lineup. The one-suspect recommendation applies under all circumstances. For instance, if there are multiple suspects even though there was only one offender, each suspect should appear in his or her own lineup along with fillers selected for that lineup. If there were multiple offenders, each suspect should still appear in his or her own lineup.

The suspect should not stand out in the lineup

Merely having fillers in a lineup is not in itself a guarantee that they will serve their function of helping to prevent mistaken identifications. Consider, for instance, a case in which the eyewitness described the offender as being a tall, thin male with dark hair and a moustache. Suppose now that the suspect fits this description but some fillers in the lineup are short, others do not have moustaches, and others have light hair. In this case, the suspect will stand out to the witness as being the person who looks most like the offender relative to the other lineup members, regardless of whether the suspect is the actual offender or not. This is the classic idea of a biased lineup. Research shows that placing an innocent suspect who fits the description of the offender in a lineup in which the fillers do not fit the description results in a high rate of mistaken identifications of that person, even when absolute similarity between the innocent person and the offender is only moderate. Moreover, there is evidence for what has been called the *dud effect*, in which adding fillers who look nothing like the perpetrator ("duds") to a lineup increases the confidence with which witnesses choose an innocent person who resembles the perpetrator (Charman, Wells, & Joy, 2011). One way to test whether the fillers are serving their purpose of helping to protect against mistaken identification is to ask whether a non-witness could pick the suspect out from the lineup by merely knowing the description that the eyewitness gave of the offender or by identifying who stands out in the lineup. If the answer is "yes," the fillers are not serving their purpose in the lineup. Indeed, this is the foundation of the "mock witness test" that was developed in the early days of eyewitness-identification research for analyzing the fairness of lineups (Wells, Leippe, & Ostrom, 1979).

Biased lineups are such a severe threat to our ability to rely on the confidence of the witness to infer accuracy that it is important that we give this issue a bit more treatment. One kind of situation that can place an innocent suspect at risk of being mistakenly identified with high confidence is coincidental resemblance between the innocent suspect and the actual perpetrator. Even if all the lineup fillers fit the witness's verbal description of the perpetrator, coincidental resemblance will make an innocent suspect stand out, and empirical studies have shown

that unusual resemblance of this type leads to mistaken identifications and high confidence (R. C. L. Lindsay, 1986). We cannot rule out the possibility of coincidental resemblance. But the fact that it is coincidental suggests that it is likely to be extremely rare. In fact, we have found no DNA exoneration case thus far that seems to qualify as having been an example of coincidental resemblance (if by coincidental resemblance we mean that the resemblance was due merely to chance).

On the other hand, unusual resemblance can occur (and has occurred) between an innocent suspect and the perpetrator for reasons other than coincidence. For example, police sometimes use sketch artists or software programs with which witnesses attempt to create a likeness of the perpetrator's face for the purpose of finding possible suspects. In general, if the witness makes a good composite and the composite is then used to find a suspect, the suspect is going to show a strong resemblance to the perpetrator even if the suspect is not the perpetrator. Hence, if the composite is used to find a suspect but the fillers are selected based on the broad verbal description given by the witness, the suspect will stand out (see Box 2).

Box 2. A Striking Resemblance: The Mistaken Identification of Michael McAlister



After spending 29 years in prison for a sexual assault that he did not commit, Michael McAlister was exonerated in 2015. The real perpetrator (on the left) was a serial rapist who bore a striking resemblance to McAlister and the only trial evidence linking McAlister to the attack was the victim's eyewitness identification and testimony. The McAlister case is an example of unusual similarity that, we argue, is not simply a coincidence. McAlister became the suspect in the case based on a facial composite sketch developed with the assistance of the victim witness. If an innocent person becomes a suspect based on their resemblance to a composite sketch (or a surveillance image), there is a heightened risk that the innocent person will have unusual resemblance to the eyewitness's memory of the actual perpetrator. In these cases, the lineup fillers need to be selected based on the fact that they also resemble the composite so as to make sure that the suspect does not stand out in the lineup.

Another way in which an innocent suspect might have unusual similarity to the perpetrator is when surveillance images (e.g., from a convenience store camera) are used to produce a suspect. With the increasing prevalence of electronic surveillance devices in public places, this path to becoming a suspect is likely to be increasingly common. Interestingly, people are quite poor at being able to accurately match a stranger to a surveillance image, even for high-quality images (e.g., see Davis & Valentine, 2009). But the process of using a surveillance image to decide who might be a suspect is rather certain to lead to an individual who is highly similar to the perpetrator, even if the person is innocent. Hence, if an innocent person becomes a suspect and is placed in a lineup based on his or her similarity to a surveillance image, then there is likely to be unusual similarity between the innocent suspect and the eyewitness's memory of the perpetrator, which could lead to a high-confidence (but mistaken) identification.

Notice that this surveillance-image path to high similarity is like the composite example; the high similarity did not occur purely by chance, and therefore it is not coincidental resemblance. And that point is key to solving the problem of unusual similarity when similarity arises from composites or from surveillance images. The solution here is contained in the strategy for selecting fillers for a lineup. Recall that the overall idea for selecting good fillers for a lineup is to make sure that the suspect does not stand out based on what is already known about the perpetrator. For example, if the witness described the perpetrator as being a White male, mid-20s in age, slim build, clean shaven, with short dark hair, and investigators find a suspect with those characteristics, then all of the lineup fillers also need to fit that description. If a composite or surveillance image of the perpetrator was used to find a suspect, however, the composite or surveillance image should trump the verbal description as the criterion for selecting fillers. In other words, if an individual became the suspect based on his or her similarity to a composite or a surveillance image, then the fillers need to also be selected based on their similarity to the composite or surveillance image. Yes, the suspect will still have unusual similarity to the perpetrator even if the suspect is innocent, but so will the fillers. As a result of this strategy for selecting lineup fillers, an innocent suspect should not stand out, thereby controlling the chances of a mistaken identification and false confidence.

Caution that the offender might not be in the lineup

Eyewitnesses often approach lineups with the goal of finding the offender. They should be cautioned that the offender might not be in the lineup because they need to understand that they are not "failing" if they do not choose

someone; after all, the correct answer might be "none of the above." In fact, "none of the above" was the correct answer not only in the case of Ronald Cotton and Jennifer Thompson, but also in all the other mistaken-identification cases that have been overturned by DNA testing. The instruction that the perpetrator might not be in the lineup is commonly called the *pre-lineup admonition.*

One concern about the pre-lineup admonition is that it might be undermined by suggestions that occur well before the lineup procedure commences. Quinlivan et al. (2012) found that suggestions to eyewitnesses leading them to believe that the perpetrator would be in the lineup prior to the commencement of the lineup instructions largely canceled the effect of the pre-lineup admonition. This, in turn, increased mistaken identifications in perpetrator-absent lineups and increased the confidence that witnesses had in those mistaken identifications. Consider, for example, an investigator contacting an eyewitness and saying, "We got the guy. We just need for you to come pick him out of a lineup." It seems quite likely that, as Quinlivan et al. found, this suggestion would largely cancel the pre-lineup admonition that would be given later when the formal lineup procedure begins.

Suggestions that occur prior to the commencement of a lineup procedure are concerning because they might be difficult to control. When jurisdictions have adopted pristine eyewitness-identification procedures, those procedures have typically covered only the official commencement of the pre-lineup instructions. Workable solutions to the potential problem of suggestions occurring prior to the initial identification have not been developed; we mention it here simply to raise awareness of it. Although the degree to which it is an actual problem is unknown, it seems reasonable to suppose that it could become more of a problem once the information value of initial eyewitness confidence becomes more widely appreciated. Thus, for the time being, we simply encourage vigilance against this possible contaminating factor.

Use double-blind testing

As noted above, the person who administers a lineup should not know which person in the lineup is the suspect. The use of such double-blind procedures is common in the social and medical sciences. Consider, for instance, the use of placebo control conditions in testing new drugs. Not only is the patient unaware of whether he or she received the drug or a placebo (single-blind), but so are any medical personnel who examine the patients (hence, the term *double-blind*). In this context, "blind" is figurative, not literal. Although the reason for keeping the patient blind as to whether he or she received the drug or a placebo is obvious, the need to keep the tester blind is less obvious.

The reason for keeping the tester blind is to prevent the tester from unintentionally influencing the outcome of the results. The double-blind testing recommendation for lineups does not assume that the tester intends to influence the eyewitness or is even aware of any such influence. This is not an integrity issue. Instead, it is merely an acknowledgment that people in law enforcement, like people in behavioral and medical research, are influenced by their own beliefs and may unknowingly "leak" this information, both verbally and nonverbally, in ways that can influence the person being tested. A vast scientific literature shows that the need for double-blind testing procedures is particularly crucial when there is close face-to-face interaction between the tester and the person being tested (e.g., see Rosenthal & Rubin, 1978).

It should be noted that using a lineup administrator who is blind to the suspect's identity is not the only way to prevent the lineup administrator from influencing the eyewitness. There are other methods, which have been called "blinded" procedures, that prevent the lineup administrator from knowing the position of the suspect in a photo lineup. The U.S. Department of Justice's (1999) guide on eyewitness evidence, for example, describes a folder or envelope "shuffle" method to prevent the officer from knowing which photo the witness is viewing. The shuffle method can be used for both simultaneous and sequential lineups, as it was in the blinded condition of a recent police department field study (Wixted et al., 2016). Alternatively, photo lineups can be administered using laptop computers that shuffle the order of the array, with the screen kept out of view of the lineup administrator.

Collect a confidence statement at the time of the identification

At the time an eyewitness makes an identification, a statement should be obtained from the eyewitness indicating how confident he or she is that the person identified is the offender. Of course, this assumes double-blind testing: The statement should be obtained by a lineup administrator who does not know which lineup member is the suspect. It is this initial confidence statement—and only this confidence statement—that is known to be a reliable indicator of accuracy. As we note in the next section, later statements of confidence by the eyewitness may not be reliable indicators of accuracy because confidence is malleable as a function of later events.

Additional Notes on Concerns About Contamination of Confidence

Before we discuss the issue of measuring the confidence-accuracy relation, we offer a deeper discussion of factors that can contaminate witness confidence and threaten its

relation to accuracy. This discussion can help produce a better understanding of the five recommendations for pristine procedures that were discussed above as they relate to witness confidence.

The confidence that people have in a memory is malleable. Studies show that simply imagining that some childhood event happened (when in fact it did not) can lead people to develop false confidence that they remember the fictitious event actually happening (Garry, Manning, Loftus, & Sherman, 1996). In the case of eyewitness identification, both the anticipation by eyewitnesses that they will later be cross-examined about their identification and the encouragement to prepare themselves for cross-examination have been shown to inflate witnesses' confidence (e.g., Wells, Ferguson, & Lindsay, 1981). Presumably, this confidence inflation occurs because witnesses rehearse the event in preparation for cross-examination, which makes the memory more vivid and fluently retrieved and thereby makes it seem more true, even if it is a false memory. Again, however, our thesis about the diagnosticity of confidence applies only to the initial confidence of the witness at the time of identification, not to later feelings of confidence that might be the product of post-identification contamination.

Perhaps the biggest threat to our ability to rely on confidence in eyewitness identification occurs when witnesses receive post-identification feedback that suggests they made an accurate identification (Wells & Bradfield, 1998). There is now a large body of eyewitness-identification studies showing that a simple comment to an eyewitness who has made a mistaken identification (e.g., "Good, you identified the suspect") can lead to immediate strong inflation of the witness's confidence. The effect of post-identification feedback is large. A recent meta-analysis of post-identification feedback studies showed that the eyewitnesses' confidence in their mistaken identifications was inflated by approximately a full standard deviation following such a comment (Steblay, Wells, & Douglass, 2014). The post-identification feedback effect is more muted for accurate eyewitness identifications, which means that confirmatory post-identification feedback actually harms the relation between accuracy and confidence (Charman & Wells, 2012).

There is a provocative and important twist to the post-identification feedback effect. Specifically, in post-identification feedback experiments, the question asked of witnesses is "How confident were you *at the time of the identification*?" Whereas few might be surprised that witnesses' post-identification confidence is inflated by confirmatory post-identification feedback, these studies measure the witnesses' retrospective confidence (not current confidence) by asking them to report how confident they recall having been at the time of the identification (before they received the feedback). So, post-identification feedback not only affects current confidence but also distorts eyewitnesses' recall for how confident they were at an earlier time. In fact, in a *New York Times* op-ed in 2000, Jennifer Thompson had this to say about her initial mistaken ID of Ronald Cotton: "Several days later, looking at a series of police photos, I identified my attacker. I knew this was the man. I was completely confident. I was sure" (Thompson, 2000). In truth, Jennifer Thompson was not completely confident at the time: Her initial ID was made with low confidence. However, feedback that she received at a later time led her to erroneously recall having been sure from the outset.

Interestingly, when witnesses were asked if post-identification feedback might have influenced how they answered the confidence question, most said "no," yet those who said "no" were no less influenced than were those who said "yes" (Wells & Bradfield, 1998). Moreover, post-identification feedback produces this same type of distortion not just for retrospective confidence but also for other testimony-relevant self-reports of eyewitnesses, such as reports of how much attention they paid at the time of witnessing and how good their view was of the perpetrator (see Steblay et al., 2014, for a meta-analysis of all these measures).

Experimental evidence indicates that lineup administrators' own expectations are likely to influence the confidence of the witness even when the lineup administrators are given an objective script to follow and are instructed to not deviate from that script. Garrioch and Brimacombe (2001) randomly assigned people to the role of witness or lineup administrator and then randomly assigned lineup administrators to a condition in which they were led to believe that the perpetrator was in a particular position of the lineup or a condition in which the lineup administrators were told nothing about the perpetrator position in the lineup. In reality, the perpetrator was never in the lineup. But when witnesses chose the lineup member who the lineup administrator had been led to believe was the perpetrator, the witnesses reported being much more confident than when the lineup administrator had no expectations about which person was the perpetrator. Videotapes of the lineup administrators' behaviors showed different patterns of post-identification nonverbal or paralinguistic behaviors as a function of lineup administrators' expectations about which lineup member was the perpetrator. These influences of the lineup administrators' expectations on the confidence of the witnesses occurred despite the fact that there were no incentives or other motivations on the part of the lineup administrators. Furthermore, 100% of the lineup administrators indicated that they believed they did not provide any post-identification feedback, and 95% of the witnesses believed they did not receive any post-identification feedback.

So, post-identification feedback appears to be a pernicious problem. Fortunately, we have long known the solution for preventing the contamination of post-identification feedback, namely the double-blind lineup procedure that eyewitness researchers have been proposing for over 25 years (Wells & Luus, 1990). In fact, one of the primary reasons for double-blind lineup testing is to prevent the lineup administrator from giving inadvertent feedback that could distort the confidence of the witness. The simple beauty of the double-blind lineup procedure is that the lineup administrator does not know if the witness picked a known-innocent filler or picked the suspect in the case. That same double-blind lineup administrator can then secure a confidence statement from the witness prior to any opportunity for the witness to be given feedback about whether the identified person was the suspect or was a lineup filler (Wells & Bradfield, 1999).

In addition to conducting the lineup using a double-blind procedure, eyewitness-identification researchers have long advocated videotaping the entire eyewitness-identification procedure (e.g., Kassin, 1998). And the idea of videotaping all identification procedures was recently endorsed by a committee of the National Academy of Sciences (National Research Council, 2014). The initial confidence statement is then a matter of record, and it is that initial confidence statement, not later confidence statements, that prosecutors and courts should rely upon. If the case reaches trial, juries should use only this initial confidence statement for assessing the reliability of the identification.

Of course, having a pristine assessment of witness confidence at the time of the identification does not prevent witnesses from undergoing confidence inflation later and perhaps being quite positive at trial. But that is why we emphasize so strongly that the reliability of confidence statements must be based on the eyewitness's initial confidence, not later claims of confidence. And this is where courts have commonly made a serious mistake. Courts routinely permit witnesses to state their confidence at pretrial hearings or at trial, well after they might have undergone serious confidence inflation from repeated identifications, coaching, confirmatory feedback, and so on. The confidence of the witness at the time of a preliminary hearing or at trial is not a pristine assessment of confidence.

Interestingly, the U.S. Supreme Court's guiding ruling on eyewitness identification, which is now nearly 40 years old, urged lower courts to consider the confidence that the eyewitness had *at the time of the identification* in evaluating the reliability of an eyewitness identification (*Manson v. Braithwaite*, 1977). What can be done if the lineup administrator failed to secure a confidence statement from the witness at the time of the identification? Some courts might be tempted to simply ask the witness to cast his or her mind back to the lineup and recall how confident he or she was at the time of the identification. But, as the literature on the post-identification feedback effect shows, witnesses do not accurately recall their initial uncertainty if confidence inflation has occurred as a result of contaminating influences, and instead recall having been confident all along. There is no substitute for taking a confidence statement at the time of the identification.

It is also important to keep in mind that our claims about the reliability of confidence as an indicator of accuracy in eyewitness identification apply only to cases in which the eyewitness-identification test procedures were pristine (Box 3). Unfortunately, at this point, not all jurisdictions in the United States collect a confidence statement at the time of the identification, and when they do, they often do not use a double-blind procedure. Indeed, as recently as 2001, there was no jurisdiction in the United States that used double-blind lineup procedures. Fortunately, efforts by eyewitness-identification researchers, in partnership with the Innocence Project, local and state-level reform commissions, and other policymakers, have managed to facilitate reforms on eyewitness-identification procedures in a growing number of jurisdictions in the United States. As of the time of this writing, for example, state laws have been passed by legislators that require double-blind lineup administration in Connecticut, Colorado, Kansas, Illinois, Maryland, North Carolina, Ohio, and Vermont. Additional states have used other mechanisms to force the use of double-blind lineup administration. New Jersey, for example, requires double-blind lineup administration via a plenary mandate from the attorney general of New Jersey. Oregon's Supreme Court issued a decision (*State v. Lawson*, 2012) that largely makes double-blind lineup procedures necessary in Oregon. In addition, the states of Texas, Rhode Island, Wisconsin, and West Virginia have achieved substantial compliance for using double-blind lineup procedures through a combination of laws and influential task-force recommendations. In addition, individual jurisdictions such as Suffolk County, Massachusetts (Boston and surrounding areas), Santa Clara County, California (including San Jose and Palo Alto), Minneapolis, Minnesota, and many other large and small jurisdictions have made eyewitness-identification reforms that include the requirement of double-blind lineup administration. At the time of this writing, numerous other states are considering requiring double-blind lineup administration.

Box 3. Pristine Lineup Conditions

1. Include only one suspect per lineup
2. The suspect should not stand out in the lineup
3. Caution that the offender might not be in the lineup
4. Use double-blind testing
5. Collect a confidence statement at the time of the identification

Because there remain many jurisdictions that have not yet adopted pristine eyewitness-identification testing procedures, it is important that we emphasize a caveat to our primary thesis. Specifically, our claim regarding the high diagnosticity of eyewitness identifications made with high confidence does not extend without qualification to those jurisdictions that have not yet made reforms to ensure pristine procedures. For example, as we will show later, a high-confidence ID made from an unfair lineup is considerably more error prone than a high-confidence ID made from a pristine lineup. A similar risk of error may occur when eyewitness-identification procedures depart from the other recommended procedures as well, though detailed investigations into their effect on high-confidence accuracy have not been performed. Nevertheless, it seems safe to say that prosecutors and defense attorneys are likely to debate the reliability of a suspect ID whenever the procedures summarized in Box 3 have not been followed, and for good reason. For example, if a lineup was administered in a non-blind fashion, the question will inevitably arise as to whether the lineup administrator unintentionally influenced the identification made by the witness and the confidence of the witness, which research shows is a real possibility (e.g., Garrioch & Brimacombe, 2001). As noted in the National Research Council (2014) report, "The use of double-blind procedures will eliminate a line of cross-examination of officers in court" (p. 107). The same argument can be made for each of the practices listed in Box 3.

Whereas the information value of a high-confidence ID may be called into question whenever non-pristine testing conditions are used, the information value of a low-confidence ID is never open to question. No matter how good or how bad the eyewitness-identification procedure is, a low-confidence ID implies that the ID is error prone. As noted above, if an identification was made in a jurisdiction that has not adopted pristine testing conditions, the defense and the prosecution may end up debating in court about whether or not the testing procedure was good enough. However, that debate is rendered moot if it is known that the eyewitness made an initial good-faith ID with low confidence. Such an ID is error prone, even under pristine testing conditions.

Returning to the main point, if the pristine conditions listed here (summarized in Box 3) are followed, then a low-confidence ID implies low accuracy, and a high-confidence ID implies high accuracy. Although eyewitness-identification research conducted over the last 20 years has shown this to be true, our understanding of this issue emerged rather gradually, which may help to explain why it is not more widely understood within the legal system. We turn now to a consideration of the eyewitness confidence-accuracy literature, beginning with a review of the methods used to measure the confidence-accuracy relationship (a key part of the story). We emphasize that except where noted, the studies we consider were carried out using the pristine testing conditions summarized above. How reliable is an ID made under those conditions, according to what we have learned over the last 20 years? To answer that question, we first have to consider which approach to measuring the confidence-accuracy relation most accurately conveys the information sought by judges and juries.

Measuring the Eyewitness Confidence-Accuracy Relationship

The data used to investigate the confidence-accuracy relationship for eyewitness identification come mostly from forensically relevant lab studies in which participants become witnesses to a mock crime (e.g., by watching a live enactment or a video of someone committing a crime, such as snatching a purse, planting a bomb, or robbing someone at an ATM) and are later shown a lineup in which the perpetrator (the target) is either present or absent. A target-present lineup includes the perpetrator along with (usually five or seven) similar fillers; a target-absent lineup is the same except that the perpetrator is replaced by another similar filler, as illustrated in Figure 1. In some studies, the individual depicted in the replacement photo serves the role of the designated "innocent suspect." In other studies, no one in the target-absent lineup is designated to serve the role of an innocent suspect, so the risk to an innocent suspect is calculated by dividing the number of identifications in the target-absent lineup by the number of fillers (thereby assuming a perfectly fair lineup). When presented with a target-present or target-absent lineup, a witness in a mock-crime study first makes a decision—which consists of identifying the suspect, identifying a filler, or rejecting the lineup (i.e., saying that the perpetrator is not there)—and then supplies a confidence rating associated with that decision. A correct response consists of (a) a suspect

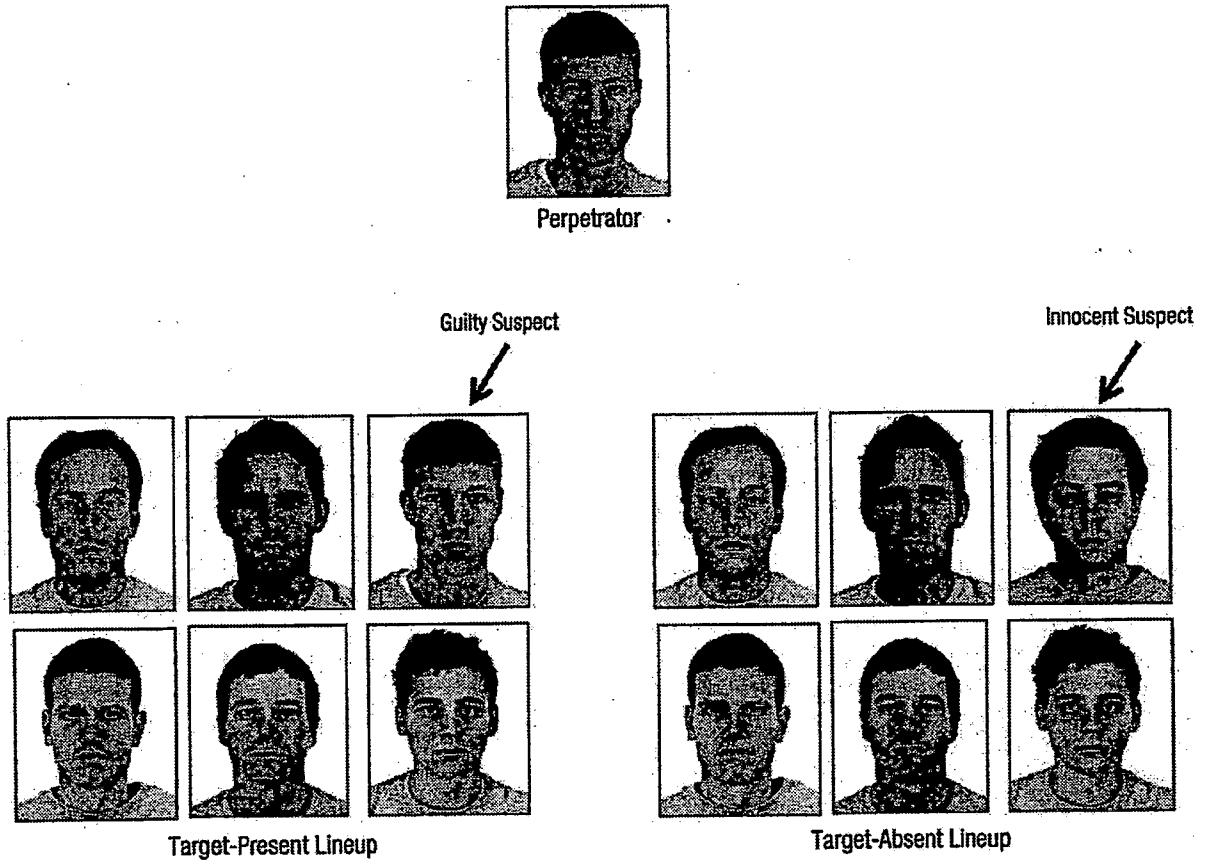


Fig. 1. Example lineups used in mock-crime studies. (Images drawn from the Chicago Face Database; Ma, Correll, & Wittenbrink, 2015.)

ID from a target-present lineup or (b) the rejection of a target-absent lineup, whereas an incorrect response consists of (a) a suspect ID from a target-absent lineup (if there is a designated innocent suspect), (b) a filler ID from either type of lineup, or (c) the rejection of a target-present lineup.

Our appreciation of the information value of confidence has grown considerably in recent years, partly as a result of methodological changes in the way that researchers measure the confidence-accuracy relationship. Prior research on the issue can be divided into three phases according to the measure that was used. In Phase 1, the point-biserial correlation coefficient was the preferred measure. In Phase 2, calibration curves were more commonly used. In Phase 3, confidence-accuracy characteristic (CAC) analysis (Mickes, 2015) and closely related but more complete Bayesian analyses (Wells, Yang, & Smalarz, 2015) have been used. An argument we will advance is that only the measures used in Phase 3 directly address questions of interest to the legal system.

The point-biserial correlation coefficient

In Phase 1, the relationship between confidence and accuracy was measured by computing the standard Pearson r correlation coefficient between the accuracy of a response (e.g., coded as 0 or 1) and the corresponding confidence rating (e.g., measured using a 5-point scale from *just guessing* to *very sure that is the person*). Because accuracy is coded as a dichotomous variable, the Pearson r in this case is known as a point-biserial correlation coefficient. Using this measure, much of the initial research examining eyewitness certainty suggested that certainty was largely unrelated to identification accuracy (e.g., Clifford & Scott, 1978; Deffenbacher, Brown, & Sturgill, 1978; Leippe, Wells, & Ostrom, 1978), with correlation coefficients generally falling into the .00 to .20 range.

In these studies, all of the data were bundled together for the analysis, whether the eyewitness made a suspect ID, a filler ID, or a non-ID. In a later meta-analysis,

Sporer, Penrod, Read, and Cutler (1995) found that the relationship was noticeably stronger—about .41—when the analysis was limited to only those who made an ID from a lineup (i.e., when the analysis was limited to "choosers" who identified a suspect or a filler). Limiting the analysis to choosers is reasonable because only witnesses who choose someone end up testifying in court against the person they identified. This move—separating choosers (those who make suspect IDs and filler IDs) from non-choosers (those who make a non-ID)—foreshadowed a later move that we will argue is critical, namely separating choosers who make suspect IDs from choosers who make filler IDs. All three decision outcomes (suspect IDs, filler IDs, and non-IDs) need to be assessed for the independent information they provide about whether or not the lineup contains a guilty suspect. Nevertheless, Sporer et al.'s separation of choosers from non-choosers led to an important advance in our understanding of the confidence-accuracy relationship.

The novel message from Sporer et al. (1995) was that confidence is a more reliable indicator of accuracy for choosers than had been previously assumed. At .41, the correlation for choosers was clearly too large to argue that eyewitness confidence should be disregarded. Nevertheless, over the years, the interpretation of the Sporer et al. (1995) meta-analysis has generally drifted in the negative direction, as if the message were actually the opposite. For example, Reinitz, Seguin, Peria, and Loftus (2012) said, "It is well known that confidence is often a relatively poor predictor of accuracy (e.g., Bothwell, Deffenbacher, & Brigham, 1987; Sporer et al., 1995)" (p. 1089). Buratti and Allwood (2012) noted that "although many witnesses may feel confident about their identification, the relation between identification confidence and the correctness of the identification is weak (Brewer & Wells, 2011; Sporer et al., 1995)" (p. 590). Neal, Christiansen, Bornstein, and Robicheaux (2012) pointed out that "contrary to jurors' beliefs, eyewitness confidence is not a strong indicator of accuracy (Penrod & Cutler, 1995; Sporer et al., 1995)" (p. 50). And Wilson, Hugenberg, and Bernstein (2013) recently maintained that "one surprising lesson that psychologists have learned about memory is that the confidence of an eyewitness is only weakly related to their recognition accuracy (p. 98; see Sporer et al., 1995, for a review)."

It seems fair to say that these characterizations do not accurately convey what the Sporer et al. (1995) meta-analysis actually found. What Sporer et al. actually found was that, for choosers, the confidence-accuracy relationship is surprisingly strong. They also emphasized the fact that later events can inflate an eyewitness's confidence, obviously without increasing the accuracy of the initial ID. Some of the post-ID factors that can inflate confidence include hearing that other witnesses have identified the same suspect (Luus & Wells, 1994), being exposed to the identified suspect again (Brown, Deffenbacher, & Sturgill, 1977), and receiving encouraging feedback from police about the accuracy of the ID (Wells & Bradfield, 1998). However, for an *initial* ID made from a pristine lineup, the Sporer et al. (1995) meta-analysis showed that initial confidence is a reasonably good indicator of accuracy. In fact, the point-biserial correlation coefficient is a standard effect-size statistic (e.g., Rosnow, Rosenthal, & Rubin, 2000), and a value of .41 falls between the conventional definitions for medium (.30) and large (.50) effects (Cohen, 1988).

Shortly after Sporer et al.'s (1995) meta-analysis was published, the argument was made that even their upgraded assessment of the confidence-accuracy relationship was, if anything, an understatement. Juslin et al. (1996) showed that the magnitude of the point-biserial correlation can be low even when the relationship between confidence and accuracy exhibits perfect calibration. Perfect calibration exists when the level of confidence expressed by an eyewitness corresponds exactly to the percentage of eyewitnesses who are correct when they express that level of confidence. For example, under perfect calibration, witnesses who express 60% confidence in an ID are correct 60% of the time, and witnesses who express 80% confidence in an ID are correct 80% of the time. Even though the relationship between confidence and accuracy could not possibly be stronger than that, Juslin et al. showed that the point-biserial correlation could be low or high, depending on how responses are distributed across the confidence categories. In Appendix A, we provide a concrete example illustrating how this could be. The key point is that the .41 correlation coefficient for choosers is potentially compatible with a *very* strong confidence-accuracy relationship.

These considerations suggest that the point-biserial correlation coefficient is not the best statistic to use when trying to inform the legal system about the utility of eyewitness confidence. Note that this is not a criticism of the statistic itself. The point-biserial correlation coefficient is a perfectly valid effect-size statistic when used in conjunction with certain statistical tests, such as a *t* test (Rosnow et al., 2000). For example, in eyewitness-identification studies, one might ask whether the average level of confidence is higher for correct IDs than for incorrect IDs. This would be the appropriate way to analyze the data if you knew, for each eyewitness, whether his or her ID was correct or incorrect and you wanted to estimate his or her likely level of confidence. In fact, this is how the data were plotted in Figure 1 of Sporer et al.'s (1995) seminal article, and the corresponding point-biserial correlation coefficient of .41 indicates a moderate-to-large

average effect size. Yet this is not the question of interest to the legal system, because in actual practice, the situation is reversed: An eyewitness provides a confidence rating associated with an ID (this is the predictor variable, which is not averaged), and the legal system wants to make the best estimate as to the likely accuracy of that ID (this is the dependent variable, and it equals the average level of accuracy associated with each level of confidence that an eyewitness might express).

This logic suggests, as Juslin et al. (1996) pointed out, that plotting average accuracy (on the *y*-axis, as the dependent measure) versus different levels of confidence (on the *x*-axis, as the independent measure) is a more informative way to analyze the data. When plotted this way, the data come closer to providing an answer to the question asked by judges and juries trying to evaluate the reliability of an eyewitness. Their question is: Given that an eyewitness has a particular level of confidence in his or her ID of a suspect, how accurate is that ID likely to be? With regard to that question, a calibration curve provides much more relevant information than a correlation coefficient. Once this fact was understood, Phase 2 was ushered in as eyewitness-identification researchers began to measure the confidence-accuracy relationship by plotting calibration curves.

Calibration analysis

Following Sporer et al. (1995), calibration analyses are also typically performed separately on choosers (those who make a suspect ID or a filler ID) and non-choosers (those who make a non-ID decision). A calibration analysis can be performed whenever a confidence rating scale ranging from 0 to 100 is used. It is important to be clear about the exact computational formula used to compute calibration, so we consider the formula below. In the notation we use here, *nFID* stands for "number of filler IDs" and *nSID* stands for "number of suspect IDs." We also attach subscripts to these symbols, such as *TP*, which denotes target-present lineups, and *TA*, which denotes target-absent lineups. Thus, $nSID_{TP}$ means "number of suspect IDs from target-present lineups." Finally, we add the subscript *c*, which represents the confidence expressed by the witness. Thus, $nSID_{TP\text{-}c}$ means "number of suspect IDs from target-present lineups with confidence *c*," where *c* might be 90% to 100% confident.

Basically, in a calibration analysis of choosers, the percentage-correct accuracy score for a given level of confidence, *c*, is equal to 100 multiplied by the number of (correct) suspect IDs from target-present lineups made with confidence level *c* ($nSID_{TP\text{-}c}$) and divided by the total number of IDs (to suspects and fillers alike) made with confidence level *c*. Many calibration studies have used a target-absent lineup that does not have a designated innocent suspect, so the number of incorrect IDs consists of the number of filler IDs made from target-present lineups with confidence level *c* ($nFID_{TP\text{-}c}$) plus the number of filler IDs made from target-absent lineups with confidence level *c* ($nFID_{TA\text{-}c}$). Thus, for confidence level *c*, calibration equals $100 \times (nSID_{TP\text{-}c}) / (nSID_{TP\text{-}c} + nFID_{TP\text{-}c} + nFID_{TA\text{-}c})$. In practice, $nFID_{TP\text{-}c}$ is often excluded from the denominator, but the results tend to be similar either way.

Calibration studies typically find a strong relationship between confidence and accuracy when (a) the analysis is limited to choosers, (b) the witnesses are adults, (c) the lineups are fair, and (d) the confidence ratings are taken immediately after the ID is made (e.g., Brewer & Palmer, 2010). That is, they find a strong relationship between confidence and accuracy using pristine eyewitness-identification procedures that were also used in previous studies measuring the relationship using the point-biserial correlation coefficient. As an example, Figure 2a presents a calibration curve taken from Brewer and Wells (2006). As we will see, the results shown in Figure 2a are fairly typical of calibration studies, and they show that low-confidence IDs (*c* = 0%–20%) are associated with low accuracy (26.6% correct), whereas high-confidence IDs (*c* = 90%–100%) are associated with much higher accuracy (84.9% correct). It seems difficult to characterize the results shown in Figure 2a as indicating anything other than a very strong confidence-accuracy relationship for choosers. This is true even though the overall point-biserial correlation coefficient in this study was low (.32 for identifications of the thief in the video and .36 for identifications of the waiter in the video). These findings underscore the fact that the confidence-accuracy correlation can be low even when the confidence-accuracy relationship is strong. Note that the story for non-choosers is different. For them, the confidence-accuracy relationship is noticeably weaker (Fig. 2b), which is a conclusion that also corresponds to work using the point-biserial correlation coefficient (Sporer et al., 1995).

These results, like the point-biserial results discussed above, correspond to the 50% base rate of target-present lineups used in that study. As we discuss in more detail later, real police lineups may contain a guilty suspect less than 50% of the time. In such cases, the accuracy rates for choosers would be correspondingly lower than the values shown in Figure 2a, and the accuracy rates for non-choosers would be correspondingly higher than the values shown in Figure 2b. Nevertheless, the basic story would not change: For choosers, the confidence-accuracy relationship is strong, and for non-choosers it is considerably weaker.

Although the results in Figure 2a reflect a strong confidence-accuracy relationship, it also seems fair to say—and it often is said—that witnesses who express high

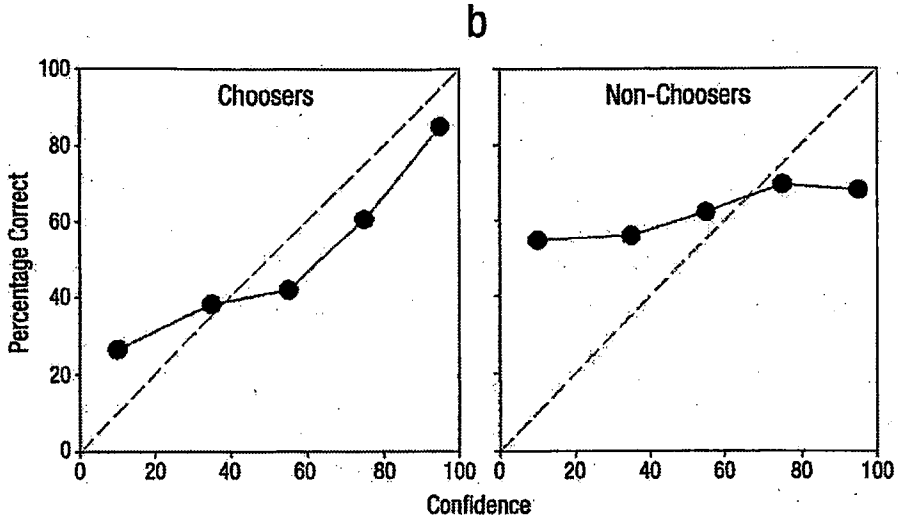


Fig. 2. Calibration data from Brewer and Wells (2006) for choosers (a) and non-choosers (b). The data were pooled across witnesses' identifications of either of the two targets who appeared in a mock-crime video (a thief and a waiter). The dashed line represents perfect calibration.

confidence, such as 90% to 100% confidence, are overconfident because their corresponding accuracy is typically lower than 90% (e.g., Lampinen, Neuschatz, & Cling, 2012; Leach, Cutler, & Van Wallendael, 2009; Valentine & Davis, 2015). Leach et al. (2009) put it this way:

> Given the modest correlation between confidence and identification accuracy, the tendency for witnesses to be overconfident in their decisions (Brewer & Wells, 2006), and the factors that further suppress the confidence-accuracy relation, confidence is of questionable utility in the assessment of eyewitness identification accuracy. (p. 161)

However, this pessimistic assessment seems premature, because the data have still not yet been analyzed in a way that most directly addresses the question of interest to judges and juries tasked with assessing the reliability of an initial eyewitness ID made with a particular level of confidence. In the courtroom, the question of interest is as follows: What does confidence tell us about the reliability of an eyewitness who has identified a *suspect*? The answer to this question is provided by limiting the analysis not just to choosers but to choosers who identify a suspect—just as the legal system limits its consideration to choosers who identify a suspect by referring identified suspects (but not identified fillers) for prosecution.

We refer to the dependent variable in an analysis that excludes filler IDs as *suspect-ID accuracy*, and we refer to a plot of suspect-ID accuracy versus confidence as a CAC analysis to distinguish it from the closely related calibration plot (Mickes, 2015). Unlike a calibration curve, a CAC plot provides the information that judges and juries want to know when they are trying to assess the reliability of an eyewitness who identified a suspect from a lineup.

Once again, our argument should not be construed as a criticism of the calibration statistic. A calibration curve is a perfectly appropriate way to represent the relevant data when the question concerns the confidence-accuracy relationship from the witness's perspective. In a calibration study, witnesses are instructed to choose a confidence rating of 80% (for example) when they believe they would be correct 80% of the time. From the witness's perspective, a correct ID consists of choosing a suspect from a target-present lineup, whereas an error consists of choosing a suspect from a target-absent lineup or choosing a filler from either type of lineup. Thus, a witness presumably interprets the instruction to mean that a confidence rating of 80% should consist of correct responses (suspect IDs from target-present lineups) 80% of the time and errors (suspect IDs from target-absent lineups and filler IDs) 20% of the time. A calibration curve appropriately shows the relationship between what a witness believes about his or her performance and what that performance is actually like.

However, the legal system is concerned with a different issue, because if the eyewitness picked a filler, we already know that the witness did not pick the perpetrator. So, the forensically relevant question is this: Given that the eyewitness picked the suspect with a particular level of confidence, how likely is it that the suspect is guilty? The answer to that question is provided by a CAC plot in

which the dependent measure is suspect-ID accuracy. We next describe how to compute suspect-ID accuracy, and then we reanalyze and plot the published data in terms of CAC analysis. We then use representative calibration data and reanalyze those results using the more detailed Bayesian analysis described by Wells et al. (2015). This analysis shows suspect-ID accuracy across the full range of base rates of target-present lineups (instead of limiting the analysis to the 50% base rate typically used in studies, as CAC analysis does). Using the same basic approach, we also consider a topic that is only rarely considered: What is the information value of a filler ID or a non-ID? These decision outcomes also bear on the likelihood that the suspect in the lineup is guilty, but the information they provide points in the opposite direction than that provided by a suspect ID, in that they are both probative of innocence (Wells et al., 2015). That fact is another reason suspect IDs and filler IDs should not be bundled together when the goal is to inform the legal system. They should not be bundled together because they provide independent (and opposing) information about the likelihood that the suspect in the lineup is guilty.

Confidence-accuracy characteristic analysis

Suspect-ID accuracy is based on the number of suspect IDs from target-present lineups (guilty-suspect IDs) made with confidence level c, $nSID_{TP\text{-}c}$, and the number of suspect IDs from target-absent lineups (innocent-suspect IDs) made with the same confidence level, $nSID_{TA\text{-}c}$. More specifically, suspect-ID accuracy is equal to 100% × $nSID_{TP\text{-}c}$ / ($nSID_{TP\text{-}c}$ + $nSID_{TA\text{-}c}$). Unlike in a real police lineup involving an innocent suspect, in a lab study there is no obvious person to use as the innocent suspect. In other words, there is obviously no one in the target-absent lineup who is suspected of having committed the crime depicted in the mock-crime video (because the experimenter selected the perpetrator in the video and so already knows who he is). How, then, does one compute the number of innocent-suspect IDs? Using one reasonable approach, the innocent suspect in a target-absent lineup is simply a designated filler, usually the filler that was used to replace the perpetrator's photo (as in Fig. 1). This approach is arguably the most logical approach because only the suspect differs across target-present and target-absent lineups (the other fillers are held constant). It also has the advantage of making it easy to count not only the number of guilty-suspect IDs that are made from target-present lineups but also the number of innocent-suspect IDs that are made from target-absent lineups. In that case, computing suspect-ID accuracy for each level of confidence is entirely straightforward.

If the replacement photo is not designated as the innocent suspect in target-absent lineups, then $nSID_{TA}$ can instead be estimated from the number of filler IDs from target-absent lineups divided by lineup size (n). In that case, suspect-ID accuracy would be given by 100% × $nSID_{TP\text{-}c}$ / ($nSID_{TP\text{-}c}$ + $\sim nSID_{TA\text{-}c}$), where $\sim nSID_{TA\text{-}c}$ = ($nFID_{TA\text{-}c}$ / n). For most of the studies we will review, the number of IDs of the replacement photo was not reported, so this approach to estimating the false-ID rate was the only option available. In the long run, these two approaches to computing the false-ID rate (namely, designating an innocent suspect vs. counting all target-absent filler IDs and dividing by lineup size) will yield the same average results so long as all of the fillers—including the one that replaces the perpetrator—are selected using the same decision rule, such as the rule that fillers must match the description of the perpetrator. For any particular study, however, the two approaches can yield different results. For example, by chance, half the time, the replacement photo (i.e., the natural choice to serve as the innocent suspect) will be a more attractive option than the average filler in the lineup, and $1/n$ of the time it will, by chance, be the most attractive option. In these studies, dividing the target-absent filler-ID rate by n will underestimate the false-ID rate, making suspect-ID accuracy at each level of confidence look better than it would look if the replacement photo had been designated as the innocent suspect. On the other hand, the other half of the time, the replacement photo will be a less attractive option than the average filler in the lineup, and $1/n$ of the time it will be the least attractive option. In these studies, dividing the target-absent filler-ID rate by n will overestimate the false-ID rate, making accuracy at each level of confidence look worse than it would if the replacement photo had been designated as the innocent suspect. Thus, our conclusions about the confidence-accuracy relationship will be based on what studies suggest in the aggregate, not on what any particular study suggests. Nevertheless, in light of these considerations, we believe that researchers should report the frequency with which each target-absent lineup member was identified. In any given study, it might be the case that, by chance, the replacement filler was chosen more often than the other fillers. If so, a conclusion derived from that study alone would apply more to unfair lineups than to fair lineups. When target-absent filler-ID rates for each lineup member are not reported, there is no way to tell if this is a problem or not.

A third approach to designating an innocent suspect in a target-absent lineup is problematic if the goal is to measure the confidence-accuracy relationship under pristine testing conditions. Using this third approach, the innocent suspect is defined to be the filler in the

target-absent lineup who most resembles the perpetrator. The innocent suspect stands out in that sense and will therefore be chosen more often than the other fillers. For example, in a recent study, Sučić, Tokić, and Ivešić (2015) first selected a set of six fillers who matched the description of the target in the target-present lineup and then selected the one who would serve as the designated innocent suspect in the following way: "The six photographs that were selected were top ranked for photograph similarity and the match to modal description, and the highest ranked photograph was used as the designated innocent suspect (suspect replacement) in a [target-absent] lineup" (p. 802). In other words, the designated innocent suspect in this study was chosen in such a way as to ensure that it would stand out in the target-absent lineup (i.e., by design, this was an unfair lineup). As noted earlier, in an ideal lineup, the suspect does *not* stand out, and if the police made lineups following this approach, those lineups would be unfair. We will separately review studies that used this approach, and we will see that it has a profoundly negative effect on the confidence-accuracy relationship even for an otherwise pristine identification procedure. However, the bulk of our review will consist of a reanalysis of studies that used lineups in which the replacement photo in the target-absent lineup was not selected using a different decision rule than the other fillers. For these studies, the number of innocent-suspect IDs was estimated by counting all filler IDs from target-absent lineups and dividing by lineup size. Again, for any single study, this approach to estimating the false-suspect-ID rate could mask the fact that the target-absent lineup was, by chance, biased toward or away from the replacement photo (i.e., toward or away from the photo that would most logically serve as the innocent suspect). Our conclusions about the relationship between confidence and accuracy are not based on any single study but are instead based on the aggregate results from many studies.

It is important to emphasize that the suspect-ID accuracy measure in CAC analysis is not another measure of calibration. As described in more detail below, random chance accuracy for suspect IDs is typically 50% correct, not 0% correct. Thus, if a 0-to-100 confidence scale is used, one would not expect to see suspect-ID accuracy match the level of confidence at the low end of the scale. In a CAC analysis, the question is not how well confidence and accuracy match; instead, the question is simply this: How does suspect-ID accuracy vary as confidence ranges from low to high? Because that is the question, CAC analysis can be carried out using any monotonic confidence rating scale (unlike a calibration analysis, which requires a 0-to-100 scale). In point of fact, very few police departments use 0-to-100 scales to assess initial confidence, so calibration is not often at issue in the legal system (although it is of interest in laboratory studies).

Suspect-ID accuracy is what judges and juries want to know when trying to evaluate the reliability of an eyewitness identification: Given that the suspect in this trial has been identified by an eyewitness with a particular level of confidence, what is the probability that the ID is correct? This is a question about the subset of eyewitnesses who identify a suspect. No other way of plotting the data (and no numerical summary of the data—not the point-biserial correlation coefficient nor any other statistic) provides the answer to that question more directly and more understandably than a visual plot relating suspect-ID accuracy to confidence. At a glance, it not only reveals how much suspect-ID accuracy changes as a function of confidence, it also shows how reliable eyewitness IDs are for each level of confidence. Therefore, we use this approach in our review of actual experiments, to which we now turn.

A Review and Reanalysis of Eyewitness Confidence and Accuracy Data

We begin with a reanalysis of some of the studies that were included in the Sporer et al. (1995) review, which used the correlation coefficient to quantify the confidence-accuracy relationship, and then we reanalyze subsequent data that were originally published as calibration curves or as receiver operating characteristic (ROC) curves.

A reanalysis of three of the original Sporer et al. (1995) meta-analysis experiments

What would the data that were reviewed by Sporer et al. (1995) suggest about the confidence-accuracy relationship if, instead of computing the point-biserial correlation for choosers, one simply plotted the data as a CAC plot? To find out, we contacted each of the authors of that article and requested the original data from the 30 experiments analyzed in their Table 1 so that the data could be replotted as CAC curves. Quite understandably, most of the data are no longer available. However, data from three of those 30 experiments, which are representative of the larger data set in terms of the point-biserial correlation, are still available and were kindly provided to us by J. Don Read. The three experiments are Experiments 1 and 2 from Read, Yuille, and Tollestrup (1992) and Experiment 3 from Read, Tollestrup, Hammersley, McFadzen, and Christensen (1990). The data from Experiment 2 of Read et al. (1992) were originally analyzed separately for two targets (a central suspect and a peripheral suspect)

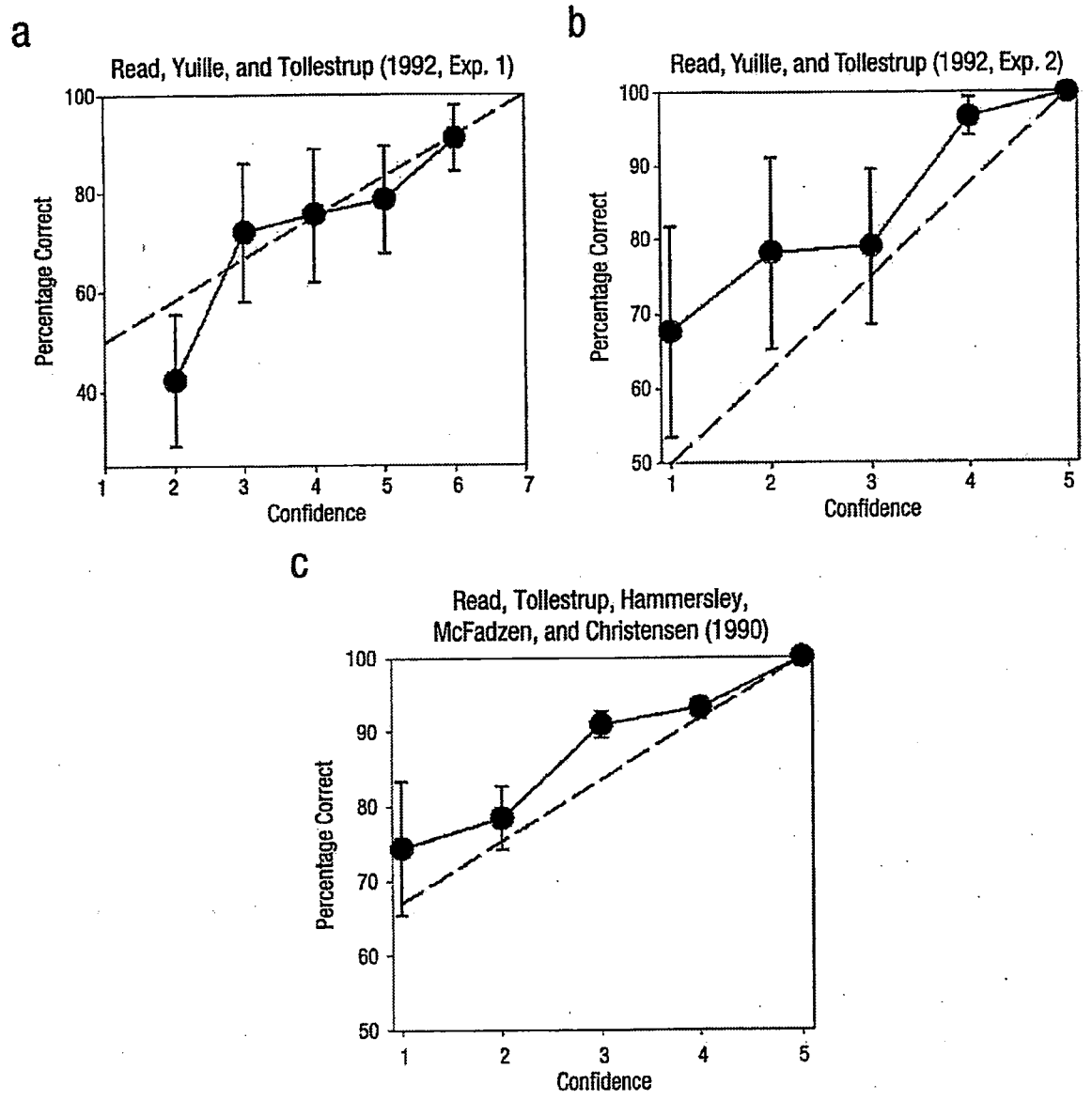


Fig. 3. Confidence-accuracy characteristic curves for three studies from the original Sporer et al. (1995) meta-analysis. The dashed lines indicate chance accuracy.

who were tested using different lineups, but we combined these data in our analysis because the results were quite variable when plotted separately because of the relatively small number of participants tested.

The point-biserial correlation coefficients for choosers in these three experiments were, respectively, .246, .511, and .359. The mean and standard deviation of these three values (M = .37, SD = .13) are similar to the corresponding values in the full data set (M = .41, SD = .16). In other words, these data appear to be reasonably representative of the larger set of studies analyzed by Sporer et al. (1995). What do these same data look like when plotted as a CAC curve? Figure 3 shows the CAC curves for the three obtainable data sets from the experiments analyzed in the original Sporer et al. (1995) meta-analysis. In each figure, a dashed diagonal line has been drawn for reference purposes. The line is drawn in such a way that the lowest confidence rating corresponds to chance suspect-ID accuracy and the highest confidence rating corresponds to 100% correct (perfect accuracy).

Note that chance accuracy corresponds to the level of performance that would be obtained if choosers randomly identified individuals from lineups. If an equal number of target-present and target-absent lineups were used, then chance accuracy for suspect IDs would be 50%. For example, if 1,000 "choosers" randomly sampled

from six-person target-present lineups, about 1/6 of them would land on the guilty suspect. Thus, this group would, on average, identify (1 / 6) × 1,000 = 167 guilty suspects. Similarly, if another 1,000 choosers randomly sampled from six-person target-absent lineups, about 1/6 of them would land on the innocent suspect. Thus, this group would identify 1,000 fillers and an estimated (1 / 6) × 1,000 = 167 innocent suspects. In other words, each group would identify the same number of suspects. Half of the suspect IDs would be randomly made to guilty suspects and half would be randomly made to innocent suspects. Thus, suspect-ID accuracy would be 167 / (167 + 167) = .50. Generally speaking, when using CAC analysis, random chance accuracy is equal to the base rate of target-present lineups used in a study.

For the two experiments from Read et al. (1992) shown in Figure 3a and 3b, the base rate of target-present lineups was approximately 50%. Thus, random chance suspect-ID accuracy in these two studies was 50% correct (and, of course, perfect accuracy is 100% correct). For the experiment from Read et al. (1990) shown in Figure 3c, the base rate of target-present lineups (and, therefore, chance accuracy) was approximately 67%. In every plot we show (both here and for all subsequent calibration and ROC experiments we consider), the diagonal line represents the full range of performance from chance accuracy (usually 50%) to perfect accuracy (100%).

By any reckoning, the data shown in Figure 3 exhibit a strong relationship between confidence and accuracy.[1] This is true despite the fact that the very same data are associated with a mean point-biserial correlation between confidence and accuracy of .37, meaning that only 14% of the variance was accounted for (i.e., $.37^2 = .14$). The data in Figure 3a range from 42% correct for the lowest level of confidence (a rating of 2 on the 7-point scale) to 91% correct for the highest level of confidence (a rating of 6 on the 7-point scale). Participants in that particular study used confidence ratings of 1 and 7 too rarely to estimate performance associated with the lowest and highest possible confidence levels. A similar range of performance is evident for the data shown in Figure 3b (low-confidence accuracy = 62% correct; high-confidence accuracy = 100% correct). In Figure 3c, a smaller range is evident but only because low-confidence accuracy was fairly high because of the high target-present base rate in that study.

Note that the highest levels of confidence in Figure 3b and 3c are both associated with 100% accuracy. Averaged across the three experiments, accuracy associated with the lowest level of confidence was 61.4% correct (this score would be slightly lower had all three studies involved a 50% target-present base rate), whereas accuracy associated with the highest level of confidence was 97.0% correct. That is, according to these studies, which are associated with an average point-biserial correlation of only .37, low confidence implies low accuracy, whereas high confidence implies very high accuracy. These are some of the same studies that have helped to convince the legal system to disregard eyewitness confidence because the correlation between confidence and accuracy is low.

A reanalysis of later research using the calibration approach

Next, we review studies that reported calibration curves for choosers and were designed to create pristine testing conditions. Most of these studies did not report choosing rates for each filler ID in target-absent lineups, so we cannot be sure that a fair lineup was used in every case. Nevertheless, in these studies, the same decision rule was used to select the fillers and the replacement photo, so the results, considered in the aggregate, represent what would likely be observed when pristine testing conditions are used. Every one of these studies, many of which come from the Neil Brewer lab, has shown a strong relationship between confidence and accuracy, as the authors of these studies have repeatedly emphasized. The calibration plots in the published literature have generally counted only suspect IDs from target-present lineups while counting all filler IDs (not just estimated suspect IDs) from target-absent lineups. Here, we replot those same data in the form of CAC plots, which means we focused on correct suspect IDs from target-present lineups and (usually estimated) incorrect suspect IDs from target-absent lineups.

Recently, a number of studies using ROC analysis in the context of eyewitness identification have been published. These studies have used confidence ratings to construct the ROC, but most were not specifically concerned with the confidence-accuracy relationship. Still, these studies also provide the data needed to construct a CAC plot, so we included ROC studies as well. More specifically, we included in our analysis the calibration and ROC studies that met the following criteria:

1. The studies investigated recognition memory for faces (not recall of details).
2. The participants were adults.
3. The lineups were designed to be fair in that the replacement photo for target-absent lineups was chosen using the same decision rule that was used to choose the other fillers (we consider unfair lineups in a later section).
4. Confidence ratings were taken soon after the ID (5 minutes or less post-ID).
5. Memory was tested using a lineup.

Table 1. Confidence-Accuracy and ROC Studies Included in Our Review

Study	Experiment	Original figure or table	Notes
1*	Brewer, Keast, and Rishworth (2002)	Figure 1	
2*	Brewer and Wells (2006)	Figure 1	
3	Carlson and Carlson (2014)	Figure 1	Reanalysis of raw data that were supplied by first author; the 7-point confidence scale was reduced to a 3-point scale to reduce error variance; and we excluded a condition involving photos with an artificial feature (all faces in the lineup had a large black letter *N* sticker on one cheek) because it seemed far removed from the forensic situation.
4*	Carlson, Dias, Weatherford, and Carlson (2016)	Figure 2	
5*	Dobolyi and Dodson (2013)	Figure 2	
6*	Dodson and Dobolyi (2016)	Figure 1	Multiple numerical confidence scales were used; all were converted to 0%-to-100% scales.
7*	Horry, Palmer, and Brewer (2012)	Figure 3	
8	Juslin, Olsson, and Winman (1996)	Figure 4	This study used a 75% target-present base rate; accuracy scores were estimated as described in the appendix of Wixted, Read, and Lindsay (2016).
9*	Keast, Brewer, and Wells (2007)	Figure 1	This study reported data for adults only, which were a subset of the data in Brewer and Wells (2006).
10	Lindsay, Nilsen, and Read (2000)	Table 3	The 11-point confidence scale was reduced to a 3-point scale (*low*, *medium*, and *high*) to reduce error variance.
11*	Mickes (2015)	Figure 2; Figure 4	Data were collapsed across the recollection and no-recollection conditions of Experiment 1 because too few low-confidence IDs were obtained to yield stable accuracy estimates; simultaneous lineup data shown in Figure 4 (Experiment 2) are also included in our plot.
12*	Mickes, Flowe, and Wixted (2012), Experiment 1a and 1b combined	Figure 6a	We reanalyzed the raw data (ROC data were reported in the original article).
13*	Palmer, Brewer, Weber, and Nagesh (2013), Experiment 1	Figure 1	
14*	Palmer, Brewer, Weber, and Nagesh (2013), Experiment 2	Figure 3	
15	Read, Lindsay, and Nichols (1998), Experiment 3	Figure 6.4	Data were collapsed across the prewarned and nonwarned conditions to reduce random error; raw data provided by the first author were reanalyzed.
16*	Sauer, Brewer, and Wells (2008)	Table 3	
17*	Sauer, Brewer, Zweck, and Weber (2010)	Figure 1	
18*	Sauerland and Sporer (2009)	Figure 3	
19	Smith and Flowe (2014)	Figure 2	We reanalyzed the ROC data reported in the original article.
20*	Weber and Brewer (2004)	Figure 5	Mini-lineups (four members) were used in this experiment.

Note: The 15 studies marked with an asterisk all used a 100-point confidence scale.

Relevant studies were identified by searching the Web of Science database using the keywords "calibration," "confidence," and "eyewitness identification." In addition, we searched references cited by the identified studies, and we examined all studies that later cited the articles included in our review. We do not claim this to be an exhaustive review, but it is undoubtedly a large and representative sample of calibration studies. The studies that satisfied these criteria and that were included in our review are listed in Table 1. We also included Read, Lindsay, and Nichols (1998) and D. S. Lindsay, Nilsen, and Read (2000) even though those authors did not specifically present their data as a calibration curve or as an ROC curve. However, J. Don Read provided us with the raw data from Read et al. (1998), and D. S. Lindsay et al. (2000) presented their data in enough detail that a CAC plot could be constructed. We further included the adult sample from Keast, Brewer, and Wells (2007) even though

their study used a subsample of adult participants who were tested by Brewer and Wells (2006), which is also included in our review.

Panels (a) through (s) of Figure 4 present the CAC plots from the calibration studies and ROC studies that we identified. Some of the studies included their raw data, making it possible to directly compute suspect-ID accuracy. For studies that did not, we precisely estimated accuracy scores from their calibration plots using WebPlotDigitizer (http://arohatgi.info/WebPlotDigitizer/) and converted the reported accuracy score that included filler IDs to one that included only suspect IDs. This was accomplished by taking the reported accuracy score for a given level of confidence, $a1$; converting it to an odds score, o, where $o = a1 / (1 - a1)$; and then computing suspect-ID accuracy, 100% × $a2$, using the formula $a2 = o / (o + 1 / n)$, where n = lineup size. An example showing how this works is presented in Appendix B. Figure 4 does not show error bars because it was not possible to compute them when the data were estimated. However, an aggregate plot presented later in Figure 5 provides an indication of the consistency across studies. Note that most of the studies on the confidence-accuracy relationship that reported only the point-biserial correlation could not be included in our review because there is no way to produce a CAC plot when all that is known is a correlation coefficient. Overall, four studies that originally reported a point-biserial correlation coefficient were considered here: the three studies shown in Figure 3 and the study by Read et al. (1998) shown in Figure 4n. As noted above, it was possible to include these studies because J. Don Read still had (and provided us with) the raw data.

Most of the studies we review reported data from multiple conditions, so for each study shown in Figure 4, we have plotted the results from the individual conditions on the left and the results aggregated across conditions on the right. The results are presented alphabetically by first author, except for the D. S. Lindsay et al. (2000) and Sauerland and Sporer (2009) studies, which are both shown in the final panel (Fig. 4s) because they had only one condition each. Figure 4b is based on the same data we used earlier to illustrate calibration curves for choosers (Fig. 2a). Generally speaking, the average plots on the right for the studies with multiple conditions in Figure 4 are representative of the individual-condition plots on the left, so the bottom-line story from those studies can be most easily appreciated by scanning the plots on the right. It is visually apparent that in most cases, high-confidence accuracy is very high (95%–100% correct), whereas low-confidence accuracy is obviously lower.

Fifteen of the relevant studies reported their data on a 100-point confidence scale. Most reported their results using the following scale: 0–20, 30–40, 50–60, 70–80, and 90–100. In a few studies, a 6-point scale was used consisting of 0%, 20%, 40%, 60%, 80% and 100% confidence. For those, we collapsed the 0% and 20% ratings together to create a 5-point scale so the data could be averaged with data from the other studies using a 100-point scale. Across those 15 experiments, the average accuracy of a low-confidence (0–20) ID was 63.7% correct (range = 37.5%–83.3%), whereas the average accuracy of a high-confidence (90–100) ID was 97.1% correct (range = 94.2%–99.7%). The resulting aggregate CAC curve is shown in Figure 5a.

Overall, the data from the calibration studies reviewed here tell the same story as the data from the experiments included in the original Sporer et al. (1995) meta-analysis that we were able to reanalyze (Fig. 3). Confidence is highly predictive of accuracy in the straightforward sense that low-confidence suspect IDs are error prone (though often well above 50% chance, so such IDs are somewhat probative of guilt) whereas high-confidence suspect IDs are largely, but not perfectly, accurate. Moreover, these data indicate that, with respect to suspect-ID accuracy, eyewitnesses are, if anything, *under*confident (not overconfident). Note that all of these studies were methodologically similar to the earlier studies that were reviewed by Sporer et al. (1995), which are the studies that have helped to convince the legal system to increasingly disregard eyewitness confidence. What differs is how the data are analyzed, and that difference changes the story of the relationship between eyewitness confidence and accuracy as it is currently understood by the legal system (based largely on the point-biserial approach).

Figure 5b shows the average calibration plot (counting filler IDs from target-present lineups as errors). Although the data shown in Figure 5a are of most interest to judges and juries, the data shown in Figure 5b are certainly of interest to scientists. This plot is relevant to the question of how well eyewitnesses can express confidence in a way that corresponds to their subjective impression of accuracy. Any viable theory of eyewitness confidence would have to accommodate these data as well. Remarkably, the data exhibit almost perfect calibration (cf. Juslin et al., 1996).

Unfair lineups

As indicated earlier, our conclusions about the relationship between confidence and accuracy apply to initial IDs made from fair lineups without undue influence from a lineup administrator. A fair lineup is one in which everyone in the lineup resembles the perpetrator to the same approximate degree, so the suspect would not be identified more often than chance by a group of mock witnesses provided with the perpetrator's description.

The situation is undoubtedly different when unfair lineups are used. An unfair lineup is one in which the suspect stands out from the fillers such that the suspect

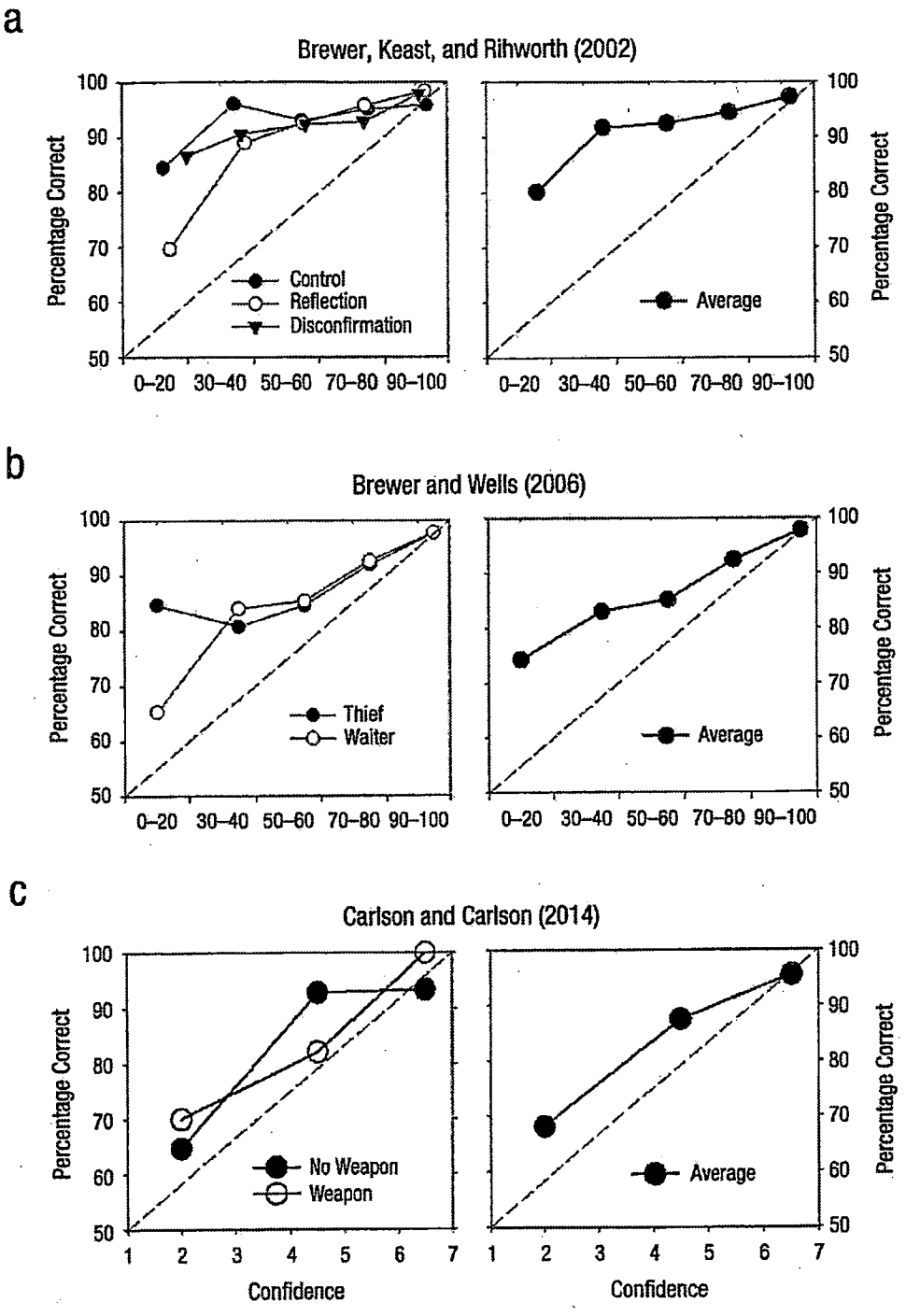


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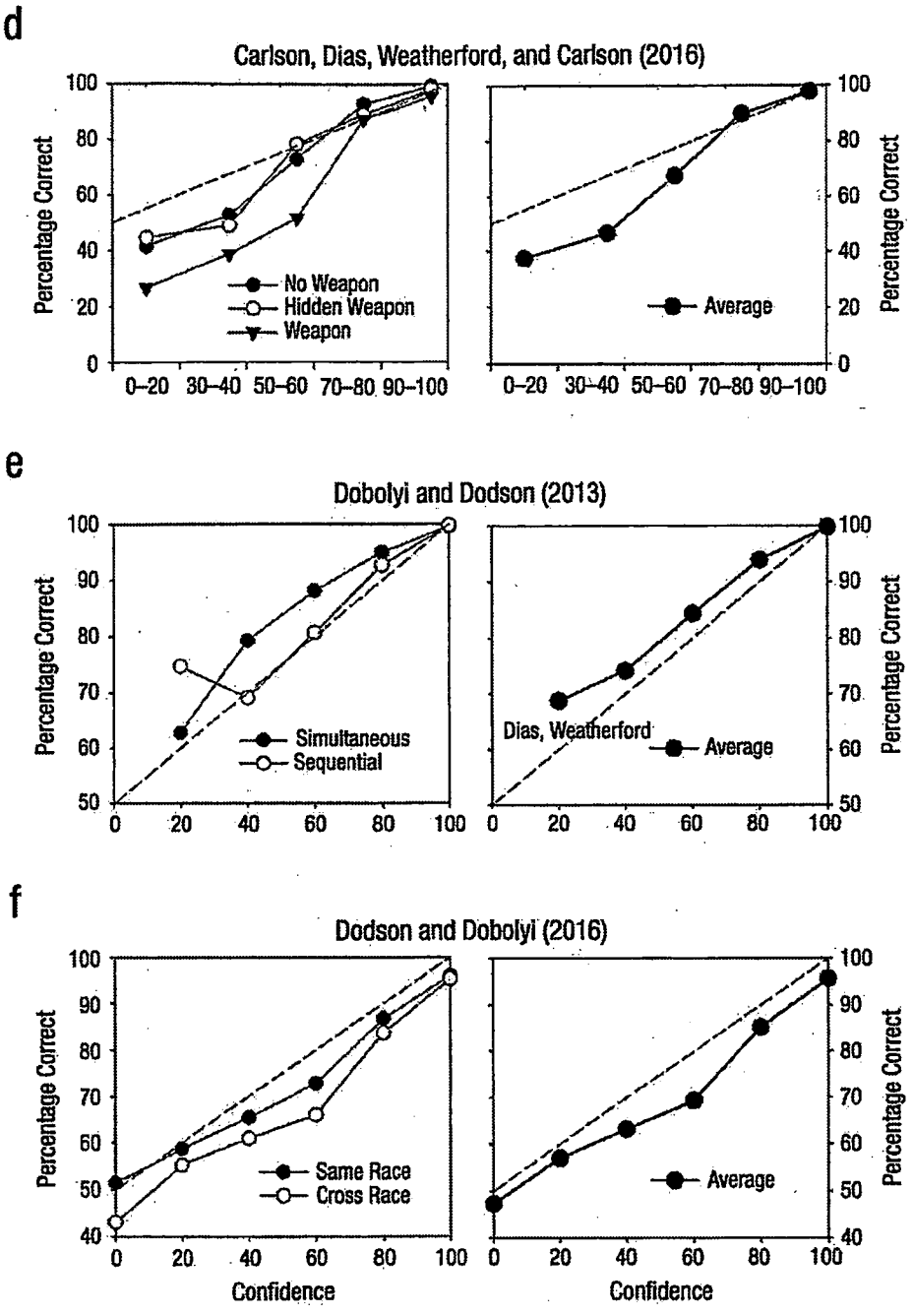


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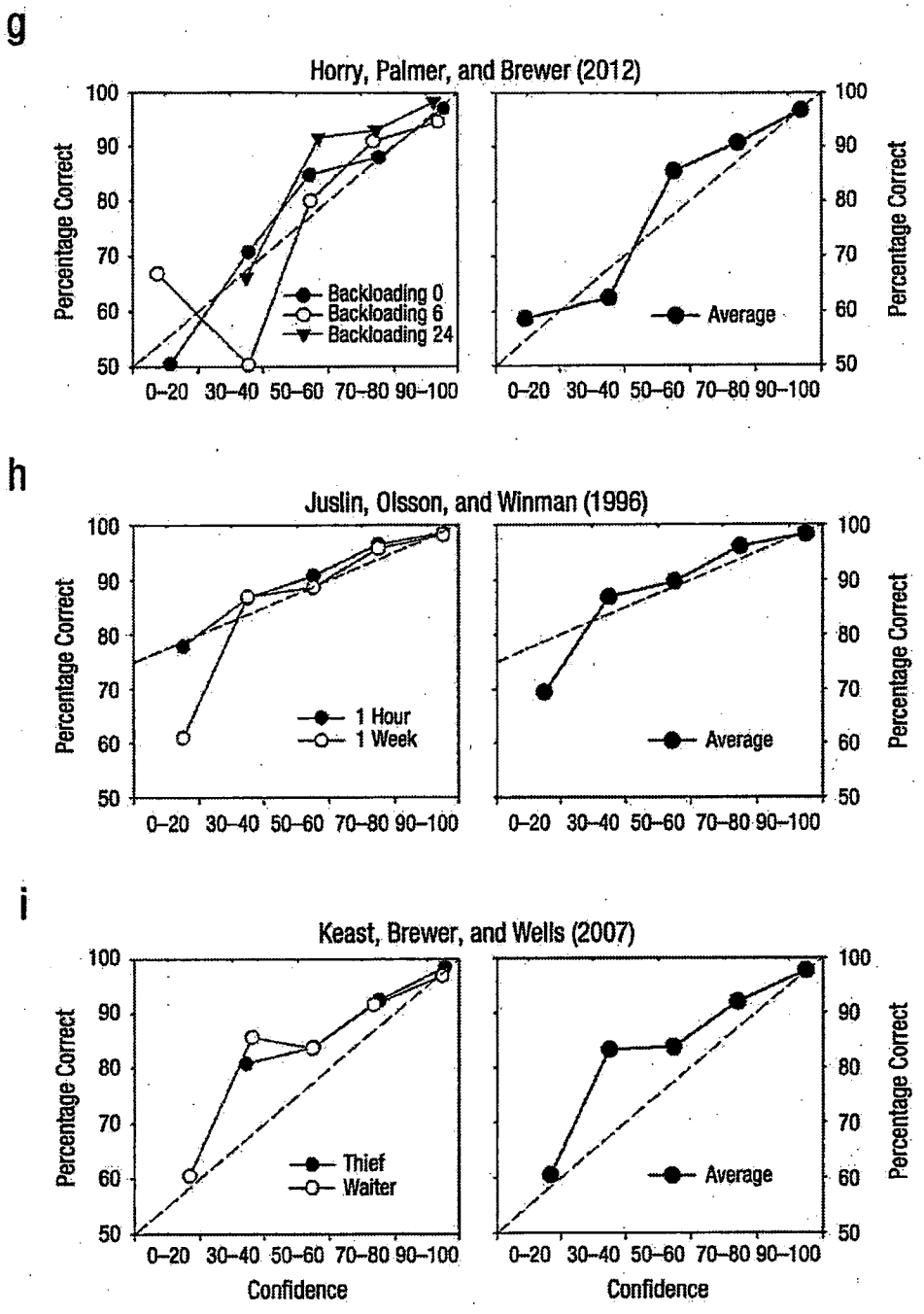


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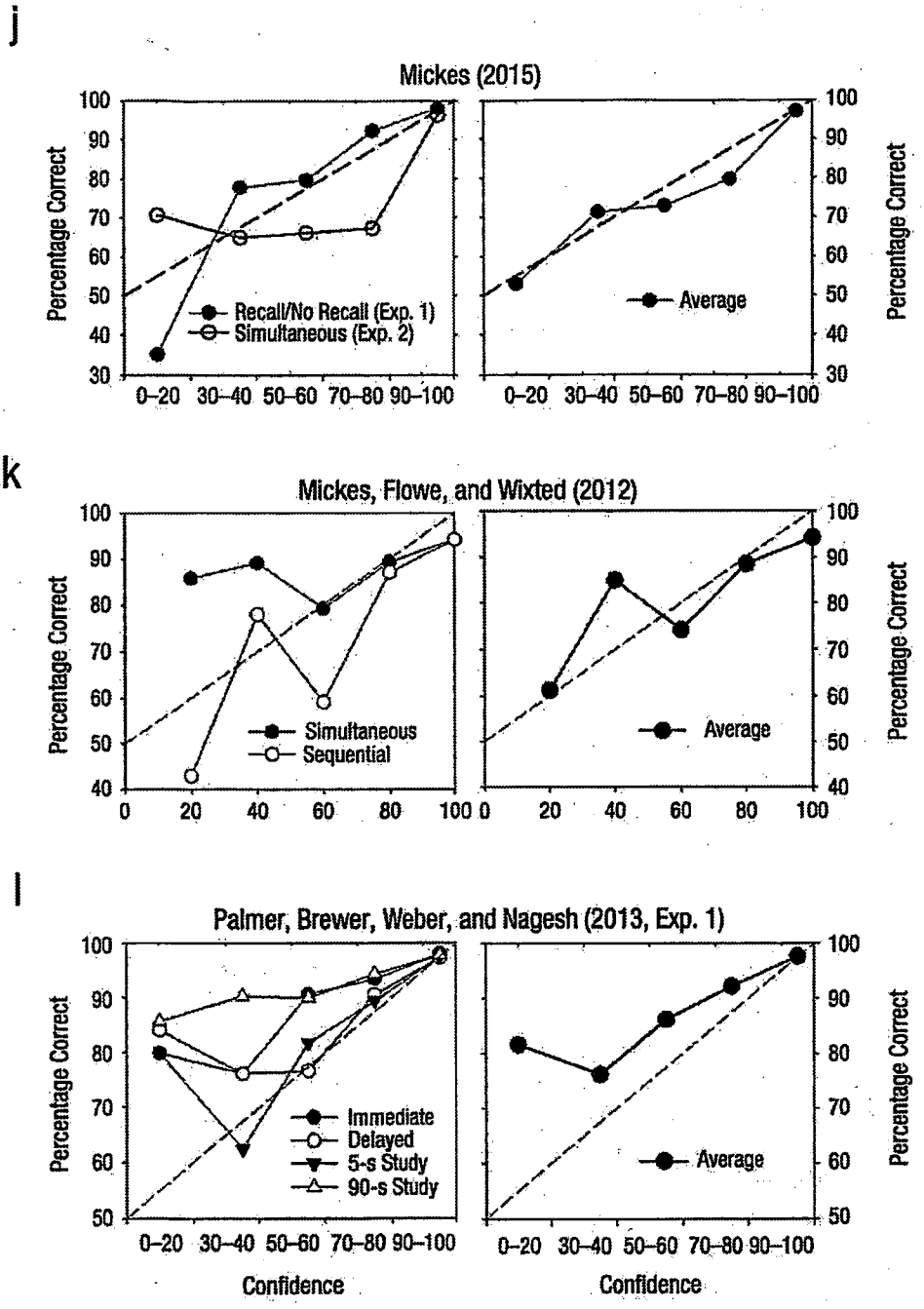


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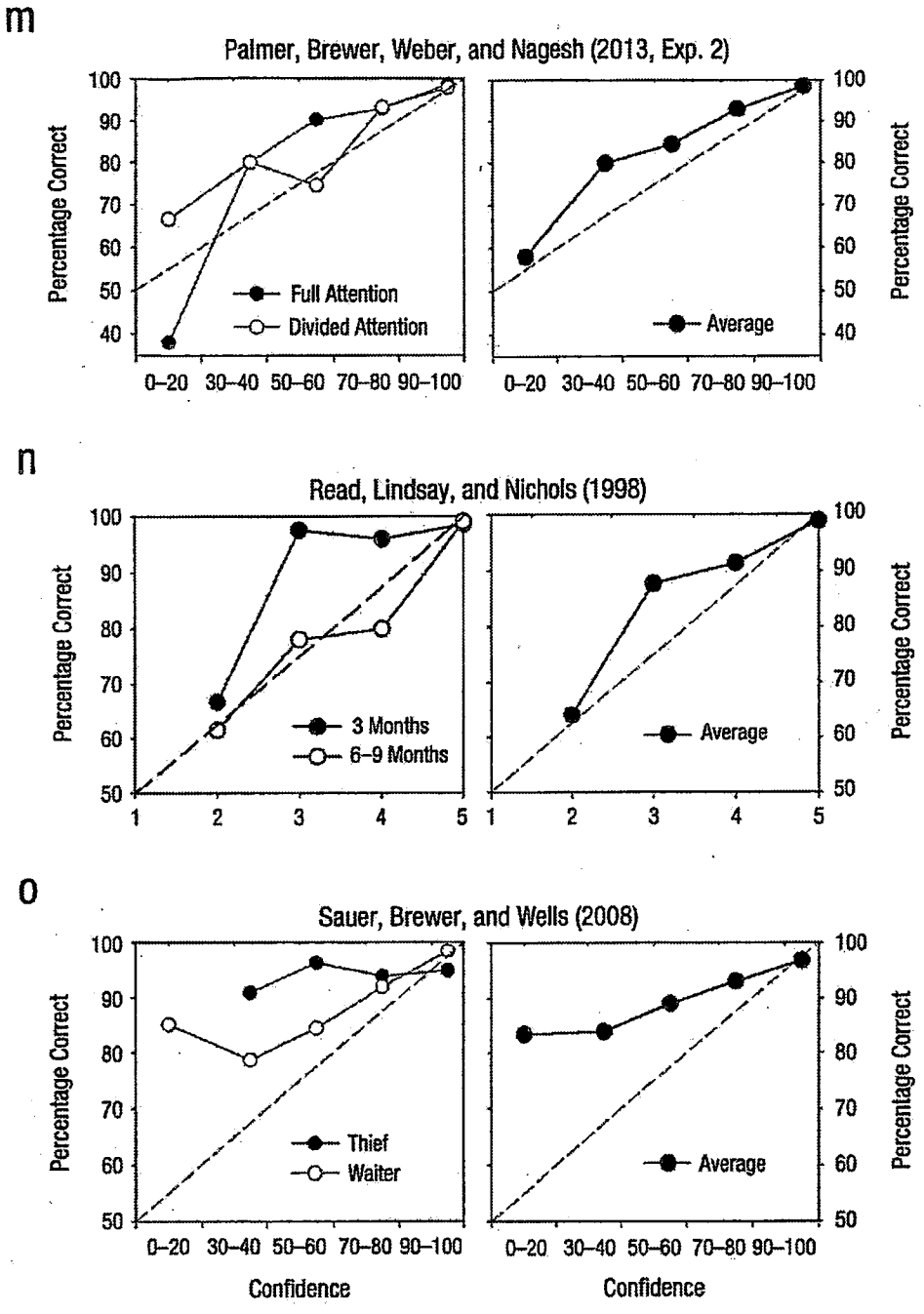
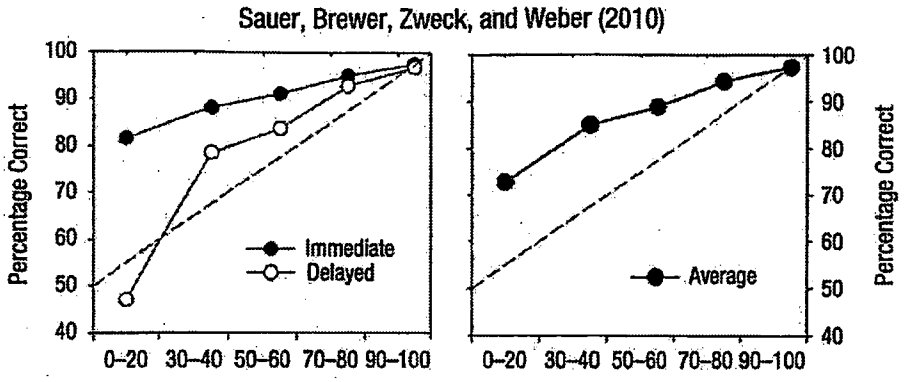
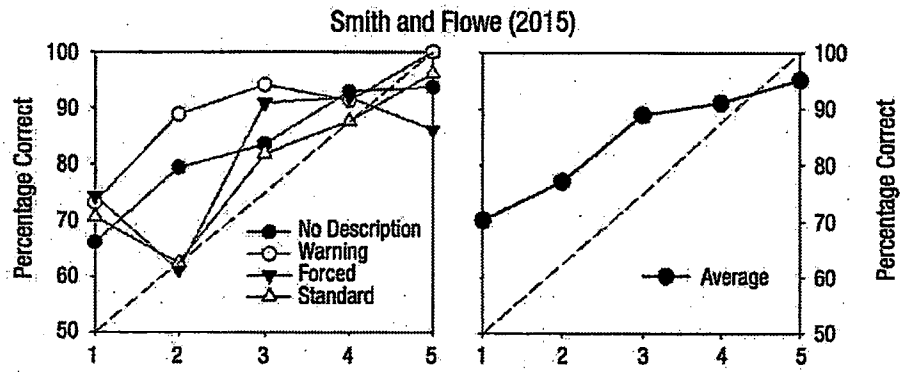


Fig. 4. (continued)

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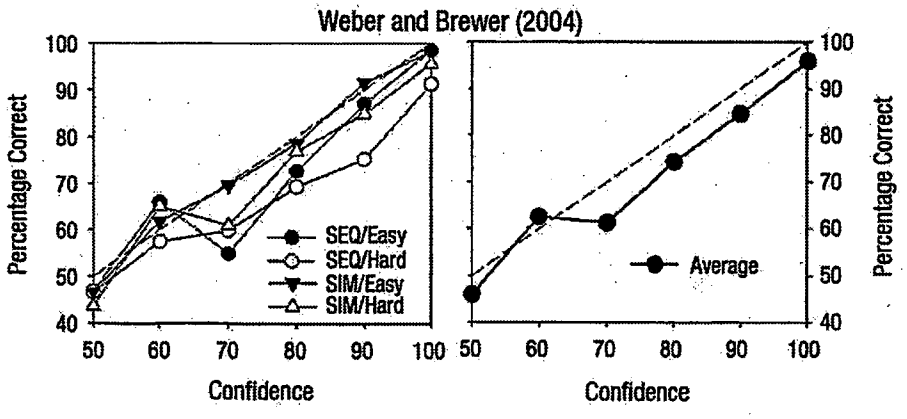


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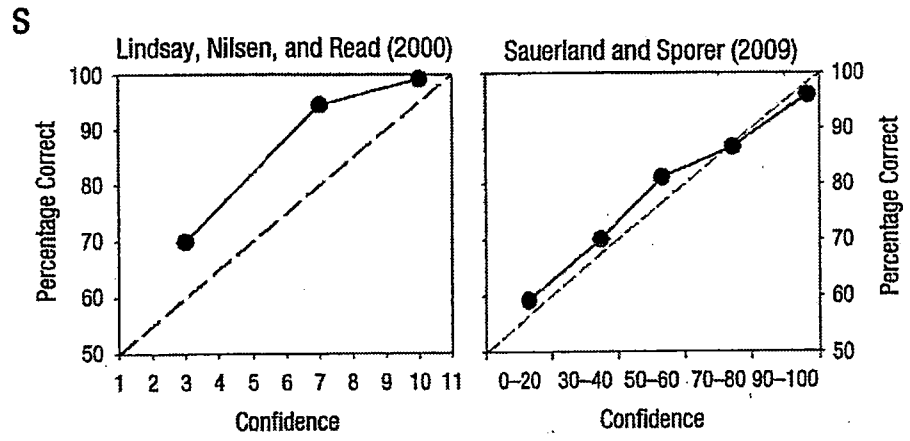


Fig. 4. Suspect-ID accuracy (percentage correct) as a function of confidence for the 20 studies listed in Table 1. SEQ = sequential; SIM = simultaneous.

(innocent or guilty) resembles the perpetrator to a noticeably greater extent than the fillers. It is well known that an unfair lineup leads to a higher rate of suspect identification and higher confidence in that identification, whether or not the suspect is the perpetrator (Fitzgerald, Price, Oriet, & Charman, 2013; R. C. L. Lindsay & Wells, 1980; Wells, Rydell, & Seelau, 1993). It stands to reason that unfair lineups would also reduce the utility of eyewitness confidence and would decrease the reliability of high-confidence IDs. In the extreme, placing the perpetrator's identical twin in a target-absent lineup would undoubtedly yield many incorrect high-confidence IDs of the innocent suspect, wreaking havoc on the accuracy of high-confidence suspect IDs.

Gronlund, Carlson, Dailey, and Goodsell (2009) conducted a large-scale investigation into the diagnostic accuracy of simultaneous and sequential lineups using target-absent lineups in which the designated innocent suspect resembled the perpetrator more than the fillers did. They also varied how much the picture of the guilty suspect resembled what the perpetrator looked like while committing the crime. In some conditions of that experiment, performance was near chance (e.g., when the perpetrator's appearance had substantially changed and the

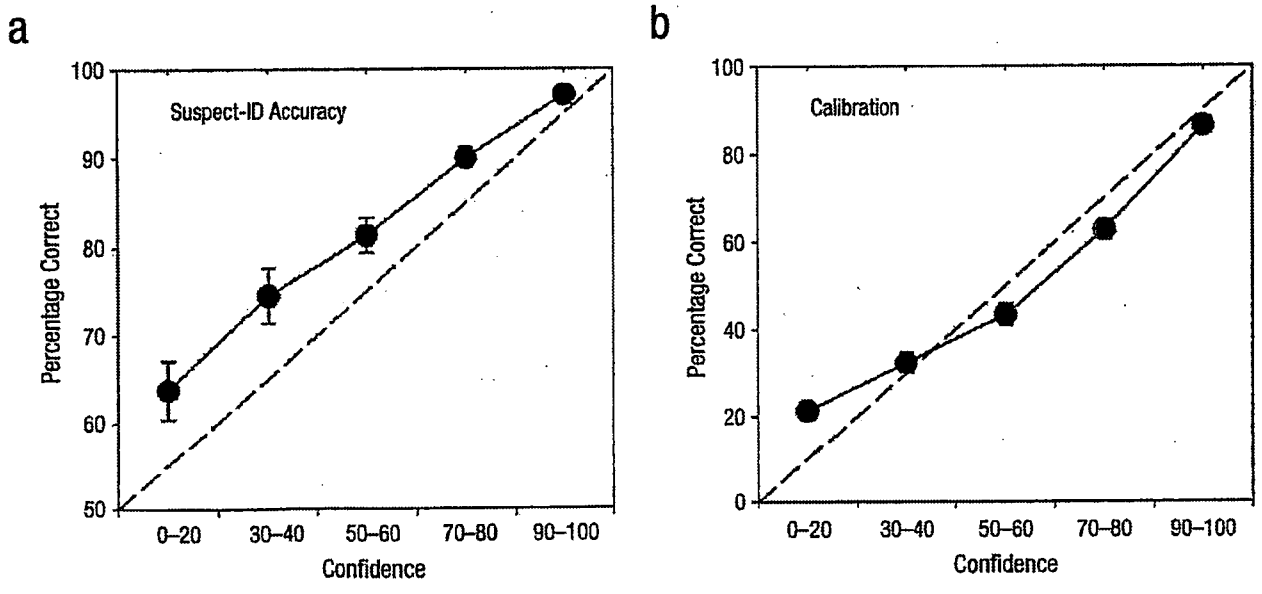


Fig. 5. Suspect-ID accuracy averaged across 15 studies with comparable scaling on the confidence (*x*-) axis (a), and the same data plotted as a calibration curve (b). The studies included in this analysis, which all used a 100-point confidence scale, are indicated in Table 1 with an asterisk.

innocent suspect looked a lot like the original view of the perpetrator). In other conditions, performance was above floor, and Gronlund et al. (2012) reported confidence-based ROC data for those conditions. Collapsed across simultaneous and sequential lineups, the target-absent lineups from the conditions they analyzed were still unfair in the sense that the innocent suspect more closely resembled the perpetrator than the fillers did (so the innocent suspect was identified with much higher probability than the individual fillers were). Thus, these data can be used to gain some insight into the confidence-accuracy relationship when unfair lineups are used. Figure 6a presents the CAC plots for simultaneous and sequential lineups from Gronlund et al. (2012). The data exhibit a strong relationship between confidence and accuracy, but high-confidence accuracy (88% correct) is noticeably lower than it has been for the fair lineups considered to this point. The lower accuracy score for high-confidence IDs presumably reflects the impact of lineup unfairness. Note that the other conditions in their experiment, which yielded chance performance (because in some cases the photo of the innocent suspect resembled the perpetrator more than the photo of the guilty suspect did) would clearly wreak havoc on the confidence-accuracy relationship.

A clear illustration of the effect of unfair lineups can be observed by analyzing some of the data reported by Mickes, Flowe, and Wixted (2012). In their Experiment 2, the innocent suspect in the target-absent lineups was an altered photo of the perpetrator himself. The perpetrator's photo was altered using Photoshop to change the hair color, skin tone, nose shape, and face shape. Because these changes were all relatively minor, this experiment approximated a situation in which target-absent lineups contained a near twin of the perpetrator. As might be expected, the researchers' ROC analyses indicated that overall performance was rather poor. For simultaneous lineups, the overall correct-ID rate was .50 and the false-ID rate was .26 ($d' = 0.63$). For sequential lineups, the correct-ID rate was .42 and the false-ID rate was .22 ($d' = 0.55$). Of more interest for present purposes are the CAC plots shown in Figure 6b. Obviously, the relationship between confidence and accuracy is weaker than what is observed for fair lineups. Perhaps even more importantly, high-confidence suspect-ID accuracy is quite low (near 70% correct for simultaneous lineups and sequential lineups). As noted earlier, Sučić et al. (2015) also arranged unfair lineups, and the data from that study (expressed as a CAC plot) are shown in Figure 6c. Once again, high-confidence accuracy (only 85% correct) falls well below what is typically observed when fair lineups are used.

Two recent studies are particularly informative because they directly compared fair versus unfair lineups. Wetmore et al. (2015) tested participants using six-person simultaneous lineups either immediately after watching a mock-crime video or following a 48-hour delay. In their conditions in which the innocent suspect had only moderate similarity to the perpetrator (what they referred to as the "InnocentWeak" condition), some lineups were fair and others were biased against the innocent suspect. Their Table 2 presented choosing rates for the designated innocent suspect in each condition (fair vs. biased), so it was possible to determine that their manipulation of lineup fairness was successful. That is, the innocent suspect was disproportionately chosen over the other fillers in the biased condition only. Figure 6d presents the CAC results from that study collapsed across the retention-interval manipulation. As would be expected, the data from the fair condition are similar to the data presented earlier in Figure 4. Specifically, confidence is a strong predictor of accuracy, and high-confidence accuracy is very high (100% correct for confidence ratings of 7; 96% correct for confidence ratings of 6). However, in the biased condition, high-confidence accuracy is far lower (80% correct for confidence ratings of 7; 75% correct for confidence ratings of 6).

A similar pattern was evident in a recent study by Colloff, Wade, and Strange (2016). Participants watched a video of a perpetrator who had a distinctive feature, such as a black eye. In the unfair condition, the distinctive feature appeared only on the suspect in both target-present and target-absent lineups, not on any filler. Thus, whether innocent or guilty, the suspect stood out. In their fair conditions, by contrast, the distinctive feature either was present on all lineup members or was covered up for all lineup members (the data from several conditions in which the distinctive feature was added to or eliminated from all lineup members were very similar and have been averaged together here). As is apparent in Figure 6e, for the unfair condition, high-confidence accuracy was very low (~66% correct) and was much lower than high-confidence accuracy in the fair conditions (~86% correct). Although the effect of lineup fairness on high-confidence accuracy was consistent with other findings, high-confidence accuracy in the fair condition was noticeably lower than the ~95% correct levels of accuracy typically observed in the other studies reviewed here (e.g., Fig. 5a). Because there is no obvious reason for the observed difference, this result serves as a reminder that the determinants of high-confidence accuracy are not fully understood and that more research is needed to identify the conditions under which high-confidence accuracy can be compromised even when fair lineups are used.

These findings underscore the critical point that our claims about the relationship between confidence and accuracy (and, in particular, the very high level of accuracy usually associated with high-confidence suspect IDs) apply to fair lineups, not to unfair lineups. As noted by

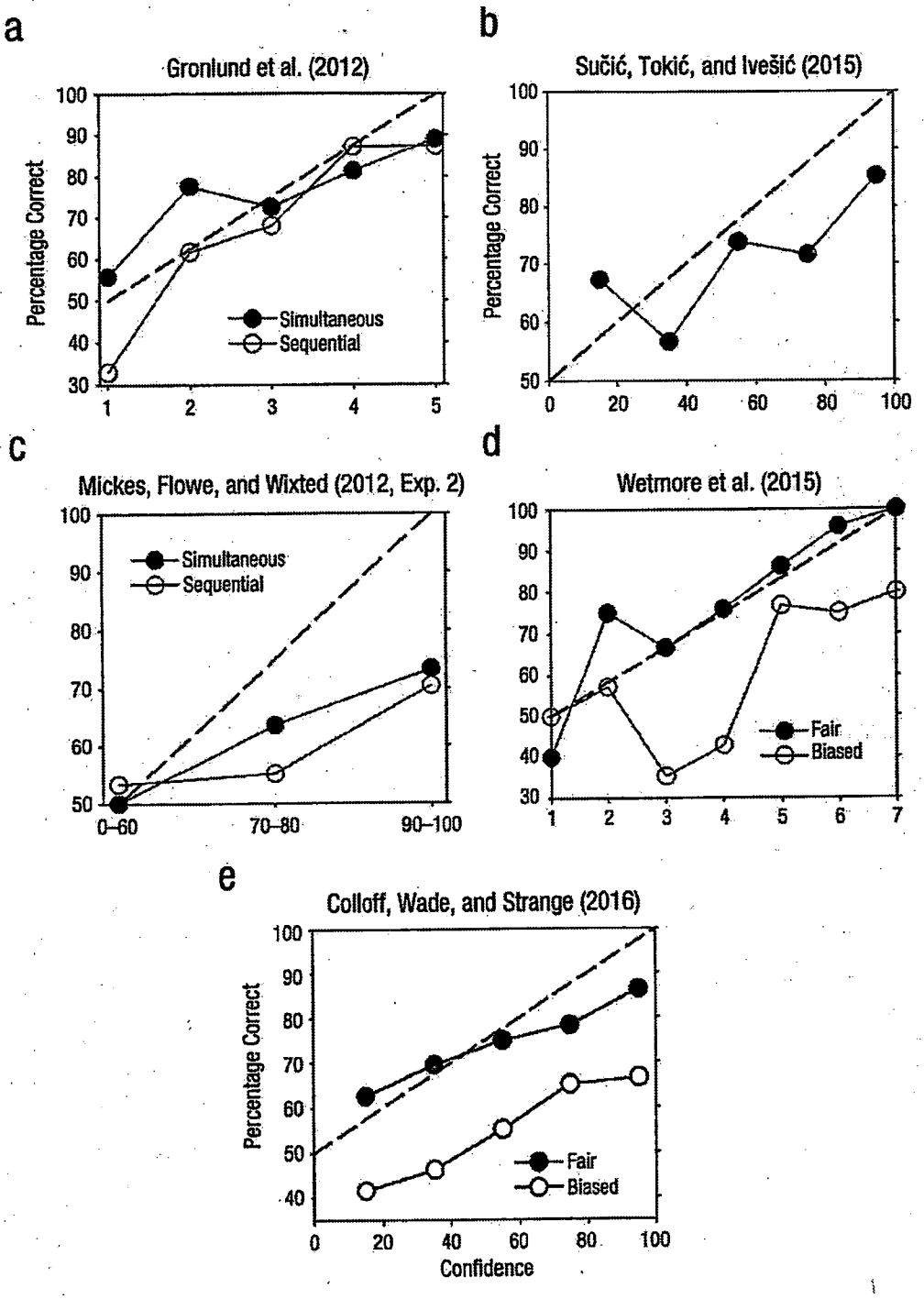


Fig. 6. Confidence-accuracy characteristic plots from studies that used unfair lineups.

Brewer and Palmer (2010), other circumstances in which the confidence-accuracy relationship may be degraded include (a) when the eyewitnesses are children (e.g., age 13 or younger), (b) when confidence ratings are not taken contemporaneously with the ID but are instead retrospective, and (c) when witnesses reject the lineup.

Police Department Field Studies

The advantage of a mock-crime study such as the ones considered above is that the experimenter knows if a suspect ID is correct or incorrect, thereby allowing a direct computation of suspect-ID accuracy. In a police department field study, by contrast, it is not known if a suspect ID is correct or incorrect. Thus, although one can measure how often high-confidence and low-confidence IDs are made to suspects and fillers, a direct calculation of suspect-ID accuracy as a function of confidence is not possible. Nevertheless, indirect information about suspect-ID accuracy as a function of confidence can be obtained if (a) the perpetrator is a stranger to the witness (so the suspect in the lineup is not chosen because of preexisting familiarity), (b) the lineup is fair (so the suspect is not chosen because he or she stands out), and (c) blind administration is used (so the suspect is not chosen by the witness because of administrator influence). Under those conditions, the only way that the witness can land on the suspect with a probability that exceeds $1/n$, where n is lineup size, is if the suspect matches the memory of the witness. Except in rare cases in which an innocent suspect bears an uncanny resemblance to the perpetrator despite the fact that the lineup procedure was pristine, a strong memory-match signal would usually happen because the suspect actually is the perpetrator. Thus, if confidence is predictive of accuracy in the real world, suspect IDs should occur with probability greater than $1/n$, and that probability should increase as a function of confidence. To our knowledge, only two police department field studies have used fair lineups that were blindly administered and also reported confidence data. Both of these studies yielded data suggesting that high-confidence IDs are highly reliable, whereas low-confidence IDs are much less reliable (just as the lab data summarized in Fig. 5a would suggest).

Hennepin County police department field study

Klobuchar, Steblay, and Caligiuri (2006) conducted a pilot study of 206 actual eyewitnesses who were tested using six-person sequential photo lineups in four municipal police departments in Hennepin County, Minnesota. The lineups were not specifically tested for fairness but were presumably fair because department policy required the use of photographs depicting individuals of similar age, skin color, complexion, hairstyle, and build. The lineups were administered by an officer who was blind to the suspect's identity, and confidence was recorded in the witness's own words. Some lineups contained a suspect previously known to the witness, whereas other lineups contained a suspect previously unknown to the witness. The key measure was the frequency of *jump-out IDs*, which are rapid IDs accompanied by expressions of absolute certainty. In other words, jump-out IDs are high-confidence IDs.

Of 175 choosers in this study, 96 (55%) made jump-out IDs. Remarkably, 99% of these IDs were made to suspects, not fillers, which is to say that only one of the 96 jump-out IDs was made to a filler. From their Table 5, it was possible to determine that 26 of the jump-out IDs were made to strangers, and 70 were made to suspects previously known to the eyewitness. The stranger data are of interest here. The one jump-out ID that landed on a filler occurred in a stranger lineup (Nancy Steblay, personal communication, April 25, 2016); thus, 25 out of 26 jump-out IDs in stranger lineups (96%) landed on the suspect.

Keep in mind that there were 5 times as many fillers as suspects in any given lineup, so random responding for jump-out IDs would result in $26 \times (5 / 6) \approx 22$ filler IDs (yet only one was actually observed) and only about $26 \times (1 / 6) \approx 4$ suspect IDs (yet 25 were actually observed). Thus, the number of suspect IDs made with high confidence in this study was far greater than would be expected by chance. It is possible that the lineups in the Hennepin County study were not fair lineups. But if they were fair lineups (as they were designed to be), it is hard to come up with a logical explanation for these results without assuming that high-confidence accuracy was close to perfect. IDs made with lower confidence in that study (non-jump-out IDs) landed on the suspect much less often, approximately 60% of the time. That is still much more often than would be expected by chance alone, so even these more error-prone suspect IDs appear to be somewhat probative of guilt. These results suggest a strong confidence-accuracy relationship that is not appreciably different from that revealed by the lab results depicted in Figure 5a.

Houston Police Department field study

Another recent police department field study was specifically designed, in part, to examine the information value of eyewitness confidence (Wixted et al., 2016). In this study, eyewitness decisions were recorded from six-person photo lineups administered as part of criminal investigations in the Robbery Division of the Houston Police Department between January 22 and December 5, 2013. This study involved the administration of 348 simultaneous and sequential lineups, the investigators were unaware of the identity of the suspect in each lineup (i.e., double-blind administration was used), and the lineups involved suspects who were unknown to the eyewitnesses prior to the crime. Lineup fairness was examined for a random sample of 30 photo lineups by providing

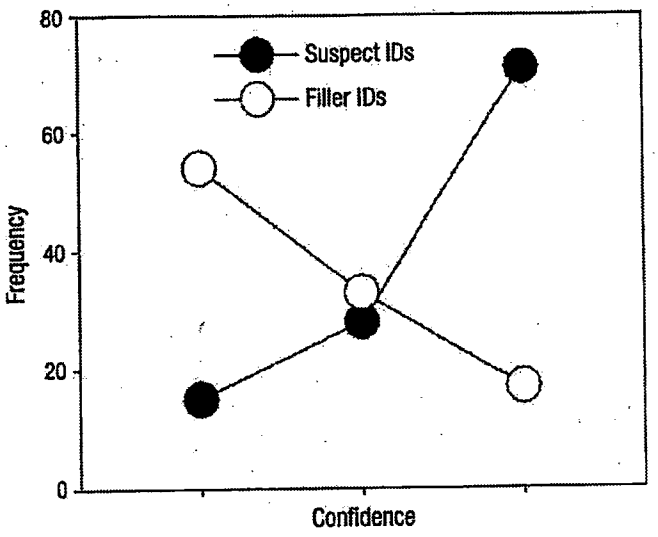


Fig. 7. Suspect IDs and filler IDs made with low, medium, and high confidence in the Houston Police Department field study (Wixted, Mickes, Clark, Dunn, & Wells, 2016).

the selected photo lineups to 49 mock witnesses and asking them to try to identify the suspect based only on the suspect's physical description. As noted above, in a fair six-person lineup, the suspect should be identified by a mock witness only 1/6 (.17) of the time. The mean proportion of suspect IDs made by the mock witnesses (.18) did not differ significantly from the expected value for a fair six-member lineup, $t(29) = 0.76$. Thus, according to this measure, the 30 lineups that were randomly selected were, on average, fair. For purposes of our analyses, we assumed that the remaining lineups were also fair. Eyewitnesses who made a suspect ID or a filler ID were asked to supply a confidence rating on a 3-point scale (*positive, strong tentative*, or *weak tentative*).

The critical results are reproduced in Figure 7. Obviously, most suspect IDs were made with high confidence, whereas most filler IDs were made with low confidence. This pattern again immediately suggests a strong confidence-accuracy relationship. Moreover, as with Klobuchar et al. (2006) and in agreement with lab studies (Fig. 5a), high-confidence IDs appear to have been highly accurate. Even though there were 5 times as many fillers as suspects in the police lineups used in this study, high-confidence IDs landed on the suspect 72 times and landed on a filler 17 times. Using perfectly fair lineups, one would expect 5 times as many high-confidence filler IDs as high-confidence suspect IDs. Thus, as a crude approximation, the 17 high-confidence filler IDs translate to an estimated $17 / 5 \approx 3$ high-confidence innocent-suspect IDs. If three of the 72 high-confidence suspect IDs were made to innocent suspects, it means that 69 of the 72 suspect IDs made with high confidence (96%) were correct. A formal signal-detection model fit to these data estimated high-confidence suspect-ID accuracy to be approximately 97% correct, whereas low-confidence suspect-ID accuracy was estimated to be closer to 50% correct. Again, these results are not dramatically different from the lab results summarized in Figure 5a.

Base Rates of Target-Present Lineups in the Laboratory and in the Real World

In most of the lab studies that we have considered here, the base rate of target-present lineups was 50%. An issue in generalizing from the lab to the real world is that the base rate of target-present lineups is unknown, and it is quite likely that the base rate will vary from one police department to another, or even from one detective to another, as a function of how much evidence an investigator requires before placing a possible suspect in a lineup (Wells, 1993). In order to explore the effect of different base rates, we used the data from Wetmore et al.'s (2015) fair lineups. Figure 6d showed a CAC on these data based on a 50% base rate. We created Bayesian curves called *prior-by-posterior curves* that map the probability that an identification of the suspect was accurate (i.e., that the suspect is the perpetrator) across all possible values of the base rate from 0% (all lineups had an innocent suspect) to 100% (all lineups had a guilty suspect). See Appendix C for a short tutorial on this

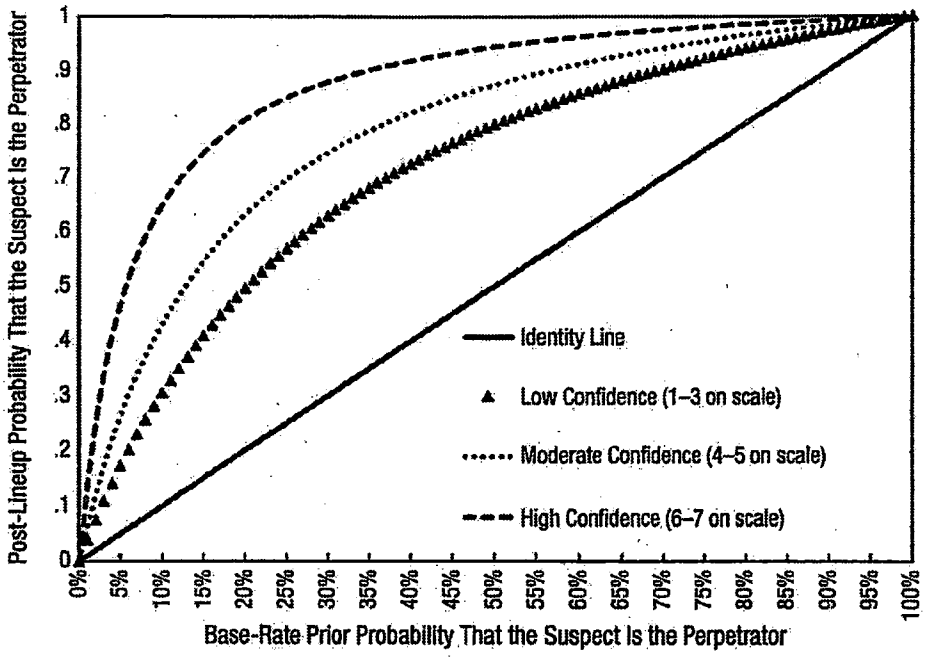


Fig. 8. Post-lineup probability that the suspect is the perpetrator as a function of the base rate of target present lineups and whether the ID was made with low, moderate, or high confidence. The data are from Wetmore et al.'s (2015) fair lineups.

Bayesian approach. With a sufficiently large sample size, we can create a curve for every level of confidence. But, because sample sizes can get small when every level of confidence is examined separately, we used three levels of confidence. The Wetmore et al. study used a 7-point confidence scale, so we collapsed confidence ratings of 1 through 3 into the category of low confidence, 4 and 5 into moderate confidence, and 6 and 7 into high confidence. These curves are shown in Figure 8.[2]

The solid line in Figure 8 is called an *identity line*, and it simply represents where the data would fall if the identification had no diagnostic utility. Clearly, all three curves are above the identity line and, as would be expected, the height of the curve for the high-confidence eyewitnesses is far above that of the curves for the moderate- and low-confidence witnesses.

Notice that the probability that the identified suspect is the perpetrator (which is the same as the probability that the witness is accurate) for high-confidence eyewitnesses remains relatively high (above 90%) until the base rate drops below 35%. Contrast that, however, with low-confidence witnesses, for whom the accuracy drops below 90% as soon as the base rate drops below 70%. In fact, whereas the high-confidence witnesses are still 90% accurate when the base rate is a mere 35%, the low-confidence witnesses drop all the way to a mere 63% accuracy if the base rate is 35%.

The data in Figure 8 underscore an important point made by Wells et al. (2015), namely that the base rate matters. Moreover, the base rate for lineups is a system variable. If a police department places a suspect who matches the perpetrator's description in a lineup on nothing more than a hunch, then the base rate of guilt in that jurisdiction is likely to be on the low side. Requiring at least some independent evidence of guilt (i.e., requiring more than just a hunch) will move a jurisdiction to the right on the base-rate dimension in Figure 8, thereby increasing the probability that an identification of a suspect is an accurate identification for all IDs made with any level of confidence.

What does law enforcement believe about the need to have evidence indicating that the suspect is likely to be the perpetrator before placing a suspect in the jeopardy of a lineup? A national survey indicated that more than one-third of U.S. crime investigators believed that they needed no evidence at all about the likely guilt of a person before placing that person in a lineup (Wise, Safer, & Maro, 2011). Behrman and Richards (2005) examined records from 306 lineups in Northern California in which a witness identified someone. They then coded how much evidence existed against the suspects before they were placed in a lineup. Behrman and Richards found that in 30% of the cases the evidence was "minimal," and in an additional 40% of the cases there was no pre-lineup

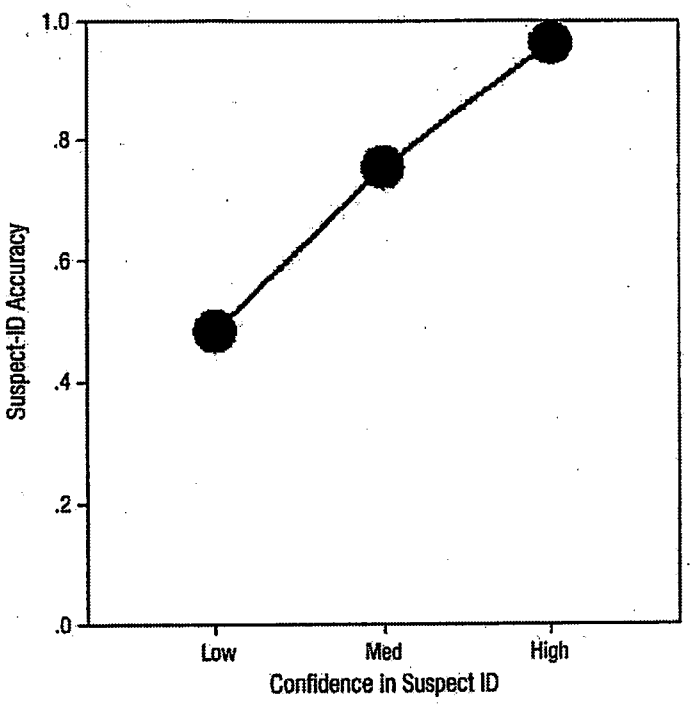


Fig. 9. Estimated suspect-ID accuracy as a function of confidence for the data from the Houston Police Department field study (Wixted Mickes, Clark, Dunn, & Wells, 2016). The estimates were based on a signal-detection model, which further estimated the target-present base rate of lineups to be 35%.

evidence at all. This does not tell us directly about what the base rates are in those jurisdictions, but it does not lend much confidence toward the idea that the base rate is high.

The base rate of guilt in lineups is generally assumed to be an unknowable variable in the real world. However, the signal-detection model used by Wixted et al. (2016) provided a principled estimate of the base rate in the Houston Police Department. The base-rate estimate that Wixted et al. reported—35%—is just that, an estimate, so it could be wrong. However, it is a principled estimate because it is based on a theory that has long guided thinking about recognition memory in other contexts. Moreover, it is a demonstration that, with the right theory, the base rate of guilt in a particular jurisdiction is not necessarily an unknowable value. The signal-detection model used by Wixted et al. (2016) may not be the right theory. And recall that the theory giving rise to this estimate assumed that the lineups were fair lineups based on an analysis of only a subset of the lineups. But the point is that base-rate information is not inherently unknowable, and the first principled estimate in a police jurisdiction came out surprisingly low. Fortunately, using pristine identification procedures, the laboratory data shown in Figure 8 suggest that, at a base rate of only 35%, confidence is highly predictive of suspect-ID accuracy, and high-confidence IDs are still quite accurate (about 90% in Fig. 8), whereas low-confidence IDs, despite having probative value, are highly error prone. Similarly high accuracy was obtained when the signal-detection model was used to estimate suspect-ID accuracy in the Houston field study assuming a 35% base rate of target-present lineups (Fig. 9). However, if the true base rate were much lower than that, then high-confidence IDs would begin to become highly error prone as well. Moreover, base rates likely differ from jurisdiction to jurisdiction, which means that some may fall well below the 35% estimate in Houston. Thus, conceptualizing the base rate as a system variable—and taking concrete steps to increase it—seems like a prudent strategy for law enforcement to consider.

Filler IDs and Non-IDs

In a police lineup, there are three possible decision outcomes: a suspect ID, a filler ID, and a non-ID (a rejection). To this point, we have focused on suspect IDs because those IDs are the ones that have often ended up putting an innocent person in prison, only to be exonerated by DNA evidence years later. Wells et al. (2015),

however, pointed out that the other two decision outcomes—filler IDs and rejections—also provide useful information about the chances that the suspect is the perpetrator. Unlike identifications of the suspect, however, the information value of rejections and of filler identifications is exculpatory rather than incriminatory.

The fact that rejections provide exculpatory information is somewhat obvious and stems from the simple observation that witnesses are more likely to reject the lineup (make a non-ID decision) if it is a target-absent lineup than if it is a target-present lineup. But it is somewhat more difficult to intuit that filler IDs also provide exculpatory information. Empirically, it has long been recognized that filler identifications are more likely to occur in response to target-absent lineups than in response to target-present lineups (Wells & Lindsay, 1980). Accordingly, it makes sense that filler identifications would have exculpatory value. In effect, a witness who identifies a filler is offering an opinion that there is a filler in the lineup who looks more like the perpetrator than does the suspect. And, of course, that means that filler IDs are more likely to happen when the suspect is not the perpetrator than when the suspect is the perpetrator (Wells et al., 2015).

The information that rejections and filler identifications provide can be expressed at different levels of witness confidence using prior-by-posterior curves just as we did with identifications of the suspect. Prior-by-posterior curves for rejections are shown in Figure 10a, and the curves for filler identifications are shown in Figure 10b using the data from Wetmore et al. (2015). The dependent measure in Figures 10a and 10b is the probability that the lineup is a target-present lineup (i.e., that the suspect is the perpetrator). Notice that, unlike identifications of the suspect (see Fig. 8), both rejections and filler identifications produce curves that fall below rather than above the identity (no information) line. That is because both rejections and filler identifications have exculpatory information value rather than incriminatory information value.

In the case of rejections, which are shown in Figure 10a, the vertical axis is equivalent to the proportion of witnesses who made a correct decision to not identify anyone from the lineup. As can be seen, high-confidence rejections produce a curve that is farther below the identity line than the lines produced by moderate- or low-confidence rejections. This reinforces an important point, namely that lineup administrators should be obtaining confidence statements from witnesses for rejection decisions at the time of identification in addition to collecting confidence statements for identifications of suspects.

In the case of filler identifications, which are shown in Figure 10b, the vertical axis does not represent the proportion of witnesses who made a correct decision. After all, all filler identifications are errors. Nevertheless, filler identifications have information value because a filler identification is more likely to occur when the suspect is not the perpetrator (target-absent lineup) than when the suspect is the perpetrator (target-present lineup). Notice that the exculpatory value of filler identifications can be as high, and sometimes more so, than the exculpatory value of rejections. In other data sets (e.g., Brewer & Wells, 2006), high-confidence filler identifications were more exculpatory than were lower levels of confidence, whereas in the Wetmore et al. (2015) data, it was moderate-confidence filler identifications that were most informative in the exculpatory direction (with low- and high-confidence filler identifications being equally informative in the exculpatory direction). However, this might be due to the fact that there were very few high-confidence filler identifications in the Wetmore et al. data, making the high-confidence filler-identification curves somewhat unstable. Wells et al. (2015) argued that high-confidence filler identifications should generally be more exculpatory than lower-confidence filler identifications because high confidence filler identifications indicate stronger confidence by the witness that the filler is a better match to the perpetrator than is the suspect.

The fact that filler identifications have exculpatory value is an important observation in light of evidence that law enforcement agencies often fail to make records of filler identifications. In their analyses of police files to score the outcomes of photo lineups in actual cases, researchers have found that lineup administrators failed to make records of filler identifications but always made records of suspect identifications (Behrman & Davey, 2011; Tollestrup, Turtle, & Yuille, 1994). Consistent with this, in a recent national survey, U.S. law enforcement agencies admitted that they do not even prepare a report of a lineup if the witness does not ID the suspect (Police Executive Research Forum, 2013). In a controlled experiment, Rodriguez and Berry (2014) assigned research participants to the role of lineup administrators who were either blind to which lineup member was the suspect or knew which lineup member was the suspect and which were fillers. When participant-administrators were blind, they made records of all of the witnesses' identifications (both suspect IDs and filler IDs). When the participant-administrators were not blind, however, they commonly failed to make records of filler IDs. Hence, this is yet another argument in favor of why eyewitness identifications should be conducted using double-blind procedures. In the absence of double-blind procedures, the results can be selectively reported.

Another important point is that the exculpatory value of filler identifications and rejections (pointing toward innocence) is generally less than the incriminating value

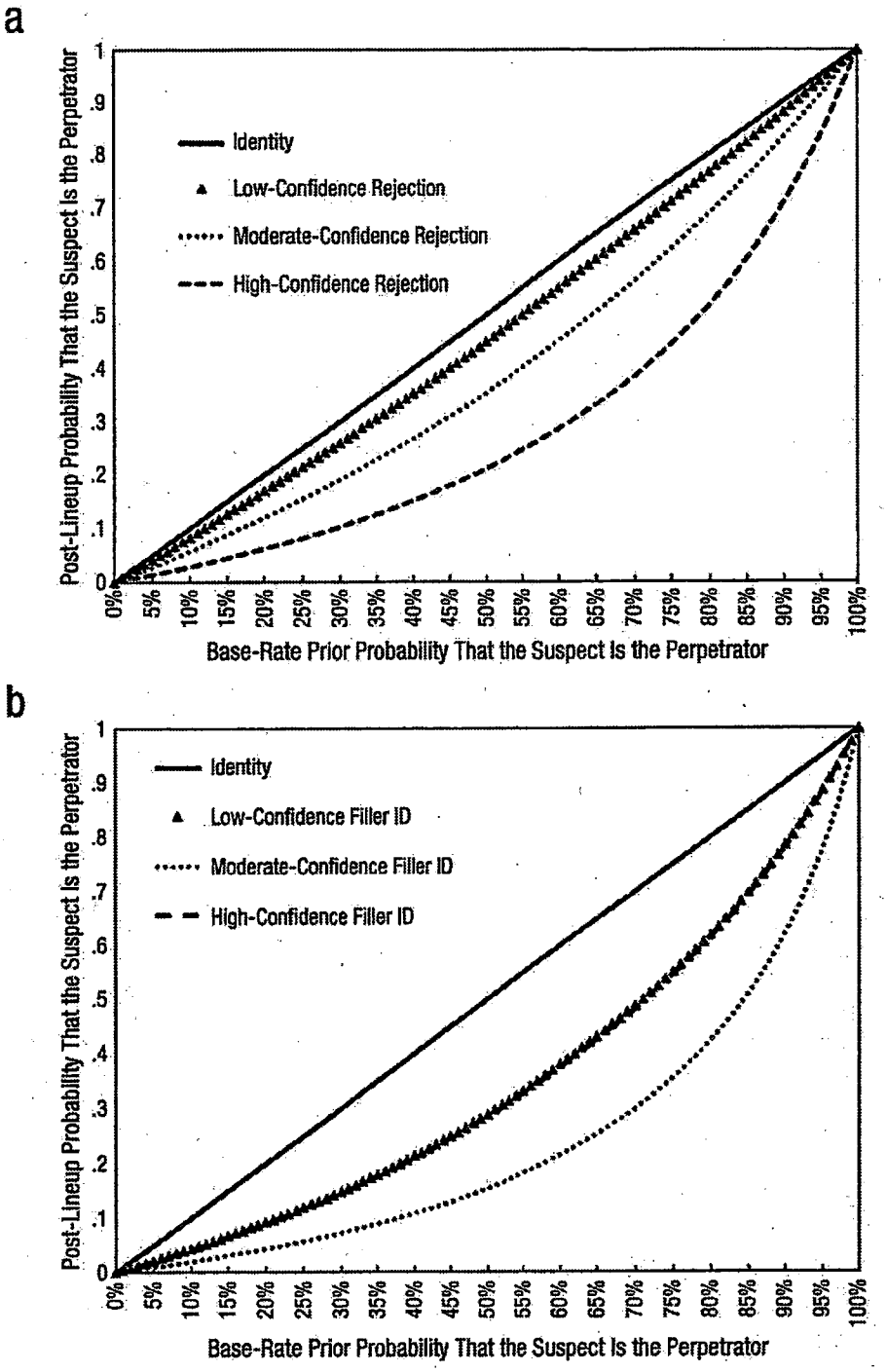


Fig. 10. Post-lineup probability that the suspect is the perpetrator as a function of the target-present base rate for lineups and the confidence of the witness who rejected the lineup (a) or identified a filler (b). The data are from Wetmore et al.'s (2015) fair lineups.

of identifications of the suspect (pointing toward guilt). This is apparent from noting that the area under the prior-by-posterior curves for identifications of the suspect (see Fig. 8) is greater than the area under the curve for rejections or identifications of fillers (Fig. 10). That type of pattern in the broader eyewitness-identification

literature led Wells et al. (2015) to conclude that lineups are more effective for incriminating suspects than they are for exculpating suspects.

Theoretical Considerations

What explains the fact that under appropriate testing conditions, eyewitness confidence is such a reliable indicator of accuracy, but under other testing conditions it is not? We begin by discussing why confidence and accuracy ought to be related in the first place. Then, we discuss the ways in which non-pristine testing conditions manage to confound this relation.

The signal-detection-theory account of a strong accuracy-confidence relation

In a fair lineup administered in double-blind fashion, it will usually be the case that the only face in the lineup that will generate a strong memory-match signal is the face of the perpetrator (i.e., the face that created the memory trace in the first place). Except in rare cases of chance resemblance between an innocent lineup member and the perpetrator, no other face in the lineup should generate a strong memory-match signal because these other faces were not the source of the witness's memory. This is true whether the operative memory signal is the absolute strength of the match between the memory of the perpetrator and a single face in the lineup (without regard for the other faces in the lineup) or is instead the relative strength of that match compared to the match generated by the other faces in the lineup. Either way, only a guilty perpetrator is likely to generate a strong memory signal.

Presumably, witnesses have learned through the course of daily life that a strong memory signal is an indicator of high recognition accuracy (and therefore warrants a high-confidence ID), whereas a weak memory signal is an indicator of low recognition accuracy (and therefore warrants either a low-confidence ID or a lineup rejection). Thus, under pristine testing conditions, simply relying on the strength of the absolute or relative memory signal ought to result in a strong confidence-accuracy relation (Mickes, Hwe, Wais, & Wixted, 2011). These ideas can be formalized in terms of a simple signal-detection model (Fig. 11), which has long been used to conceptualize the strong confidence-accuracy relationship observed in list-memory tasks used by basic memory researchers. The model in Figure 11 is usually applied to word-list memory tasks, but the basic concepts also apply to decisions made from a lineup. A version of the model applied to lineups would be somewhat more complicated, but its basic predictions about the confidence-accuracy relationship would remain unchanged. Thus, for the sake of simplicity, we use the standard (list memory) version of the model to illustrate what it predicts about the confidence-accuracy relationship.

In the context of eyewitness memory, signal-detection theory specifies how face-memory strength is distributed across guilty suspects (targets) and innocent suspects and fillers (lures) in a fair lineup. As depicted in Figure 11, the mean and standard deviation of the target distribution are both greater than the corresponding values for the lure distribution (a common but not necessary assumption). The model assumes that a decision criterion is placed somewhere on the memory-strength axis, such that a positive identification is made if the memory strength of a face (target or lure) exceeds it. Each level of confidence is associated with its own decision criterion. The overall correct-ID rate is represented by the proportion of the target distribution that falls to the right of the leftmost decision criterion, and the overall false-ID rate is represented by the proportion of the lure distribution that falls to the right of the leftmost decision criterion. Our concern here is not with the overall correct- and false-ID rates but is instead with the frequency of confidence-specific correct and false IDs. As illustrated in Figure 11, high-confidence IDs occur when a face generates a strong memory signal, one that exceeds the rightmost decision criterion. For the specific example shown in that figure, high-confidence IDs will often occur for target faces (37% of target-present trials result in a correct high-confidence ID) but will rarely occur for non-target faces (only 2% of target-absent trials result in an incorrect high-confidence ID). In other words, high-confidence IDs will be highly accurate. By contrast, weaker memory signals that surpass only the leftmost criterion for making an ID with low confidence are almost as likely to be incorrect as correct (13% of target-present trials result in a correct low-confidence ID; 9% of target-absent trials result in an incorrect low-confidence ID). Thus, low-confidence IDs will be inaccurate according to this account. Although this is just one specific example, it illustrates why it has long been understood that a strong confidence-accuracy relationship is an inherent feature of signal-detection theory.

How Non-Pristine Testing Conditions Harm the Confidence-Accuracy Relation

Although signal-detection theory's prediction of a good confidence-accuracy relation is well founded, it tends to be based on an assumption that the only source of information for confidence is the strength of the memory signal. And, in a typical memory experiment, signal strength is the only available informational cue on which to base one's confidence. But eyewitness confidence in an

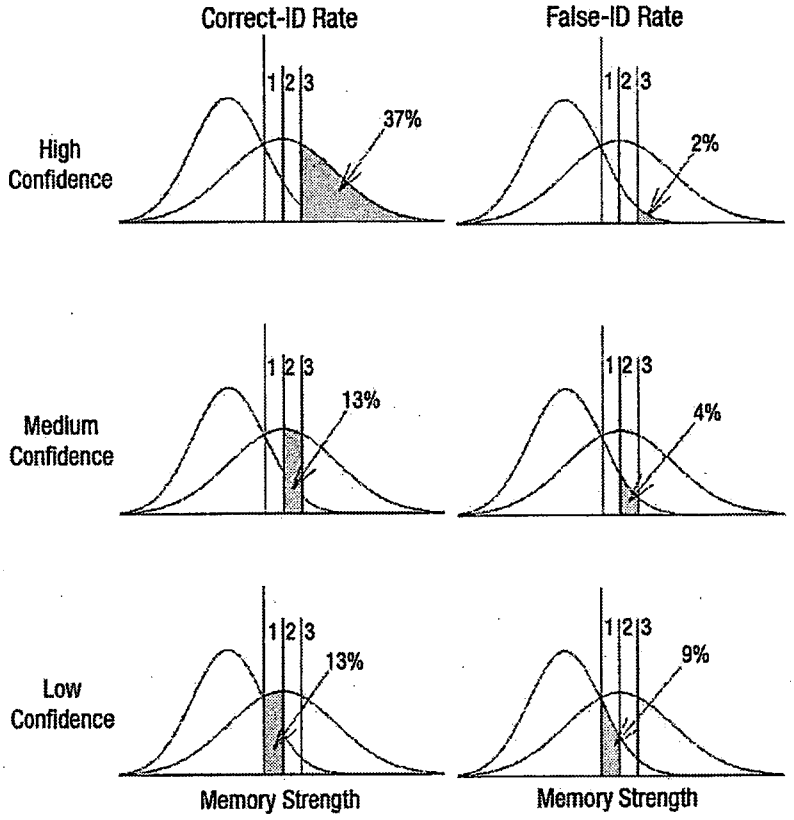


Fig. 11. Signal-detection-based interpretation of correct-ID rates (left panels) and false-ID rates (right panels) for high-confidence (top), medium-confidence (middle), and low-confidence (bottom) IDs. In each panel, the lure (innocent suspect) distribution is the narrow distribution on the left and the target (guilty suspect) distribution is the wider distribution on the right. Confidence criteria are shown as vertical lines, with the tallest vertical line representing the criterion for making an ID. The numbers 1, 2, and 3 represent low, medium, and high confidence, respectively.

identification is, in effect, the eyewitness's belief about the chances that the person he or she has identified is the perpetrator. And, as with other beliefs, eyewitnesses probably use whatever informational cues they have available to them when they state their confidence (Smalarz & Wells, 2015). If the only informational cue the eyewitness has at the time of making a confidence statement is a sense of the strength of the signal, then we would expect a good relation between accuracy and confidence because signal strength should be closely related to whether the target is the perpetrator or not. If, on the other hand, the eyewitness makes an identification and then overhears some seemingly confirmatory comment before making a confidence statement (e.g., "Your co-witness identified the same person"), then this confirmatory information is likely to be an additional cue driving his or her belief about the chances that the person identified is the perpetrator. In that case, the confidence of the witness is not based purely on the strength of the memory signal. If the confidence statement is based on considerations other than signal strength, then signal-detection theory's prediction of a confidence-accuracy relation no longer holds.

In our account, the requirement of pristine testing conditions applies not only to the composition of the lineup but also to the confidence statement, which should be assessed by the lineup administrator at the time of the initial identification (ideally, by a double-blind administrator whose behavior would not be influenced by knowledge of who the suspect is) before any other events can contaminate the confidence judgment. Consider, for example, the problem of assessing the confidence of an eyewitness who has been asked repeatedly to identify the same person (e.g., at the lineup, at a pretrial hearing, at trial). In such cases, the signal strength is likely to feel stronger to the eyewitness each time he or she encounters the person. Of course, the increase in signal strength is the result of repeated presentations of the suspect rather than the strength of the initial memory.

If, however, the witness fails to appreciate the effect of the intervening exposures on memory strength and relies on the (usually diagnostic) strong memory signal during subsequent tests, an error-prone high-confidence ID will be made. In the signal-detection model illustrated in Figure 11, this situation would be conceptualized as both distributions shifting to the right (as memory strength increases with repeated presentations) with the confidence criteria remaining fixed in place. In that case, high-confidence accuracy would plummet, because a much larger percentage of the lure distribution would now exceed the rightmost high-confidence criterion. Although a higher percentage of the target distribution would also now exceed the rightmost high-confidence criterion, the proportionate increase in false IDs would exceed the proportionate increase in correct IDs, so high-confidence accuracy would decrease. In effect, a source-monitoring failure will result in the witness relying on an internal memory cue—namely, strong memory—that is ordinarily diagnostic but no longer is (D. S. Lindsay, 2014; Roediger & DeSoto, 2015).

Why does a lineup that is composed of weak fillers (an unfair lineup) undermine our ability to infer high accuracy from high confidence? There are likely several reasons. First, one should not overlook the simple fact that unfair lineups increase the rate of mistaken identifications of innocent suspects at all levels of confidence. In a perfectly fair six-person lineup, for example, the maximum possible rate of mistaken identifications of an innocent suspect is 16.7%. And that maximum rate assumes that witnesses are performing at chance, that the perpetrator is never present in the lineup, and that all witnesses make an identification. But if just half of those witnesses do not make an identification and the perpetrator is in the lineup half of the time, the rate of mistaken identifications of innocent suspects from fair lineups would be less than 5% for low-confidence eyewitnesses and near floor for high-confidence eyewitnesses. An unfair lineup, in contrast, runs a much higher overall rate of mistaken identifications of the innocent suspect. This higher rate of mistaken suspect identifications from unfair lineups means that some are likely to end up in the high-confidence category.

In addition to raising the overall level of mistaken identifications of innocent suspects, there is also some evidence that unfair lineups can increase the confidence with which eyewitnesses make a mistaken identification. For example, as noted earlier, Charman et al. (2011) found that including highly dissimilar "dud" lineup members inflated witnesses' confidence in their mistaken identification of a non-dud. In a more recent study, Horry and Brewer (2016) manipulated the similarity between the suspect and the fillers in four-person simultaneous lineups and found that confidence judgments for positive identifications were predicted by the balance of evidence between the chosen item and the unchosen alternatives. In other words, as target-filler similarity decreased, confidence increased. This suggests that simultaneous lineup decisions are based at least in part on a relative memory-strength signal, which may be the reason why unfair lineups are so problematic. In an unfair lineup, the suspect (innocent or guilty) will generate a strong memory-match signal relative to those generated by the other lineup members (in Fig. 11, this would be conceptualized as both distributions being shifted to the right with the confidence criteria remaining fixed). The result would be a bias to choose that individual (Wells, 1984), even when making a high-confidence ID. As a bias to choose with high confidence increases, accuracy decreases. All of these problems are avoided (or at least minimized) if fair lineups are used.

An alternative but related theoretical interpretation is provided by fuzzy-trace theory's distinction between verbatim and gist memory traces (Brainerd & Reyna, 2005). According to fuzzy-trace theory, witnesses store both verbatim traces of the perpetrator plus more general (gist) traces of conceptually related information. Applied to eyewitness identification, the verbatim trace would be the perceptual representation of the perpetrator's face, whereas the gist trace might correspond to the general description of the perpetrator (e.g., an approximately 20-year-old White male with short dark hair and a scruffy beard). Depending on how retrieval is tested, a witness will rely on either the verbatim trace or the gist trace. When a participant relies on a verbatim trace, a strong memory-match signal (and attendant high confidence) will occur only when a face in the lineup matches that trace. As a general rule, such a match will occur only when the actual perpetrator is in the lineup. Thus, high-confidence accuracy will be high. The use of a pristine lineup seems well suited to promoting the retrieval of a verbatim trace because everyone in a fair lineup matches the gist (so the gist trace is of no help). However, in an unfair lineup, only the suspect corresponds to the gist trace, thereby promoting reliance on the gist trace instead of the verbatim trace. As noted by Brainerd and V. F. Reyna (2002):

> Retrieval of gist traces usually supports a more generic form of remembering, sometimes called familiarity, in which nonexperienced items are perceived to resemble experienced items but their occurrence is not explicitly recalled. However, when gist traces are especially strong, they can support high levels of phantom recollective experience for certain types of nonexperienced items—namely, items that are good cues for the gist of experience. (p. 166)

In other words, an unfair lineup might at times promote strong phantom recollection, leading to high-confidence errors. Accordingly, fuzzy-trace theory provides an additional theoretical rationale for recommending that the police use fair lineups.

General Conclusions

Our review of research concerned with the confidence-accuracy relationship in eyewitness identification is the first since Sporer et al. (1995) reviewed the literature more than 20 years ago. They found that when the analysis was limited to choosers, the correlation between confidence and accuracy was considerably higher than it was previously thought to be. That was their main message, even though their article is cited surprisingly often as suggesting the opposite. Nevertheless, the measure they used to assess that relationship—the point-biserial correlation coefficient—does not directly address the question of most interest to judges and juries. The point-biserial correlation coefficient is a perfectly reasonable effect-size statistic for a comparison between the average level of confidence associated with correct IDs versus the average level of confidence associated with incorrect IDs. However, the question asked by judges and juries concerns the average accuracy associated with suspect IDs made with a particular level of confidence. The correlation coefficient does not directly provide that information, but a calibration plot comes closer to doing so (Juslin et al., 1996). A calibration plot displays the proportion of correct IDs for choosers (or non-choosers) as a function of the level of confidence expressed, with confidence measured using a 100-point scale.

Calibration studies have consistently shown that for choosers, the confidence-accuracy relationship is strong (e.g., Brewer & Wells, 2006). The relationship is strong in the straightforward sense that high-confidence accuracy is much higher than low-confidence accuracy. Still, most calibration studies have found that highly confident witnesses are overconfident, and in one sense they are. Although CAC analysis treats only innocent-suspect IDs as relevant errors, from the eyewitness's point of view, filler IDs and innocent-suspect IDs are both relevant errors. Thus, when witnesses are asked to provide a confidence rating (e.g., 90%) that is commensurate with their accuracy (e.g., 90% of their IDs are guilty-suspect IDs, whereas 10% of their IDs are filler IDs or innocent-suspect IDs), their actual accuracy (e.g., 80% correct) can be said to reflect overconfidence. However, judges and juries in a case involving eyewitness-identification evidence are not interested in using an eyewitness's confidence to help them decide whether the witness picked a filler. Judges and juries already know that this particular witness did not pick a filler—the witness picked the suspect. Hence, judges and juries want to know how likely it is that the suspect is the perpetrator given that the witness identified the suspect with a particular level of confidence. The answer to their question, therefore, is provided by an analysis of the accuracy of suspect IDs per se without consideration of filler IDs. Of the suspect IDs that are made with a particular level of confidence, what proportion of those IDs were of guilty suspects and what proportion were instead of innocent suspects?

The answer to that key question is provided by CAC analysis, which is a measure of suspect-ID accuracy at each level of confidence for the base rate of target-present lineups used in the study (usually 50%). A more complete picture is provided by a Bayesian analysis that indicates what suspect-ID accuracy would be for the full range of possible base rates (0%–100%). Analyses of suspect-ID accuracy show that for a wide range of base rates, high confidence implies high accuracy (with no sign that witnesses are overconfident) and low confidence implies much lower accuracy. This is true of both lab studies and police department field studies, so long as pristine testing conditions are used. However, when the base rate is low enough (e.g., less than 25% of the lineups contain a guilty suspect), accuracy starts to become compromised across the board (even for high-confidence IDs). That fact provides a rationale for treating the base rate of guilty suspects as a system variable and for taking steps to ensure that the base rate is not unreasonably low. One way to do so is to require some objective evidence of guilt before placing a suspect in a lineup (Wells et al., 2015).

Importantly, a low-confidence ID on an initial test of memory from a lineup signals low accuracy whether or not pristine testing procedures are used. For this reason, low confidence should never be ignored and should instead always raise red flags about the reliability of the ID (Wixted et al., 2015). Although low-confidence IDs have some probative value when pristine procedures are used, under non-pristine testing conditions, they are even more error prone. As noted earlier, the majority of DNA exoneration cases in which eyewitness misidentification played a significant role were associated with, at best, a low-confidence ID on the initial memory test (Garrett, 2011). In some cases, the witness initially made a non-ID (i.e., confidence was so low that the witness identified no one) or a filler was identified. Thus, a low-confidence initial ID of a suspect from a lineup (or worse) corresponds to an uncomfortably high probability that the suspect is innocent. Had this simple fact been better understood by the legal system, many of the innocent defendants who were convicted based in part on a high-confidence ID that occurred in court may never have been convicted in the first place.

The news about the unreliability of a low-confidence initial ID will come as no surprise to most readers. Presumably, most readers are already under the impression that eyewitness memory is inherently unreliable, such that a suspect ID is error prone even under the best of conditions and even when confidence is high. Thus, the main news we have to offer is that eyewitness memory is not inherently unreliable. Under pristine testing conditions, a high-confidence suspect ID appears to be highly probative of guilt. Ignoring that fact—as the legal system is increasingly inclined to do—only serves to inappropriately exonerate the guilty. At the same time, ignoring low confidence at the time of an initial ID inappropriately imperils the innocent. The take-home message is that initial eyewitness confidence obtained from a pristine eyewitness-identification procedure serves both of the fundamental goals of the criminal justice system: to clear the innocent and to convict the guilty. By contrast, any later expression of confidence (including the confidence expressed by the eyewitness at trial in front of a jury) should be ignored, because doing otherwise works against the cause of justice.

Filler IDs and non-IDs are probative of innocence

Just as suspect-ID accuracy provides the information of interest to judges and juries tasked with evaluating the reliability of an eyewitness who has identified a suspect, analyses performed separately on filler IDs provide the information of interest to judges and juries tasked with evaluating the implications of the fact that an eyewitness picked a filler from a lineup instead of a suspect. Such an eyewitness would not testify against the defendant (because the eyewitness did not identify the defendant), but the fact that a filler ID occurred at an earlier stage of investigation nevertheless provides relevant information. The fact that a filler ID was made is somewhat probative of innocence. In other words, when filler IDs are examined separately, the data suggest that, given that a filler ID occurred, it is somewhat more likely that the lineup contained an innocent suspect than a guilty suspect.

In other cases, the eyewitness may have made a non-ID at the outset of the investigation. In a case like that, judges and jurors would be interested in the information value of a non-ID, and that information is provided by separately performed analyses of lab data for eyewitnesses who made non-IDs from target-present and target-absent lineups. When such an analysis is performed, the data indicate that non-IDs are also probative of innocence. The key point is that whether a case involves a suspect ID (the kind of ID that has helped to send innocent people to prison), a filler ID, or a non-ID, the information value of the ID in question is provided by analyzing the data separately, not by combining the data across suspect IDs, filler IDs, and non-IDs or by combining the data for choosers (suspect IDs and filler IDs) and analyzing them separately from data for non-choosers (non-IDs).

One of the relevant situations in which good records of rejections and filler IDs is important is in multiple-witness cases. Suppose, for example, that one witness identified the suspect and the other two rejected the lineup. What does that mean? Clark and Wells (2008) analyzed a large number of lab studies to estimate the probability that the suspect was the perpetrator under various combinations of suspect-ID, filler-ID, and lineup-rejection decisions in multiple-witness cases. In most cases, if one witness identified the suspect and the other two either rejected the lineup or picked a filler, the overall evidence pointed toward innocence rather than guilt of the suspect. Going forward, it will be important to address questions like this, taking into account IDs made with various levels of confidence (e.g., one high-confidence suspect ID and two low-confidence filler IDs).

Clark and Wells's (2008) analysis of the multiple-witness situation made it clear that one cannot ignore the witnesses who failed to pick the suspect. Nevertheless, in a 2012 national survey of U.S. law enforcement agencies, 37% of the agencies reported that they do not even write a report making a record of a lineup if the witness did not identify the suspect in the case (Police Executive Research Forum, 2013). Following on the lineups-as-experiments analogy described earlier in this article, this is akin to an experimenter ignoring data that are inconsistent with the hypothesis. Wells et al. (2015) argued that a failure to make a clear record of non-IDs and filler IDs could be construed as a "Brady violation"—that is, the violation of a constitutional requirement that the state reveal to the defense any evidence that might favor the defense (*Brady v. Maryland*, 1983).

Non-pristine testing conditions

How informative is confidence in a suspect ID that was made under non-pristine testing conditions? This is an important question to consider because, in the real world, pristine testing conditions will not always be achieved. Scientific research has clearly established that certain non-pristine testing conditions severely compromise the information value of eyewitness confidence. We consider them here.

Initial versus later confidence. Expressions of confidence by the eyewitness beyond the confidence statement at the initial identification are potentially problematic because a variety of factors (e.g., post-ID feedback) can inflate confidence without increasing accuracy. Thus, only an initial confidence statement—one that is made

before there is much opportunity for confidence contamination to occur—provides reliable information. That fact underscores the importance of a recommendation long made by eyewitness-identification researchers and recently reiterated by the National Academy of Sciences committee: The initial confidence statement made by an eyewitness should be recorded and preserved. In this regard, another recommendation by the National Academy of Sciences committee—to videotape the witness-identification process—takes on special importance. Juries typically see an eyewitness make a high-confidence ID only in the courtroom, and they are heavily influenced by it. This is unfortunate because only the first ID, which occurred back at the beginning of the police investigation, provides diagnostic information about the reliability of the ID. With regard to its influence on jury decision making, an abstract discussion of the fact that confidence was low during an initial ID may have a hard time competing with the live expression of high confidence that occurs in the courtroom. However, if the initial lineup procedure were video recorded, jurors would have direct evidence that the eyewitnesses' initial level of confidence was low—evidence that would likely help them to understand that the ID is unreliable no matter what the witness now says.

Until relatively recently, video recording of all identification procedures was not practical for some jurisdictions because of the financial costs and video storage difficulties involved. Today, however, that is no longer true. Nevertheless, there are likely to be some cases in which witness cooperation is an issue. For example, if a witness who is critical to a case fears being video recorded (e.g., out of concern that the recording will end up on the Internet, where gang members will see who identified their comrade), then proceeding with the identification procedure without video recording it (perhaps instead audio taping it) might be advisable. Still, where possible (presumably in the large majority of cases), video recording the session will go a long way toward ensuring the integrity of the identification procedure and providing the jury with the information it needs about eyewitness confidence.

Having reliable information about the confidence of the eyewitness at the initial identification allows the defense to learn about and explain to the jury that confidence inflation has occurred. Some lab-based evidence has shown that, as one would hope, upon learning that a witness who was highly confident at trial was actually not confident at the time of the initial identification, mock jurors discounted their ratings of witness accuracy and the defendant's probability of guilt (Bradfield & McQuiston, 2004). On the other hand, Jones, Williams, and Brewer (2008) found that an "explanation" from the witness (e.g., "I was nervous at the time but now I am confident") led mock jurors to discount the low initial confidence of the witness and be more influenced by his or her later confidence. Indeed, we have concerns about how these problems would play out in pre-court and court proceedings to the extent that witnesses who were initially not confident would find some reason to explain away their initial lack of confidence and lead the court to rely on the inflated confidence that they had developed. One solution might be to adopt a hard-and-fast judicial rule stating that only the initial confidence of an eyewitness, made in good faith, is permissible in court. Another solution might be to adopt jury instructions stating that only confidence in an initial, good-faith attempt at an identification provides valid information about its reliability.

Fair versus unfair lineups. Another non-pristine testing condition that clearly compromises the information value of eyewitness confidence is an unfair lineup. Study after study has shown that if the innocent suspect in the lineup resembles the perpetrator to a greater extent than the fillers do (e.g., if the innocent suspect matches the description of the perpetrator more than the fillers do), high-confidence suspect-ID accuracy is greatly reduced (as illustrated earlier in Fig. 6). The importance of this observation is hard to overstate. If an unfair lineup is used, then the take-home message in this article does not apply. Mistakenly assuming that a high-confidence initial ID is highly accurate even when an unfair lineup is used is a recipe for wrongfully convicting the innocent.

Blind versus non-blind lineups. The blind lineup-administration procedure logically eliminates a potential source of error because the lineup administrator cannot possibly—intentionally or otherwise—steer the witness to the suspect in the lineup or provide post-ID praise to the witness for "getting it right" (thereby inflating even the initial statement of confidence). After an identification, even statements from a lineup administrator such as "you have been a really great witness" inflate the confidence of witnesses who have made a mistaken identification, but such statements do not inflate confidence if the witness knows that the lineup administrator is blind as to which lineup member is the suspect and which are fillers (Dysart, Lawson, & Rainey, 2012). In addition, there is evidence that lineup administrators influence witness confidence even when the administrators are given an unbiased script that they are supposed to follow (Garrioch & Brimacombe, 2001). Furthermore, lab data have shown that when people are assigned to the role of a lineup administrator, they tend to not make records of filler IDs when they know which lineup member is the suspect (non-blind lineup administrators), but they

faithfully make such records when they do not know the status of the identified lineup member (blind lineup administrators; see Rodriguez & Berry, 2014). These considerations explain why blind lineup administration has long been recommended by eyewitness-identification researchers and why that recommendation was also recently endorsed by the National Academy of Sciences committee.

The point is that (a) confidence is a reliable indicator of accuracy under pristine testing conditions; (b) confidence is a much less reliable indicator of accuracy under certain non-pristine testing conditions (e.g., when an unfair lineup is used or when the test is not the initial ID test); and (c) eyewitness expressions of confidence can be influenced by non-blind lineup administrators, which is an undesirable outcome no matter what its effect on accuracy might be. Obviously, confidence may or may not be a reliable indicator of accuracy under other conditions that have not yet been subjected to scientific investigation. Later, we recommend some research priorities for further investigating the eyewitness confidence-accuracy relationship.

Estimator variables and confidence in a suspect ID

In the studies reviewed here, eyewitnesses who were tested using pristine procedures appropriately adjusted their confidence downward when they were aware that no one in the lineup strongly matched their memory of the perpetrator. This is just another way of saying that there is a strong relationship between confidence and accuracy. That finding may have some non-obvious but nevertheless important implications for how people generally think about the effect of various estimator variables on eyewitness-identification accuracy. Consider, for example, how juror guidelines in Massachusetts instruct juries to think about estimator variables. Those instructions list a variety of factors than can make memory worse, on average (e.g., long retention interval, short exposure time, stress, the presence of a weapon), and they invite jurors to believe that if one or more of those factors is present, then the reliability of the ID should be regarded as less trustworthy than it otherwise would be. As intuitively appealing as this line of thinking might be, the evidence suggests that it may not be valid.

To illustrate this point, we consider the fact that a long retention interval typically results in worse overall memory performance compared to a short retention interval. Does that fact imply that a high-confidence initial ID of a suspect made after a long retention interval is less trustworthy than a high-confidence initial ID of a suspect made after a short retention interval? Not necessarily. Eyewitnesses have a sense of how well each lineup member matches their memory, and if the memory is weak, they are not likely to have high confidence. That is, as memory fades with the passage of time, eyewitnesses will be less likely to experience a strong memory-match signal when viewing the members of a photo lineup. As a result, witnesses might make more errors but, critically, those errors are likely to be associated with low confidence (because high-confidence IDs are typically made when the memory-match signal is strong, not when it is weak, as it generally would be following a long retention interval). Nevertheless, for the smaller percentage of eyewitnesses who do make a high-confidence ID despite a long retention interval, their average accuracy could be every bit as high as that for the larger percentage of eyewitnesses who make a high-confidence ID following a short retention interval.

Although additional research is certainly needed, the available evidence indicates that eyewitnesses may often appropriately adjust confidence to the prevailing memory conditions, contrary to Deffenbacher's optimality hypothesis (Deffenbacher, 1980). Palmer, Brewer, Weber, and Nagesh (2013, Experiment 1) compared immediate versus 1-week-delayed performance in a large-scale experimentally controlled field study. Not surprisingly, they reported that overall accuracy was lower following the 1-week retention interval than on the immediate test, but as shown in Figure 4l, the accuracy of high-confidence IDs was equally high either way. The same was true when overall memory strength was manipulated by varying exposure duration from 5 seconds to 90 seconds (also shown in Fig. 4l) or by varying whether or not attention was distracted during exposure (Fig. 4m). In each case, overall memory performance was weaker in one condition compared to the other, but high-confidence accuracy was the same either way. With regard to a retention-interval manipulation, Juslin et al. (1996), Read et al. (1998), and Sauer, Brewer, Zweck, and Weber (2010) all reported a similar outcome (Figs. 4h, 4n, and 4p, respectively). Note that the Read et al. (1998) results are noteworthy in that those authors used retention intervals as long as 9 months.

Similar effects are evident for several other estimator variables. For example, Carlson and Carlson (2014) and Carlson, Dias, Weatherford, and Carlson (in press) found that although the presence of a weapon clearly led to worse memory performance overall (the weapon-focus effect), it had virtually no effect on the accuracy of identifications made with high confidence (Figs. 4c and 4d). The same outcome was observed by Dodson and Dobolyi (2016) for same-race versus cross-race IDs (Fig. 4f). Cross-race IDs were associated with significantly lower recognition memory performance compared to same-race IDs, but high-confidence IDs were highly (and similarly) accurate either way.

If these results generalize to the real world, they suggest that these estimator variables may not be particularly relevant to the reliability of an initial ID made with high confidence. Although definitive conclusions cannot yet be drawn, the overall pattern of results suggests that under pristine testing conditions, estimator variables that have long been thought to compromise the reliability of a suspect ID may not do so (because eyewitnesses appropriately adjust their confidence under poorer estimator-variable conditions). Still, it would be premature to make a definitive statement regarding the effect of different estimator variables on the accuracy of IDs made with high confidence because the issue has only recently been addressed using CAC analysis. In addition, a study by Lampinen, Erickson, Moore, and Hittson (2014) investigated the effect of distance on identification accuracy. This study used an old/new recognition procedure (not a lineup) in which each witness made 16 recognition decisions. Thus, its design was far removed from the kind of forensically relevant lineup designs that we have considered here. Nevertheless, it is worth noting that according to our estimates based on the ROC data presented in their Figure 4, high-confidence accuracy was always below 90% and became noticeably worse as distance increased, falling to approximately 70% correct at the longest distances tested. Whether the same would be true for lineups is unknown, but this result underscores the fact that more work is needed to determine the effect of estimator variables on high-confidence accuracy.

Mistaken-ID rates at the level of the lineup versus the courtroom: The plea effect

At this point it is important to note that we cannot necessarily assume that the chances that a high-confidence ID is mistaken at the level of the lineup are the same as the chances that a high-confidence ID is mistaken at the level of a trial. One reason, although not the only reason, is that guilty pleas (which do not go to trial) will remove many more guilty than innocent people from trials. This *plea effect*, originally described by Wells, Memon, and Penrod (2006), yields a distribution of innocent and guilty individuals at trial that is different from the distribution at the level of the lineup.

Let us assume that witnesses who were tested using pristine procedures (fair lineup, double-blind administrator, confidence measured at time of ID, etc.) and were 95% to 100% confident have a 98% chance of being accurate. In other words, only 2% of these witnesses would be mistaken. Suppose now that we have a defendant on trial who was identified by an eyewitness who made the identification under pristine testing conditions and was 95% to 100% confident. Can we assume, in the absence of any other evidence, that at the trial level there is only about a 2% chance that the person the witness identified is an innocent person? The answer is "not necessarily," especially in the U.S. legal system. Depending on its size, the plea effect could create a situation in which the chance that the defendant is innocent is much higher than 2%.

The plea effect (Charman & Wells, 2007; Wells et al., 2006) refers to the fact that most criminal convictions never involve a trial at all but instead are obtained through guilty pleas. In fact, over 95% of criminal convictions in the United States are attained through plea deals and are never brought to trial (Ross, 2006). Because fewer than 5% of felony convictions come from people who claim innocence and choose to take their case to trial, those who do so represent a small subset of defendants. And, although innocent people sometimes plead guilty (e.g., over 20% of the DNA exoneration cases involved an innocent person who pled guilty), it seems reasonable to assume that the chances that an innocent person would take a case to trial rather than plead guilty is much greater than the chances that a guilty person would take a case to trial.

Consider 10,000 suspect IDs made with high confidence. For the sake of simplicity, let's assume that all 2% of those who were mistakenly identified with high confidence ($10{,}000 \times 0.02 = 200$ innocent suspects) are prosecuted and take their case to trial (after all, they are innocent). And, let's assume that of the 98% who were accurately identified with high confidence ($10{,}000 \times 0.98 = 9{,}800$ guilty suspects), 97% ($9{,}800 \times 0.97 = 9{,}506$) take a plea and 3% ($9{,}800 \times 0.03 = 294$) instead go to trial. If this were the case, and if jury trials always resulted in guilty verdicts, then $100\% \times 9{,}506 / (9{,}506 + 200) = 95.1\%$ of guilty verdicts would arise through plea deals. Moreover, among those who took their case to trial (200 innocent suspects and 294 guilty suspects), the chances of the defendant being guilty based on the eyewitness-identification evidence alone would be slightly less than $100\% \times 294 / (294 + 200) \approx 60\%$. In other words, what is a mere 2% mistaken-identification rate at the level of the lineup becomes a 40% chance of innocence among cases that make it to trial. That reduction in accuracy at trial is, of course, offset by an increased level of accuracy associated with high-confidence IDs that ended in a plea deal instead of going to trial. In this example, because all of the innocent suspects went to trial, 100% of the defendants who were identified with high confidence and who accepted a plea bargain would be guilty.

Obviously, these numbers will change depending on the assumptions that are made. For example, instead of being equally likely to be forwarded for prosecution (as assumed in the example above), guilty suspects may be

more likely than innocent suspects to be forwarded for prosecution. This might occur because guilty suspects are more likely to have independent corroborating evidence against them compared to innocent suspects. In addition, the 95% plea rate, which is based on all cases, may be an overestimate for eyewitness-identification cases because defense attorneys might believe that they have a better chance of acquittal in cases involving eyewitness-identification evidence than in many other types of cases. If we assume that suspects who have been identified with high confidence are twice as likely to be forwarded for prosecution if they are guilty than if they are innocent (because of a disparity in corroborating evidence), that 25% of guilty suspects choose jury trials (in hopes of discrediting eyewitness evidence), and that 50% of jury trials end in guilty verdicts, then 85% of all guilty verdicts in cases involving eyewitness identification would arise from plea bargains, and high-confidence ID accuracy at trial would be 96% correct.

Although the precise numbers cannot be known, it is important to appreciate that the plea effect changes the ratio of the innocent to the guilty among those who actually go to trial. The more the plea effect increases the ratio of the innocent to the guilty at trial, the less trustworthy a high-confidence ID becomes at trial (and the more trustworthy a high-confidence ID becomes for those who choose to accept a plea bargain).

The distinction between eyewitness-identification accuracy at the level of the lineup and eyewitness-identification accuracy at the level of cases that go to trial is important. An eyewitness expert giving trial testimony, for example, should be careful to not equate the mistaken-identification rate at the level of the lineup with the chances that the defendant is guilty in a particular case that made it to trial. A similar caution applies to the base-rate issue discussed previously (i.e., a high-confidence accuracy score estimated from a study that used a 50% target-present base rate does not directly apply to a jurisdiction that might have a much lower base rate). At the same time, these considerations do not undermine the general conclusion of the current article, namely that high-confidence eyewitness identifications made using pristine testing procedures have a very low rate of error.

Priorities for future research

How to collect a confidence statement from an eyewitness. Although confidence in an initial ID is highly predictive of accuracy, no police department field study has specifically investigated different methods for recording initial confidence. Should a confidence statement be taken in the witness's own words (as in Klobuchar et al., 2006), or should confidence be recorded using an explicit 3-point rating scale (as in Wixted et al., 2016)—or should a 100-point scale be used? Given the clear information value of initial confidence, this issue seems important to pursue.

How to create a fair lineup. Unfair lineups seriously degrade the information value of eyewitness confidence. One way to minimize the chances of creating an unfair lineup is to ensure that every member of the lineup matches the description of the perpetrator provided by the witness. However, this is a subjective process, and even an investigator who is trying to follow that directive might unintentionally create an unfair lineup. Indeed, in one condition of a recent police department field study (the blinded condition in Wixted et al., 2016), the lineups assessed by mock witnesses were found to be unfair in that the suspect in the lineup was selected, on average, more than the fillers based solely on the description. But even when care is exercised to make sure that all fillers match the description of the perpetrator that was provided by the witness, the lineup might not be fair. This is because eyewitnesses' verbal descriptions of perpetrators are often vague or incomplete, and sometimes the description does not even match the suspect (Luus & Wells, 1991). Some have proposed that the fillers should be matched to the suspect on major physical characteristics rather than just those contained in the eyewitness's description of the perpetrator (e.g., Lindsay, Martin, & Webber, 1994). Others have proposed that the fillers be selected based on their overall similarity to the suspect (Clark & Tunnicliff, 2001). Some have found that it is possible to make the fillers too similar to the suspect (which protects innocent suspects but reduces the chances of identifying perps; see Wells et al., 1993). And, as discussed earlier in this article, when someone becomes a suspect based on similarity to a composite or a surveillance image, simply matching fillers to the eyewitness's verbal description of the suspect is not sufficient. Clearly, the general idea that poor lineup fillers place innocent suspects at risk and confound our ability to rely on confidence is not in question, and we see evidence of this in the CACs shown in Figure 6. But there is a need to articulate more precisely what the criteria should be for making lineups fair. What tools can be developed for officers who are tasked with creating a lineup to make their job easier and more objective?

The effect of estimator variables on confidence. An important goal for future research will be to determine if the conclusions discussed above with respect to estimator variables apply to other estimator variables that are relevant to eyewitness IDs in the real world (e.g., high stress vs. low stress). The fact that estimator variables have an effect on overall memory accuracy is beyond

dispute; what remains unknown is what effect they have on the confidence-accuracy relationship when the data are subjected to CAC analysis. This is an important issue to specifically investigate because variables that impair overall memory accuracy do not necessarily have any effect on the accuracy of suspect IDs made with high confidence (instead, they may affect only the frequency of high-confidence suspect IDs).

Exploring other ways of sorting between guilty and innocent suspects. The standard approach to assessing eyewitness-identification confidence is to ask the eyewitness how confident she or he is in the identification that was made. But research by Sauer, Brewer, and Weber (2008) found that collecting a witness confidence statement for each lineup member (rather than only the one who was chosen) provided a more informative indicator of recognition. Following on this finding, more recent research has shown promising results for procedures in which eyewitnesses do not pick someone out of a lineup at all but instead make a confidence judgment about whether each lineup member is the perpetrator (e.g., Brewer, Weber, Wootton, & Lindsay, 2012; Sauer, Brewer, & Weber, 2008; Sauer, Brewer, & Weber, 2012) or rate how well each face matches their memory of the perpetrator (Sauer, Weber, & Brewer, 2012). Results from profile analyses and classification algorithms have shown that such methods may be superior to the traditional eyewitness-identification task. Other work has examined decision time and shown that eyewitnesses make accurate identifications consistently faster than they make mistaken identifications (e.g., Dunning & Perretta, 2002; Sauer, Brewer, & Wells, 2008; Sporer, 1993). Our point here is simply that we do not want to close off the possibility that there might be other approaches to assessing the probability of a suspect's guilt that work even better than traditional methods.

Conclusion

According to the available data, the relationship between confidence and accuracy for an initial ID from an appropriately administered lineup is sufficiently impressive that it calls into question the very notion that eyewitness memory is generally unreliable. Eyewitness memory can certainly *become* unreliable as a result of influences introduced by the legal system (feedback, repeated exposure to the suspect, misinformation, biased lineup composition, etc.), but the same is true of any kind of evidence, including DNA evidence. A contaminated eyewitness memory test, like a contaminated DNA test, is not reliable. However, the available research suggests that when pristine testing procedures are used, an initial ID made with high confidence is highly indicative of accuracy. Perhaps even more importantly, an initial ID made with low confidence—whether testing conditions are pristine or not—is highly error prone. A better appreciation of that simple fact might have prevented most of the DNA exonerees from being convicted in the first place. Thus, instead of disregarding eyewitness confidence altogether, the legal system should draw a distinction between initial confidence that was obtained using pristine testing procedures and confidence obtained later or under conditions known to compromise the confidence-accuracy relationship.

Appendix A

An illustration of a strong confidence-accuracy relationship despite a low point-biserial correlation

Twenty years ago, Juslin, Olsson, and Winman (1996) explained that the point-biserial correlation coefficient is problematic for assessing the confidence-accuracy relationship because its value can be low even when eyewitnesses exhibit perfect calibration (such that 100% confidence implies 100% accuracy, 90% confidence implies 90% accuracy, etc.). However, they did not illustrate what the point-biserial correlation coefficient actually measures, nor did they reanalyze any of the prior data to show what those data look like when analyzed in a more appropriate way. This may account for why, to this day, scientists continue to rely on the point-biserial correlation coefficient to measure the relationship between confidence and accuracy and why the legal system does so as well. Here, we explain what this statistic actually measures and why it should no longer be used if the goal is to inform the legal system about the reliability of a suspect ID made with a particular level of confidence. Again, it is a perfectly valid statistic when used for other purposes (Rosnow, Rosenthal, & Rubin, 2000), and it does signal a strong relationship between confidence and accuracy when its value is high (D. S. Lindsay, Nilsen, & Read, 2000; D. S. Lindsay, Read, & Sharma, 1998). However, for the purpose of predicting eyewitness-identification accuracy from an eyewitness's expression of confidence, it can be misleading because it does not necessarily indicate a weak relationship between confidence and accuracy when its value is low (as has been assumed by researchers and the legal system alike).

Table A1 presents hypothetical data generated by 30 "choosers" who have made an ID from a lineup and rated confidence using a 5-point confidence scale (1 = *low confidence*, 5 = *high confidence*). Choosers make one of four possible decisions: correctly identifying a suspect from a target-present lineup, incorrectly identifying a suspect from a target-absent lineup, incorrectly identifying a filler from a target-present lineup, or incorrectly identifying a filler from a target-absent lineup. Thus, all of the

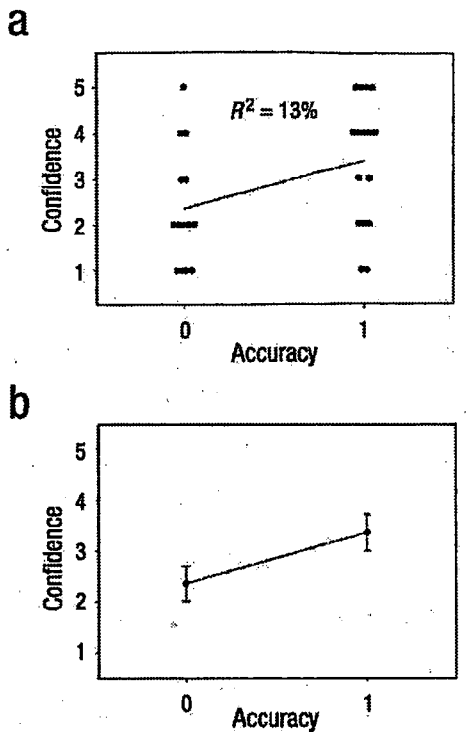


Fig. A1. Hypothetical data generated by 30 "choosers" who have made an ID from a lineup and rated confidence using a 5-point scale, with confidence plotted as a function of accuracy. In panel (a), each point is a data point from one participant, and the line is the line of best fit. In panel (b), the points represent the data averaged across confidence, and the bars represent standard errors.

accuracy scores of "1" in Table A1 correspond to suspect IDs from target-present lineups (which is the only correct response for a chooser). For simplicity, these hypothetical data are conceptualized as having come from a mock-crime study in which it is known whether the suspect in the lineup is innocent or guilty (e.g., as illustrated in Fig. 1). The data in Table A1 have been chosen to illustrate a point about the correlation between confidence and accuracy, not to reflect what typical data necessarily look like. The correlation between the 30 accuracy scores and the 30 corresponding confidence scores shown in the two rightmost columns of Table A1 is .36, which is slightly lower than the generally accepted value of .41 for choosers.

Figure A1a illustrates the fact that computing a point-biserial correlation coefficient is tantamount to fitting a straight line through the data when confidence is plotted as a function of accuracy coded in binary format (0 = inaccurate, 1 = accurate). Each point represents one participant, and the points for different participants that would fall atop one another have been slightly spread out on the accuracy dimension to show how many participants are associated with each confidence-accuracy pair. The best-fitting line is the one that minimizes the sum of the squared deviations (vertically) between the line and the 30 individual data points. It is difficult to imagine how judges and juries could extract useful information about the likely reliability of a particular suspect ID (e.g., one made with high confidence) from data analyzed in this manner.

Figure A1b shows the same data except that the confidence ratings have been averaged together to make a more interpretable graph. This figure clearly shows that the average level of confidence is higher for correct IDs than for incorrect IDs. In fact, this is how the data were plotted in Figure 1 of Sporer, Penrod, Read, and Cutler's (1995) seminal article. When the data are analyzed in this manner, the result is presumably more interpretable to judges and juries. However, a problem with Figure A1b is that it plots the unaveraged dependent measure (accuracy coded as 0 or 1) on the x-axis and the averaged predictor variable (confidence) on the y-axis. This would be the appropriate way to plot the data if you knew, for each eyewitness, whether his or her ID was correct or incorrect and wanted to estimate his or her likely level of confidence. If that were the question of interest, then the point-biserial correlation coefficient would be a reasonable effect-size statistic to help conceptualize the results of a t test (for example) comparing average confidence for correct decisions versus average confidence for incorrect decisions (Rosnow et al., 2000). Yet this is not the question of interest, because in actual practice, the situation is reversed: An eyewitness provides a confidence rating associated with an ID (this is the predictor variable, which is not averaged), and the legal system wants to make the best estimate as to the likely accuracy of that ID (this is the dependent variable, and it equals the average level of accuracy associated with each level of confidence that an eyewitness might express). This logic suggests, as Juslin, Olsson, and Winman (1996) pointed out, that plotting average accuracy (on the y-axis, as the dependent measure) versus different levels of confidence (on the x-axis, as the independent measure) is the sensible way of representing the data and addressing the question of interest. Only when plotted this way are the data presented in a manner that provides an answer to the critical question asked by the criminal justice system: Given that an eyewitness has a particular level of confidence in his or her ID, how accurate is that ID likely to be?

Figure A2a shows the same data plotted in Figure 2a except that the axes have been reversed to plot the independent variable (confidence) on the x-axis and the dependent variable (accuracy) on the y-axis. Obviously, because the information in Figures A1a and A2a is the same, the best-fitting line corresponds to the same point-biserial correlation coefficient (.36) as in Figure A1a. However, even with the variables appropriately reversed, the data do not yet provide much in the way of useful

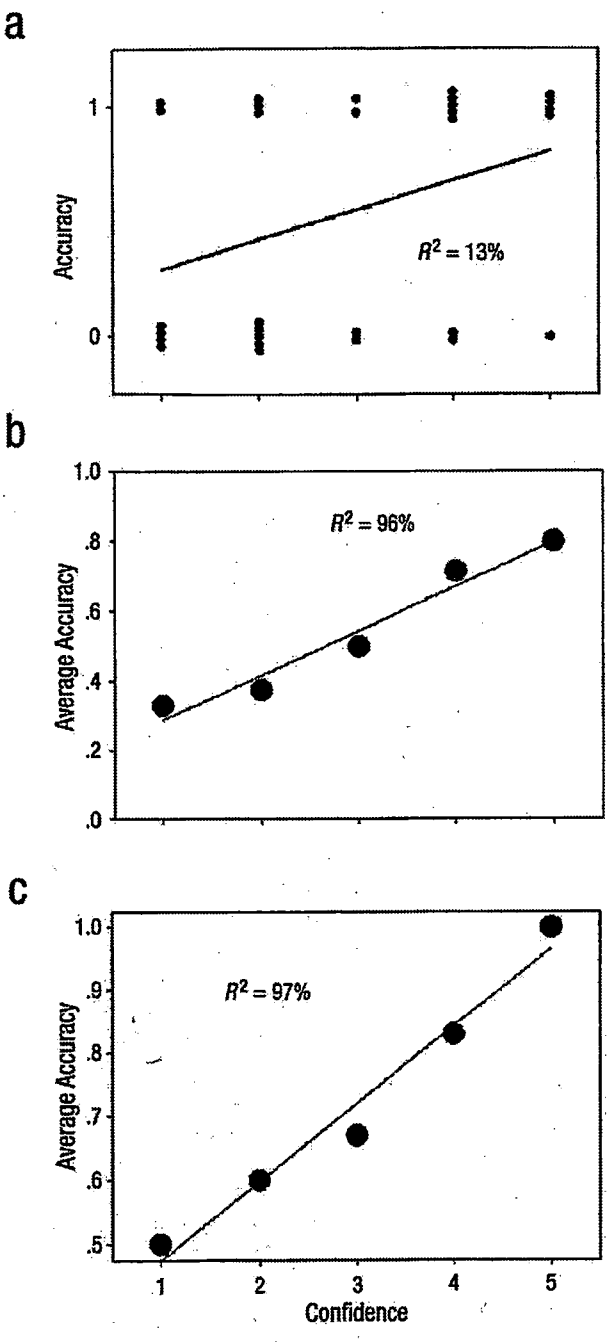


Fig. A2. Hypothetical data generated by 30 "choosers" who have made an ID from a lineup and rated confidence using a 5-point scale, with accuracy plotted as a function of confidence. In panel (a), each point is a data point from one participant, and the line is the line of best fit. In panel (b), the points represent the data averaged across accuracy. Panel (c) shows the confidence-accuracy characteristic curve for when only suspect IDs are included in the accuracy calculation.

information to courts of law. Figure A2b shows the same data as Figure A2a except that the binary accuracy scores associated with each level of confidence have been averaged together. Now the data are depicted in a way that is useful to judges and juries. How accurate is an ID made with the highest level of confidence (a rating of 5) likely to be? How accurate are medium-confidence IDs (e.g., ratings of 3)? And how accurate are low-confidence IDs (e.g., ratings of 1)? The answers to these questions are meaningful to judges and jurors (Mickes, 2015), and all of this information is available in Figure A2b. By contrast, the point-biserial correlation coefficient (obtained by fitting the data in Figures A1a and A2a with a straight line) does not provide this information.

For these hypothetical data, which yield a point-biserial correlation of .36, IDs made with high confidence (a rating of 5) are 80% correct, whereas IDs made with low confidence (a rating of 1) are only 33% correct. Thus, a point-biserial correlation that is even less than the magnitude of the widely accepted estimate for choosers (i.e., .41) is consistent with high-confidence IDs being far more accurate than low-confidence IDs. But even this improved analysis underestimates the reliability of eyewitness identification for the same reason that the calibration curves do. What is the problem?

Of the 30 hypothetical choosers shown in Table A1, 22 picked a suspect and the other eight picked a filler (as indicated in Column 2). Imagine that in none of these 22 cases is there any incriminating evidence against the suspect other than the evidence that might be provided by the eyewitness. In this example, eight eyewitnesses chose a filler, thereby ending any further consideration of the suspects in those lineups. But 22 of them identified a suspect, and those 22 identifications are the ones that would go forward as direct evidence of the suspect's guilt. Some of these identifications involve a suspect ID made with high confidence and others involve a suspect ID made with low confidence. The judges and juries in those cases would be interested in knowing whether or not such IDs are reliable. Stated differently, their question is as follows: Of the eyewitness-identification cases that end up before judges and juries (which are limited to identified suspects), what does confidence tell us about the reliability of the ID? Note that this is a question about the 22 cases that go forward to the prosecution using eyewitness identification as direct evidence of the suspect's guilt, not about the full set of 30 cases involving choosers. The answer to this question is provided by limiting the analysis not just to choosers but to *choosers who identify a suspect*—just as the legal system limits its consideration to choosers who identify a suspect.

Table A2 presents the hypothetical data from the 22 choosers who identified a suspect (i.e., it presents the data that would be of interest to judges and jurors), and it now highlights the six choosers in this example who incorrectly identified an innocent suspect from a target-absent lineup. Although none of those six choosers identified an innocent suspect with high confidence (i.e., with

Table A1. Hypothetical Confidence-Accuracy Data From 30 Participant-Witnesses

Witness	Pick type	Lineup type	Accuracy	Confidence
1	Suspect	TP	1	4
2	Suspect	TP	1	4
3	Suspect	TA	0	1
4	Suspect	TP	1	1
5	Suspect	TA	0	2
6	Suspect	TP	1	4
7	Filler	TA	0	5
8	Suspect	TP	1	3
9	Filler	TA	0	2
10	Filler	TP	0	2
11	Suspect	TP	1	5
12	Suspect	TP	1	4
13	Filler	TA	0	1
14	Suspect	TP	1	4
15	Filler	TP	0	1
16	Filler	TA	0	2
17	Suspect	TP	1	2
18	Suspect	TP	1	5
19	Filler	TA	0	4
20	Suspect	TP	1	2
21	Suspect	TP	1	3
22	Suspect	TA	0	3
23	Suspect	TP	1	5
24	Suspect	TP	1	1
25	Suspect	TA	0	1
26	Suspect	TA	0	4
27	Suspect	TP	1	5
28	Suspect	TP	1	2
29	Filler	TA	0	3
30	Suspect	TA	0	2

Table A2. Hypothetical Confidence-Accuracy Data From the 22 Choosers From Table A1

Witness	Pick type	Lineup type	Accuracy	Confidence
1	Suspect	TP	1	4
2	Suspect	TP	1	4
3	Suspect	TA	0	1
4	Suspect	TP	1	1
5	Suspect	TA	0	2
6	Suspect	TP	1	4
8	Suspect	TP	1	3
11	Suspect	TP	1	5
12	Suspect	TP	1	4
14	Suspect	TP	1	4
17	Suspect	TP	1	2
18	Suspect	TP	1	5
20	Suspect	TP	1	2
21	Suspect	TP	1	3
22	Suspect	TA	0	3
23	Suspect	TP	1	5
24	Suspect	TP	1	1
25	Suspect	TA	0	1
26	Suspect	TA	0	4
27	Suspect	TP	1	5
28	Suspect	TP	1	2
30	Suspect	TA	0	2

Note: Confidence ratings range from 1 (*low confidence*) to 5 (*high confidence*). Accuracy is coded as 0 for inaccurate and 1 for accurate. TP = target present; TA = target-absent.

a rating of 5), four of the other 16 witnesses did identify a guilty suspect with high confidence (Witnesses 11, 18, 23, and 27). Thus, high-confidence suspect-ID accuracy in this hypothetical example is perfect (4 correct, 0 incorrect).

Figure A2c shows the results of this analysis when the data are limited to the 22 choosers in Table A1 who identified a suspect. Obviously, the relationship between confidence and accuracy for these hypothetical data is still very strong, in the sense that high-confidence IDs are far more accurate than low-confidence IDs (as illustrated in Fig. 3b). High-confidence suspect IDs are 100% accurate, whereas low-confidence suspect IDs are only 50% accurate (close to chance). Thus, not only is confidence highly diagnostic of accuracy, high-confidence suspect IDs in this hypothetical example are extremely accurate (as accurate as they could possibly be). Keep in mind that these are the very same data that when analyzed using the point-biserial correlation coefficient and including choosers who identify fillers (as in Fig. A1a) yield a value of .36. Even when the point-biserial correlation coefficient is computed for choosers who made suspect IDs (i.e., even when computed using the data in Table A2), its value is only .39. Thus, the correlation coefficient does not convey the information of interest to judges and juries. The data shown in Figure A2c do.

Figure A2c shows a confidence-accuracy characteristic curve (Mickes, 2015). Such a curve plots suspect-ID accuracy as a function of confidence that has been assessed using any numerical scale (in this example, a 1-to-5 scale). Suspect-ID accuracy is computed separately for each level of confidence, c, and is computed from the number of suspect IDs from target-present (*TP*) lineups, $nSID_{TP\text{-}c}$, and the number of suspect IDs from

target-absent (*TA*) lineups, $nSID_{TA\text{-}c}$. More specifically, suspect ID accuracy for a given level of confidence is equal to $nSID_{TP\text{-}c} / (nSID_{TP\text{-}c} + nSID_{TA\text{-}c})$. In the example above, for high-confidence IDs (i.e., $c = 5$), $nSID_{TP\text{-}5} = 4$ and $nSID_{TA\text{-}5} = 0$, so high-confidence suspect-ID accuracy is 4 / (4 + 0) = 1.0. This accuracy score differs from the usual dependent measure in calibration studies, in which filler IDs are included in the denominator (as in Fig. A2b). Obviously, including filler IDs lowers the estimated accuracy score, although in this case it has little effect on the overall correlation between confidence and accuracy. However, the correlation is not relevant for what judges and juries want to know, because the correlation could be perfect and yet high-confidence IDs could still (hypothetically) be only 60% accurate. Hence our concentration on the confidence-accuracy characteristic and the probability correct associated with high- and low-confidence suspect IDs.

Appendix B

Estimating suspect-ID accuracy from a calibration score

Most of the calibration studies we reviewed did not present their data in sufficient detail to directly calculate suspect-ID accuracy, so we computed an estimate from the calibration data reported in figures. WebPlotDigitizer (http://arohatgi.info/WebPlotDigitizer/) was first used to estimate C_c (proportion correct, C, for each level of confidence, c). We then converted those scores, which included filler IDs, to scores that included only suspect IDs. The conversion from C_c to suspect-ID accuracy, $p(TP|SID_c)$, is straightforward. Using the most common calibration formula (which excludes filler IDs from target-present lineups), calibration for a given level of confidence is:

$$C_c = \frac{nSID_{TP-c}}{nSID_{TP-c} + nFID_{TA-c}} \quad (1)$$

To convert C_c to suspect-ID accuracy, we use the following formula:

$$p(TP \mid SID_c) = \frac{c_c}{c_c + (1 - c_c)/n} \quad (2)$$

where n = lineup size. As an example, imagine a study using eight-person lineups in which there were 80 correct high-confidence suspect IDs from target-present lineups and 80 high-confidence incorrect IDs from fair target-absent lineups that did not have a designated innocent suspect. Thus, $nSID_{TP\text{-}high} = 80$ and $nFID_{TA\text{-}high} = 80$. In that case, calibration for high-confidence IDs (Equation 1) would equal 80 / (80 + 80) = .50. However, to compute suspect-ID accuracy, the number of high-confidence filler IDs from target-absent lineups, $nFID_{TA\text{-}high}$, is divided by lineup size to estimate the number of innocent-suspect IDs from target-absent lineups, $nSID_{TA\text{-}high}$, where $nSID_{TA\text{-}high} = nFID_{TA\text{-}high} / n$. Note that suspect-ID accuracy is given by:

$$\frac{nSID_{TP-c}}{nSID_{TP-c} + nSID_{TA-c}}$$

Thus, for this example, suspect-ID accuracy (the proportion of suspect IDs that were correct) is 80 / (80 + 80 / 8), which reduces to 1 / (1 + 1 / 8) = .89. However, all we have is the reported calibration accuracy score of .50 (estimated from a figure). Using the above formula (Equation 2), the calibration score is converted into a suspect-ID accuracy score by computing .50 / [.50 + (1 − .50) / 8)], which reduces to 1 / (1 + 1 / 8) = .89. Thus, Equation 2 gives us the right answer (i.e., the same answer we came up with by directly computing suspect-ID accuracy from the raw counts of suspect IDs and filler IDs—the kind of information we do not have access to in most studies). Equation 2 was used to compute suspect-ID accuracy from the calibration scores for each level of confidence—scores that were estimated from the reported figures. All of the studies involved a base rate of approximately 50% (i.e., 50% of the lineups were target-present lineups, and 50% were target-absent lineups).

Appendix C

A short primer on base rates in lineups

The probability that some proposition is true (e.g., that a suspect is guilty) given the result of an evidentiary test (e.g., identification by a witness in a lineup test) is a function of both the diagnostic value of the evidence (e.g., the reliability of the identification) and the base-rate (or prior) probability that the proposition is true. This is often counterintuitive, and people commonly assume that the probability that a proposition is true is equal to the diagnostic value of the evidence without regard to the base rate. Consider, for example, a prostate exam that gives a positive result 98% of the time when there is cancer (a 98% hit rate) and a positive result only 2% of the time when there is no cancer (a 2% false-positive rate). Armed with such information, most people will assume that a positive result indicates a 98% chance of cancer. But that would be true only if one were sampling from a population of men for whom the base rate of prostate cancer was 50% to begin with. Suppose, however, the test is conducted on relatively young men for whom the base rate for prostate cancer is a mere 1%. In the 1%-base-rate

population, a positive test result would yield a probability of cancer of slightly less than 5%, not 98%.

The influence of base rates is somewhat counterintuitive, but the math is not particularly difficult. Consider, for example, that in the 1%-base-rate population of young males, 999 of every 1,000 males tested would not have cancer. However, because there is a 2% false-positive rate for the test, 20 of these young males would have a false-positive result (2% of 999 = 19.98). The one male with cancer among the 1,000 young males would almost certainly yield a positive result as well. So, 21 of the young males would have a positive test result, but only one of the 21 would actually have cancer. Hence, the probability that any one of these young males who had a positive result actually has cancer would be only about 1 in 21, or 4.8%.

This same base-rate issue applies to police lineup tests. Specifically, the probability that a suspect is guilty given that the witness identified that suspect is a function of both the diagnostic value of the evidence and the base-rate probability that a lineup's suspect is guilty. Imagine one extreme jurisdiction (the "Bumbling Detectives PD") in which none of the lineups that police conduct include the guilty suspect (i.e., the target-present base rate is 0%). With a 0% base rate, even a miniscule false-positive rate yields only mistaken identifications and no accurate identifications. Now imagine the other extreme (the "Perfect Detectives PD"), a jurisdiction in which the suspect in a lineup is always the perpetrator (i.e., the target-present base rate is 100%). With a 100% base rate, even a high false-positive rate would yield no false positives on suspect identifications: Every ID of a suspect would be accurate.

When the base rate is 0%, the accuracy rate for identifications of the suspect is 0%, and when the base rate is 100%, the accuracy rate for identifications of suspect is 100%. Of course, real base rates for target-present lineups in police departments will lie somewhere between these two extremes. And, as one moves from the 0% base rate to the 100% base rate, the probability that the identified suspect is the perpetrator follows a Bayesian curve (not a straight line)—a prior-by-posterior probability curve.

Consider the prior-by-posterior curves that we created for the Wetmore et al. (2015) data as displayed in Figure 8. We used Bayes's theorem to calculate each point in these curves. Here, we show how three specific points on the moderate-confidence curve were calculated—one at the 30% base rate, one at the 50% base rate, and one at the 80% base rate.

The vertical axis in Figure 8 is the probability that the suspect is the perpetrator given that the witness identified the suspect from the lineup, which is what we are trying to estimate. We use the expression $p(SP \mid IDS)$ to represent the probability that the suspect is the perpetrator (SP) given an identification of the suspect (IDS). We use the expression $p(IDS \mid SP)$ to represent the probability of identification of the suspect (IDS) given that the suspect is the perpetrator (SP). In effect, $p(IDS \mid SP)$ is the hit rate. Likewise, $p(IDS \mid SNP)$ is the probability of identification of the suspect (IDS) given that the suspect is *not* the perpetrator (SNP). In effect, $p(IDS \mid SNP)$ is the false-alarm rate. The term $p(SP)$ is the target-present base rate (or prior probability that the suspect is the perpetrator). The term $p(SNP)$ is, in effect, the target-absent base rate, which is $1 - p(SP)$. We can then put the data into a version of Bayes's theorem as shown below.

$$p(SP \mid IDS) = \frac{p(IDS \mid SP) \times p(SP)}{\left(p(IDS \mid SP)\,p(SP)\right) + \left(p(IDS \mid SNP)\,p(SNP)\right)}$$

In the Wetmore et al. (2015) data, $p(IDS \mid SP)$ (i.e., the hit rate) for moderate-confidence witnesses was 72.3%, and $p(IDS \mid SNP)$ (i.e., the mistaken-identification rate) was 10.6%. These two values do not change as a function of the base rate. In effect, these two values constitute the diagnosticity of IDs by the moderate-confidence witnesses. Using the Bayesian expression in Equation 1, the probability that the suspect is the perpetrator given that the witness identified the suspect for the 50% base rate is:

$$p(SP \mid IDS) = \frac{.723 \times .50}{(.723 \times .50) + (.106 \times .50)} = .872$$

Suppose, however, that the base rate was 80%. The probability that the suspect is the perpetrator given that the witness identified the suspect for the 50% base rate is:

$$p(SP \mid IDS) = \frac{.723 \times .80}{(.723 \times .80) + (.106 \times .20)} = .965$$

And, if the base rate was 30%, the probability that the suspect is the perpetrator given that the witness identified the suspect is:

$$p(SP \mid IDS) = \frac{.723 \times .30}{(.723 \times .30) + (.106 \times .70)} = .745$$

Each of these three points on the moderate-confidence curve can be observed in Figure 8.

The degree to which base-rate changes (e.g., from 30% to 80%) moderate the probability that an identified suspect is guilty depends on the diagnosticity of the witness. As diagnosticity increases, the effect of the base rate diminishes. For example, for moderate-confidence witnesses in the Wetmore et al. data, moving from a 30% base rate to an 80% base rate changed the probability that the suspect was the perpetrator from 74.5% to 96.5%, a change of over

20 percentage points. But for high-confidence witnesses, moving from the 30% base rate to the 80% base rate changed the probability that the suspect was the perpetrator from 87.7% to 98.5%, a change of less than 11 percentage points. And for low-confidence witnesses, moving from the 30% base rate to the 80% base rate changed the probability that the suspect was the perpetrator from 62.8% to 94.0%, a change of over 30 percentage points.

Another observation about base rates of note here is that the confidence of the witness makes more difference to our ability to trust the identification when the base rate is in the lower ranges than when the base rate is in the upper ranges. Using the Wetmore et al. (2015) data, for example, when the base rate is 35%, the probability that an identified suspect is guilty for low-confidence witnesses is 22% lower than it is for high-confidence witnesses. When the base rate is 90%, however, the probability that an identified suspect is guilty for low-confidence witnesses is only 2% lower than it is for high-confidence witnesses. This means that when jurisdictions have lineups with relatively low target-present base rates, the importance of eyewitness confidence is even greater than when their lineups' base rates are higher.

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The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Notes

1. Note that in these studies and in most of the ones we consider later, there are more IDs made with high than low confidence, so suspect-ID accuracy scores for low-confidence IDs tend to be more variable than for high-confidence IDs.
2. Only 5% of witnesses made IDs at the highest level (a rating of 7) of confidence, which makes the sample size unstable for isolating this one level of confidence. Hence, we combined confidence levels 6 and 7.

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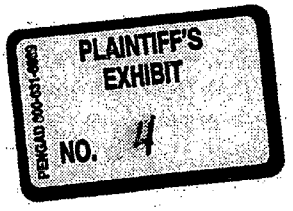
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ORIGINAL ARTICLE

Suggestive Eyewitness Identification Procedures and the Supreme Court's Reliability Test in Light of Eyewitness Science: 30 Years Later

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Abstract The U.S. Supreme Court's ruling concerning suggestive eyewitness identification procedures (*Manson v. Braithwaite*, 1977, 432 U.S. 98) has not been revisited by the Court in the intervening 30+ years. Meanwhile, scientific studies of eyewitnesses have progressed and DNA exonerations show that mistaken identification is the primary cause of convictions of the innocent. We analyzed the two-inquiry logic in *Manson* in light of eyewitness science. Several problems are discussed. Ironically, we note that suggestive identification procedures (determined in the first inquiry) boost the eyewitnesses' standing on three of the five criteria (used in the second inquiry) that are used to decide whether the suggestive procedures were a problem. The net effect undermines safeguards intended by the Court and destroys incentives to avoid suggestive procedures.

Keywords Eyewitness · Lineups · Suggestive identification procedures · Expert eyewitness testimony

Every day in the United States courts entertain arguments in pre-trial hearings that challenge eyewitness identification evidence based on suggestive eyewitness identification procedures. The arguments are familiar and the suggestive aspects common. They include using a show-up procedure (the suspect alone presented to the witness) when police could have conducted a lineup (embedding the suspect among fillers), conducting a lineup in which the suspect stood out, failing to tell the eyewitness that the culprit might not be in the lineup, showing the witness a photo of the suspect before conducting a lineup, telling a potentially non-confident eyewitness that his or her choice was correct, or conducting a second lineup procedure in which the only person in common was the suspect. The defense argument for suppressing the identification in light of even the most highly suggestive procedures almost never prevails (Loftus and Doyle 1997). Instead, courts end up ruling that the suggestiveness of the procedure is outweighed by the "reliability test" articulated by the U.S. Supreme Court in *Manson v. Braithwaite* (1977). *Manson v. Braithwaite* is, in effect, the law of the land on eyewitness identification. Although some state courts have tweaked the reliability test in *Manson*, the core idea remains largely as it was laid out in 1977.

Interestingly, it was around the time of *Manson* that psychological scientists began to conduct programmatic experiments on eyewitness identification with a strong emphasis on suggestive identification procedures (Wells 1978). Since that time, hundreds of eyewitness experiments have been published in peer-reviewed journals, many of which bear on issues in *Manson*. Overall, the empirical data indicate that eyewitness identification evidence is not performing very well (Penrod 2005). In addition, since the time of *Manson*, forensic DNA testing was developed and has been used to test claims of innocence. More than 200 exonerations based on post-conviction DNA testing reveal that mistaken identification was involved in more of these DNA exonerations (over 75%) than all other causes combined (see Connors et al. 1996; Scheck et al. 2000; Wells et al. 1998; see innocenceproject.org/for an up-to-date count of these cases). All the DNA exoneration cases had the benefit of *Manson* when they were tried,[1] which is at

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[1] Or the benefit of the nearly identical ruling, *Neil v. Biggers* (1972), on which *Manson* was based.

least some indication that *Manson* did not work to prevent their wrongful convictions.

The known DNA exoneration cases can only be a fraction of the innocent people who have been convicted based on mistaken eyewitness identification evidence. There are several reasons why the true numbers would have to be dramatically higher than 200. First, in a large percentage of the old cases (in which convicted persons claim to have been misidentified) the biological evidence for DNA testing has deteriorated, has been lost, or has been destroyed. Moreover, virtually all DNA exoneration cases involved sexual assault because those are the cases for which definitive biological evidence (contained in semen) is available to trump the mistaken identification. Such biological evidence is almost never available for murders, robberies, drive-by shootings, and other common crimes that have relied on eyewitness identification evidence. A recent study of lineups in Illinois indicates that only 5% of lineups conducted in Chicago, Evanston, and Joliet were sexual assault cases (Mecklenburg 2006). Most lineup identifications were for non-sexual assaults, robberies, and murders for which there is almost no chance that DNA would be available to trump a mistaken identification. In addition, we would normally expect sexual assault victims to be among the most reliable of eyewitnesses because sexual assault victims usually have a longer and closer look at the culprit than other crime witnesses (compared to robberies, for instance). For these reasons, the DNA exoneration cases can only represent a fraction, probably a very small fraction, of the people who have been convicted based on mistaken eyewitness identification.

All things considered, we doubt that the Court had the same appreciation for the magnitude of the mistaken identification problem in 1977 (pre-DNA testing) that we have today. Moreover, we certainly know that the eyewitness science that exists today was not available to the Court in 1977. Hence, with an enhanced appreciation of the dominant role of mistaken identification in convictions of the innocent, we take a new look at *Manson* in light of the eyewitness science that has emerged. First, we review the *Manson* ruling, including both the majority and minority opinions. Then, we review the science on suggestive identification procedures followed by the science on the five *Manson* criteria. Next, we relate the science back to the two-inquiry logic of *Manson* to reveal a flaw in the two-inquiry approach. We then describe how this flaw serves to dismiss concerns about suggestive procedures, destroys incentives for ridding the system of suggestive eyewitness identification practices, and creates an illusion of protection against wrongful convictions based on eyewitness identification testimony. Finally, we discuss various alternatives to the *Manson* approach.

Manson v Braithwaite

Prior to 1972, there was a presumption, based in large part on the U.S. Supreme Court's ruling in *Stovall v. Denno* (1967), that unnecessarily suggestive eyewitness identification procedures should be excluded as evidence at trial. This became known as the per se exclusion rule. But the per se approach was effectively discarded in 1972 when the Court ruled in *Neil v. Biggers* (1972) and reaffirmed its ruling vigorously in 1977 in *Manson v. Braithwaite* (1977) based on what is sometimes called the *reliability* approach or the *totality* approach. In effect, the Court argued that the issue of exclusion should not rest with whether there was unnecessary suggestiveness per se but should be based instead on the question of whether the identification was nevertheless reliable. Hence, the Court created a two-pronged test for exclusion. The first prong or inquiry is whether the procedure was unnecessarily suggestive. If it was not, then there is no issue. If it was unnecessarily suggestive, then a second inquiry must be held to decide whether the identification was nevertheless reliable. The Court spelled out five criteria for deciding whether the identification was reliable despite the suggestive procedure, which we will call the *Manson criteria* because, although they were first articulated in *Neil v Biggers*, it was *Manson v Braithwaite* that reaffirmed and clarified the Court's two-pronged reliability approach. If the witness has good standing on the reliability criteria, then the identification should not be excluded even if the procedure was unnecessarily suggestive.

Manson v. Braithwaite was argued November 29, 1976 and the U.S. Supreme Court issued its decision on June 16, 1977. Braithwaite had been convicted of the possession and sale of heroin based solely on identification evidence by undercover agent Jimmy Glover. The agent-witness did not know the person he bought the heroin from but based on a description and the location of the apartment, a fellow officer, D'Onofio, produced a single photo of Braithwaite. Using this single photo, Agent Glover reportedly made a positive identification of Braithwaite's photo as being a photo of the man from whom he bought the heroin.[2] Both

[2] The current article uses the word "reportedly" as a qualifier to the "positive identification" claim that has been used repeatedly in previous writings about Glover's identification of Braithwaite's photo. In fact, no one but Glover was present when Glover first viewed the photo and the only record comes from later testimony from Glover himself. Glover's later claim that the identification was positive and immediate must be treated with some caution given what we know today about retrospective memory distortions of the certainty and immediacy of identification decisions when later information appears to confirm the identification (e.g., Wells and Bradfield 1998). Braithwaite was later arrested in the apartment where Glover made the purchase, which might itself have constituted a form of confirming feedback.

the Second Circuit and the Supreme Court concluded that the identification procedure was impermissibly suggestive, but then continued to the second inquiry (following *Neil v. Biggers* 1972) as to whether, under all the circumstances, that suggestive procedure gave rise to a substantial likelihood of irreparable mistaken identification.

This second inquiry is the reliability test, borrowed directly from *Neil v Biggers*. Having found that the identification procedure was unnecessarily suggestive, the Court asked whether the identification was reliable even though the procedure was suggestive. Five criteria were articulated for the reliability test concerning (1) view, (2) attention, (3) description, (4) passage of time, and (5) certainty. The majority of the Court concluded that there was no substantial likelihood of irreparable mistaken identification and cited the witness' standing on the five factors outlined in *Biggers*:

1. *Opportunity to view*: Witness Glover was within two feet of the seller and the confrontation was at least "a couple of minutes." There was natural light from the window or skylight.
2. *Attention*: Glover was paying attention because, as a trained police officer, he realized he would have to find and arrest the dealer.
3. *Description*: He gave a detailed enough description that it enabled D'Onofrio to pick a single photo that was later shown to witness Glover.
4. *Time to identification*: Only 2 days passed between the crime and the photo identification.
5. *Certainty*: Glover had "no doubt" that Braithwaite was the person who had sold him heroin.

Based on their analysis, the majority on the Court concluded that there was not a very substantial likelihood of irreparable misidentification. An even longer opinion, however, was written in dissent. In the dissenting opinion, written by Justice Marshall and joined by Justice Brennan, a different characterization emerged of the witness' standing on the five factors outlined in *Biggers*.[3] With regard to *opportunity to view*, Marshall wrote:

> Careful review of the record shows that he could see the heroin seller only for the time it took to speak three sentences of four or five short words, to hand over some money and later after the door reopened, to receive the drugs in return. The entire face-to-face transaction could have taken as little as 5 or 10 seconds (p. 130).

With regard to *attention*, Marshall wrote:

> "But during this time, Glover's attention was not focused exclusively on the seller's face. He observed that the door was opened 12 to 18 inches, that there was a window in the room behind the door, and, most importantly, that there was a woman standing behind the man. Glover was, of course, also concentrating on the details of the transaction – he must have looked away from the seller's face to hand him the money and receive the drugs The observation during the conversation thus may have been as brief as 5 or 10 seconds (p.131)." Marshall further notes that "the mere fact that he has been so trained [as a police officer] is no guarantee that he is correct in a specific case. His identification testimony should be scrutinized just as carefully as that of the normal witness (p. 131).

Regarding the 2-day time from confrontation to identification, Marshall wrote:

> While such temporal proximity makes the identification more reliable than one occurring months later, the fact is that the greatest memory loss occurs within hours after an event. After that, the drop-off continues much more slowly. Thus, the reliability of an identification is increased only if it was made within several hours of the crime (p. 132).

Regarding the *description* given by Glover, Marshall wrote:

> ...the description given by Glover was actually no more than a general summary of the seller's appearance. We may discount entirely the seller's clothing, for that was of no significance later in the proceeding. Indeed, to the extent that Glover noticed clothes, his attention was diverted from the seller's face. Otherwise, Glover merely described vaguely the seller's height, skin color, hairstyle, and build. He did say that the seller had "high cheekbones," but there is no other mention of facial features, nor even an estimate of age. Conspicuously absent is any indication that the seller was a native of the West Indies, certainly something which a member of the black community [which Glover was] could immediately recognize (p. 133). "Marshall further notes that D'Onofrio, who did not witness the transaction, had acted on a "wild guess" based on Glover's vague description and that D'Onofrio thought that the drugs had been purchased at a different apartment than the one Glover made the transaction.

Finally, regarding Glover's *apparent certainty*, Marshall wrote:

[3] Although originally spelled out in *Neil v. Biggers* (1972), this article will refer to the five criteria used in the second inquiry (view, attention, certainty, time, description) as the *Manson* criteria, or the *Manson* factors, or the *Manson* reliability test.

> ...the witness' degree of certainty in making the identification – is worthless as an indicator that he is correct. Even if Glover had been unsure initially about his identification of respondent's picture, by the time he was called at trial to present a key piece of evidence for the State that paid his salary, it is impossible to imagine his responding negatively to such questions as "is there any doubt in your mind whatsoever" that the identification was correct (p. 131).

It is not a primary purpose of this article to contrast the majority opinion's assessment of the witness' standing on the *Manson* criteria with that of the minority. And it certainly is not the purpose of this article to debate whether Braithwaite was factually innocent or guilty. But, the sharply differing views between the two assessments are striking and it highlights some of the problems that we see with the *Manson* criteria. Notice, for example, that the majority opinion tends to take the witness' self-reports at face value, whereas Marshall does not. For instance, the majority opinion states that the time to view was at least a couple of minutes because that is what Glover said in his testimony. Marshall, in contrast, uses reasoning to estimate that the *functional exposure time* to the seller's face might have been as little as 5 or 10 s. Similarly, the majority opinion states that the witness had "no doubt" in his identification, whereas Marshall suggests that the witness might have been unsure in his initial identification and grew to be certain as a function of later psychological processes. Notice as well that the majority was impressed with the description because it did not significantly differ from Braithwaite's appearance and was good enough to lead D'Onofrio to the photo that he showed to witness Glover. Marshall, on the other hand, noted conspicuous absences in the description and dismissed D'Onofrio's pulling of Braithwaite's photo as a wild guess. Notice as well that the majority thought that 2 days was a short period of time between the confrontation and the identification and compared it to months, whereas Marshall thought it was a long time and compared it to hours.

Back to the First Inquiry

The different assessments of the majority versus minority opinions in the *Manson* case helps make clear that reasonable people can disagree about whether the witness' standing on the *Manson* criteria are strong or weak. But this is even further complicated by the fact that any assessment of the second inquiry (the reliability inquiry based on application of the *Manson* criteria) would necessarily require a full appreciation of the power of the suggestive influences found in the first inquiry. Indeed, some of the differences between the majority view and the minority view of the witness' standing on the *Manson* criteria in Braithwaite might be attributable to differences in the presumed power of the suggestive procedure itself. Recall that courts are supposed to decide whether the identification procedure was impermissibly suggestive first. If it is, then the second inquiry begins (i.e., the assessment of the witness' standing on the *Manson* criteria). Although the majority opinion in Braithwaite was that the procedure was impermissibly suggestive, the majority was also somewhat dismissive of the power of the one-photo procedure:

> we find in the instant case little pressure on the witness to acquiesce in the suggestion that such a display entails. D'Onofrio had left the photograph at Glover's office and was not present when Glover first viewed it two days after the event. There thus was little urgency and Glover could view the photograph at his leisure. And since Glover examined the photograph alone, there was no coercive pressure to make an identification arising from the presence of another. The identification was made in circumstances allowing care and reflection (p. 117).

Hence, the majority, in some respects, appeared close to thinking that the procedure was not highly suggestive in the sense that it did not seem to account for the witness' positive decision. Marshall, in contrast, wrote:

> With good reason, such single-suspect procedures have "been widely condemned." *Stovall v. Denno, 388 U.S., at 302.* They give no assurance that the witness can identify the criminal from among a number of persons of similar appearance, surely the strongest evidence that there was no misidentification. In *Simmons* v. *United States,* our first decision involving photographic identification, we recognized the danger that a witness seeing a suggestively displayed picture will "retain in his memory the image of the photograph rather than of the person actually seen. Subsequent identification of the accused then shows nothing except that the picture was a good likeness (p. 134)."

In fact, Marshall wrote much more extensively on the suggestive procedure than did the majority, including:

> The use of a single picture (or the display of a single live suspect, for that matter) is a grave error, of course, because it dramatically suggests to the witness that the person shown must be the culprit. Why else would the police choose the person? And it is deeply ingrained in human nature to agree with the expressed opinions of others – particularly others who should be more knowledgeable – when making a

> difficult decision. In this case, moreover, the pressure was not limited to that inherent in the display of a single photograph. Glover, the identifying witness, was a state police officer on special assignment. He knew that D'Onofrio, an experienced Hartford narcotics detective, presumably familiar with local drug operations, believed respondent to be the seller. There was at work, then, both loyalty to another police officer and deference to a better-informed colleague. Finally, of course, there was Glover's knowledge that without an identification and arrest, government funds used to buy heroin had been wasted (p. 136).

Fundamental Majority versus Minority Disagreement about Deterrence

The *Manson* opinion contains only brief allusions to the deterrent value of the reliability approach. Does the reliability approach adopted in *Manson* serve to deter police from using suggestive procedures? Even though they acknowledged that the per se exclusion approach that preceded it had the stronger deterrent value, the majority clearly believed that the reliability approach does have a significant deterrent effect. Simply put, the majority wrote "the police will guard against unnecessarily suggestive procedures under the totality [reliability] rule...for fear that their actions will lead to the exclusion of identifications as unreliable (p. 113)." Marshall's dissenting opinion on the deterrent aspect was equally brief. Marshall noted that the deterrence consideration "favors the per se rule. Indeed, it does so heavily, for such a rule would make it unquestionably clear to the police that they must never use a suggestive procedure when a fairer alternative is available. I have no doubt that the conduct would quickly conform to the rule (p. 126)."

The relatively short shrift given to the deterrence issue in *Manson* stands in considerable contrast to the centrality of deterrence considerations that we bring into the current analysis. In particular, we argue that psychological science on suggestive procedures uncovered since *Manson* gives us strong reasons to believe that there is little disincentive for police and prosecutors to avoid suggestive procedures under *Manson*. In fact, we argue that *Manson* has had the unintended consequence of setting up conditions that create a positive incentive for police to use suggestive procedures.

The Science

The science on eyewitness identification began to unfold in a programmatic way in the late 1970s. But, despite the temporal contiguity to *Manson*, which was decided in 1977, the science did not develop in response to *Manson* or any other ruling by courts. In fact, even though the late 1970s is generally regarded as the birth of modern eyewitness research, psychological scientists have been questioning the accuracy of eyewitnesses and trying to get the attention of the legal system for over 100 years (see the excellent historical treatment by Doyle 2005). The development of programmatic research on eyewitness identification in the mid to late 1970s was driven at least in part by the provocative experiments of Elizabeth Loftus, who showed that interesting theoretical questions about memory could be examined using procedures that were relevant to the legal system's heavy use of eyewitness evidence (Loftus 1979). Also in the late 1970s, a framework emerged for distinguishing between variables that were under the control of the justice system, called system variables, and those that the justice system could not control, called estimator variables (Wells 1978). The psychological scientists who began programmatic studies of eyewitnesses were mainly cognitive psychologists and social psychologists. For the most part, their work did not appear in law reviews or other publication outlets readily accessible to legal practitioners or legal policy makers, but instead appeared in mainstream peer-reviewed journals in psychology.

Methods and Criticisms of the Science

The science that emerged operated primarily on the experimental model that psychology long ago borrowed from other sciences, such as biology and physics. Specifically, researchers created events (e.g., live staged crimes or video simulations of crimes) that unsuspecting people witnessed. At that point, people had become eyewitnesses. These witnesses could then be questioned about what they witnessed, shown a lineup, and so on. Because the events were created by the researchers, there was no ambiguity about the actual events that were witnessed, including the actions of the actors, words that were spoken, and the identity of the culprit. Accordingly, witness errors could be scored. Within this basic experimental paradigm, systematic manipulations could be made to witness characteristics, viewing conditions, lineup structure, and so on, to study how these variations affect eyewitness errors. A typical experiment will have anywhere from 100 to 300 or more participant-witnesses to stabilize the data and test various hypotheses among subsets of the sample.

It is important to understand that the primary purpose of these experiments, which now number in the hundreds, has been to establish cause-effect relations among variables. For example, one experiment used live staged crimes to see whether placing an innocent person among dissimilar fillers

in a lineup would lead to higher rates of misidentification than if the innocent person were placed among similar fillers (Wells et al. 1993). The researchers did not claim that the obtained rate of misidentifications in the dissimilar-fillers condition (47%) represents a rate that would be expected in actual cases. Instead, the authors noted that the obtained rate was significantly higher than the rate obtained in the similar-fillers condition (11%). Hence, the conclusions from experiments concern cause-effect relations (poorly selected lineup fillers increase rates of misidentification) that relate to *relative risk*, not rates of absolute risk that can be applied to actual cases. At the same time, researchers generally conclude that the cause-effect relation itself can be applied to what would be expected in actual cases.

Those in the legal system who resist conclusions from eyewitness identification experiments generally note several arguments. One is that eyewitness identification experiments commonly use college students as witnesses, whereas eyewitnesses to actual crimes would rarely be a college student. It is true that college students are the most common subjects in these experiments, in large part out of convenience. However, many studies have used young children, adolescents, middle-aged persons, and the elderly. Findings in these studies consistently show that college students outperform these other populations (see reviews by Pozzulo 2006; Bartlett and Memon 2006). College students are less influenced by suggestive procedures, more likely to make accurate identifications, and so on. Therefore, if anything, college students as witnesses underestimate the magnitude of the problem. Another criticism is that the witnesses in experiments do not experience the type of stress and fear that often accompany actual crime witnessing, which some critics argue could make their memories more reliable. It is true that psychological scientists are prohibited by ethical considerations from drawing guns on people or otherwise inducing extreme stress. Nevertheless, experiments that have managed to induce significant stress have shown that stress interferes with, rather than helps, the formation of reliable memories (e.g., Morgan et al. 2004). Finally, critics contend that the experimental witnesses know that a mistaken identification has no serious consequences, whereas eyewitnesses in actual cases would be too cautious to make these errors. On this point, archival studies of actual eyewitnesses to serious crimes show that, among eyewitnesses who select someone from a lineup, they select a known innocent filler 30% of the time on average (Behrman and Davey 2001; Behrman and Richards 2005; Slater 1994; Valentine et al. 2003; Wright and McDaid 1996; Wright and Skagerberg 2007). Clearly, the fact that these were real cases with serious consequences did not lead these witnesses to be too cautious to identify an innocent person. In any case, these criticisms miss the point of the research. The point of the research is to show cause-effect relations, not overall levels of mistaken identification.

Key Findings Relating to Manson

The eyewitness identification literature is much too large to review in detail in this article. The *Manson* case, however, provides a focus on a subset of the eyewitness science literature because it is somewhat circumscribed around six key concepts, namely, procedural suggestiveness, eyewitness certainty, view, attention, passage of time, and verbal descriptions. We discuss each in turn.

Procedural Suggestiveness in Lineups

From the perspective of psychological science, a procedure is suggestive if it induces pressure on the eyewitness to make a lineup identification (a suggestion by commission), fails to relieve pressures on the witness to make a lineup selection (a suggestion by omission), cues the witness as to which person is the suspect, or cues the witness that the identification response was correct or incorrect. The most common ways in which eyewitness scientists have studied suggestiveness in lineup procedures have been to look at pre-lineup instructions, lineup composition, and suggestive behaviors of lineup administrators.

Pre-lineup instructions have focused primarily on whether or not the witness is told prior to viewing the lineup that the actual culprit might not be in the lineup. At its simplest level, instructing the eyewitness that the culprit might not be in the lineup can be thought of as a procedure to relieve pressure on the eyewitness to make a selection. Indeed, lineups sometimes do not include the actual culprit, which means that the correct answer is sometimes "none of the above."[4] To the extent that eyewitnesses naturally assume that the police have the real culprit in the lineup, the suggestiveness is implicit in the procedure itself. Although a failure to instruct the eyewitness that the culprit might not be in the lineup is not suggestiveness by commission (action), it is suggestiveness by omission (inaction). On this point, the research findings are very clear: Mistaken identifications from culprit-absent lineups are significantly higher when the witness is not given the pre-lineup instruction than when the witness is given the

[4] It is not known how often the suspect in a lineup is the actual culprit, but absence of the culprit in the lineup simply means that the police have focused their investigation on the wrong person. Because there is no reasonable-cause criterion for placing a suspect in a lineup, police are free to conduct a lineup on a mere hunch, which can lead to fairly high rates of culprit-absent lineups being shown to witnesses (Wells 2006). In all the DNA exoneration cases involving lineups, the actual culprit was not in the lineup and the witnesses made identifications nevertheless.

pre-lineup instruction (Malpass and Devine 1981; see meta-analysis by Steblay 1997; more recent meta-analysis by Clark 2005). Given our understanding of the psychological processes involved in the instruction effect, it is reasonable to infer that the suggestiveness of the situation (and, hence, rates of misidentification in culprit-absent lineups) would be further enhanced by any active pre-lineup suggestions that the culprit is in the lineup. This would include telling the eyewitnesses that the culprit has been found, that the police know who did the crime, or that they already have plenty of evidence against the person.

Lineup composition refers to the qualities of the fillers in the lineup. A lineup filler is a known innocent person who is in the lineup to help make the procedure fair. A proper lineup has only one suspect (who might or might not be the culprit) and the remaining lineup members are fillers. One of the ways to think about the role of fillers is that they help to establish whether the witness' memory is reliable enough to avoid selecting a filler. But, a dominant reason for using fillers is to help ensure that the procedure is not suggestive of which person is the focus of the police investigation. Accordingly, the qualities of these fillers are presumed to be critical to maintaining low levels of suggestiveness. Research consistently supports the view that using fillers who do not fit the eyewitness' previous verbal description of the culprit dramatically increases the chances that an innocent suspect who fits this description will be mistakenly identified (e.g., Clark and Tunnicliff 2001; Lindsay and Wells 1980; Wells et al. 1993). For this reason, psychological scientists have drawn a sharp distinction between the *nominal* size of a lineup and the *functional* size of a lineup and have devised ways to measure functional size (Wells et al. 1979). Nominal size refers to a mere count of the number of lineup members (e.g., six if there are five fillers and one suspect), whereas functional size refers to an underlying concept of the number of plausible lineup members. If an eyewitness described the culprit as a white male in his mid 20 s with short, dark hair, for instance, then using three men in their 40 s as fillers has no effect on nominal size, but functional size is reduced by three. Eyewitness researchers measure functional size by showing the lineup to *mock witnesses* who, armed with only the witness' verbal description of the culprit, then attempt to pick out the suspect. Functional size is then defined as N/S, where N is the number of mock witnesses and S is the number of mock witnesses who select the suspect. Hence, if there were 100 mock witnesses and 50 picked the suspect, the functional size would be 2.0; if 20 picked the suspect, functional size would be 5.0 and so on. There are other calculations that have been proposed, such as *effective size* and *defendant bias* (see Malpass 1981), that use the same data collection methodology (mock witnesses). But the general idea is the same, namely to attempt to assess lineup fairness. An entire issue of the journal Applied Cognitive Psychology is devoted to the question of how to best assess lineup fairness (Lindsay and Malpass 1999). The issues are somewhat more complex than they first appear, however, because there are circumstances in which using the eyewitness' verbal description of the culprit for selecting fillers is not an adequate suggestiveness safeguard. Suppose, for instance, a man became a suspect because he resembles the culprit's image from a surveillance video. In such a case, fillers would have to be selected because they are similar to the video image rather than merely because they fit the general verbal description given by the eyewitness.

Show-ups are not lineups at all, but instead are procedures in which the eyewitness is shown only one person or a photo of one person without any fillers. Recall that *Manson v Braithwaite* was a show-up procedure and the Court found that it was unnecessarily suggestive but, based on the second prong (the reliability test), did not exclude it from evidence. Here, the results of experiments have led psychological scientists to refine the nature of what is meant by suggestiveness as it relates to show-ups in contrast to lineups. Whereas courts have generally construed of show-ups as a form of pressure on the witness to make a positive identification, eyewitness experiments tend to show that rates of positive identification are actually *lower* for show-ups than for lineups (see meta-analysis by Steblay et al. 2003). Show-ups, however, are suggestive in a different way, namely they suggest to the witness *which* person to choose. The advantage of a lineup is that errors in choosing will be distributed across the fillers (a relatively harmless error) instead of loading up on the suspect, whereas errors in a show-up will always be the more consequential error of identifying an innocent suspect. As a result, a show-up is worse than a good lineup (i.e., a lineup that has at least five good fillers), but better than a bad lineup (e.g., one in which there are two or fewer good fillers).

Lineup administrator suggestiveness refers to verbal or nonverbal behaviors of the lineup administrator that can influence which person the witness identifies or how the witness feels about the identification. [For reasons that will become apparent, we will delay discussion of the latter aspect (influencing how the witness feels about the identification) for our later sections on eyewitness certainty, view, and attention.] It is important to note that most initial identifications of criminal suspects are obtained using photo-lineups rather than live lineups. Unlike live lineups, which might inhibit lineup administrator suggestiveness because defense counsel is present, there is no right to defense counsel at photo-lineups. Instead, photo-lineups are usually conducted by the case detective who directly interacts with the witness in what is, in effect, a conversation about photos. This creates a situation very similar to

one that has been extensively studied by psychological scientists in other contexts in which a tester's knowledge or expectations influence the person being tested in a direction that is consistent with the tester's knowledge or expectations (see Rosenthal 2002; Rosenthal and Rubin 1978 for extensive reviews and treatments). These effects of the tester on the person being tested are the reason that double-blind procedures are used in scientific experimentation. There is no presumption that these tester effects are the result of intentional efforts by the tester or that the tester is aware of influencing the person being tested. Although there could be intent, such as placing a thumb on the suspect's photo when handing the array to the witness, the concern here is with the kinds of influences that are unintentional, natural byproducts of the interaction. There are many ways that a lineup administrator can influence an eyewitness' identification decision. For instance, the eyewitness might call out the number of a filler photo, and the lineup administrator, knowing that the photo is a mere filler, might urge the witness to make sure she has looked at all the photos before making a decision. Whether intended or not, the message is clear to the witness that the suspect is one of the other photos. In contrast, the mere utterance of the number of the suspect's photo could yield a very different reaction from the lineup administrator, such as "Good, tell me what you remember about that guy." That would lead the witness to stick with that photo even if she had uttered the numbers of filler photos previously. Even without speaking, a lineup administrator can influence an eyewitness through facial expressions and body movements such as head nodding or head shaking. Furthermore, the lineup administrator has a great deal of discretion in deciding when the identification session is over. If the witness picks a filler, the tendency might be to wait to see if she changes her mind or ask if there is anyone else who stands out. If the witness picks the suspect, in contrast, the session is quickly ended. These discretionary behaviors by the lineup administrator are not necessarily intentional and the lineup administrator might not even be aware that she or he is doing it. Instead, these are natural behaviors that testers display when they think that they know the correct answer or have expectations about how the tested person will or should behave.

Experimental studies in which lineup administrators are led to believe (erroneously) that a particular lineup member is the culprit show that witnesses are influenced by what the lineup administrator was led to believe (Haw and Fisher 2004; Phillips et al. 1999; Russano et al. 2006). The double-blind lineup procedure was developed to prevent these suggestive influences of the lineup administrator (Wells 1988; Wells et al. 1998). A double-blind lineup is one in which a neutral lineup administrator (one who does not know which person or photo is the suspect and which are fillers) administers the lineup to the eyewitness.

Multiple presentations of the suspect are yet another way in which a procedure can suggest strongly to the eyewitness which person to identify. This type of situation can occur in a variety of ways. For instance, the eyewitness might first be shown a photo-lineup from which no identification was made. Later, a live lineup is used in which the only person in common to both procedures is the suspect. [It is nearly always true that the only person in common between the photo-lineup and a live lineup is the suspect because fillers from photo-lineups would rarely be available or findable for a live lineup.] Sometimes, an eyewitness will fail to identify the suspect from a photo-lineup and be shown a second photo-lineup later with that same suspect but new fillers. This will sometimes occur when the police think that the first photo might not have resembled the appearance of the suspect very well and later come across one that they think is better. Here, again, the procedure is highly suggestive to the extent that the witness can discern which person is common to both photo-lineups. Precisely these types of effects have been found in eyewitness identification experiments: Witnesses who encountered a innocent person's photo in an initial identification procedure were more likely to misidentify a different photo of him in a second procedure even if they did not misidentify him in the first procedure, but the effect is especially strong if they also misidentified the person in the first procedure (Brigham and Cairns 1988; Gorenstein and Ellsworth 1980; Hinz and Pezdek 2001; see meta-analysis by Deffenbacher et al. 2006). Although experiments have not directly tested the question of in-court identifications that occur after a pre-trial lineup, our understanding of transference and commitment effects leads to the reasonable inference that a mistaken identification prior to trial is likely to be replicated during an in-court identification.

Additional remarks on suggestiveness. The findings of controlled experiments on suggestiveness effects in eyewitness identification are not surprising to psychological scientists. And, as far as we can discern, many of these suggestiveness effects are not likely to surprise actors in the legal system. We note, for example, that most courts consider show-ups to be suggestive and that they routinely consider the quality of fillers used in lineups to be a legitimate concern. We are less certain that the legal system appreciates the ways that lineup administrators influence the results or fully appreciate the import of proper pre-lineup instructions. Furthermore, there is an apparent belief that damage from an unfair identification procedure can be undone by simply following it with a fair procedure. Even Justice Marshall, in his dissenting opinion in *Manson v. Braithwaite* claimed, "When a prosecuting attorney learns that there has been a suggestive confrontation, he can easily arrange another lineup under scrupulously fair conditions (p. 128)." This "retesting" view is diametrically opposed to

the dominant view among psychological scientists that, once an eyewitness has mistakenly identified someone, that person "becomes" the witness' memory and the error will simply repeat itself. Perhaps the biggest difference between the views of psychological scientists and those in the legal system is the legal system's belief, inherent in *Manson v. Braithwaite*, that concerns about suggestive identification procedures can be trumped by the types of considerations used in the second prong (the reliability test using the *Manson* criteria).

Research Related to the Manson Criteria

Recall that the analysis of suggestiveness is only the first prong in deciding the admissibility of eyewitness identification evidence. If the court rules that the procedure was not unduly suggestive, the identification evidence is admitted. If the procedure was found to be suggestive, then the court is to consider the question of whether the identification was reliable nevertheless based on five criteria. In principle, there is nothing inherently flawed about the idea of a two-pronged test of this sort. Imagine, for instance, that a victim-witness had been abducted and held for 3 months during which the culprit's face was never covered and there was full light (repeated opportunity to view), the victim studied the face repeatedly (repeated attention), the victim described the face in great detail, including unique features (excellent description), and the witness identified the suspect with total certainty within minutes after escaping. Surely, in this case we would not care if the identification procedure had multiple characteristics of a highly suggestive procedure (e.g., a show-up, failure to warn the witness that this might not be the culprit, and so on). Therefore, we concede that at some level these reliability factors (e.g., 3 months repeatedly studying the face) would appropriately trump concerns about suggestive procedures. However, these are not the situations in which the *Manson* reliability criteria are being applied on an everyday basis and not the situation in the *Manson* case. Justice Marshall estimated that the witness in *Manson v. Braithwaite* likely saw the person for only 5 or 10 s, there were distractions from others in the apartment, the door was barely open, the identification occurred days later, the witness might not have been certain at all at the time of the single-photo identification, and the description was very weak.

In this section, we examine the *Manson* reliability criteria in the context of the science that has emerged since *Manson*. It is important to note that there are three themes in this analysis. One theme concerns the fact that three of the five *Manson* criteria, namely view, attention, and certainty, are what psychological scientists call *retrospective self-reports*. Psychological scientists are highly skeptical of retrospective self-reports because of well-known tendencies for such reports being at odds with objective facts. It has been well established, for example, that people retrospectively report that variables affected them that in fact did not affect them and people also report that variables did not affect them that in fact did affect them (Nisbett and Wilson 1977). Part of the problem is that retrospective self-reports are highly malleable in response to even slight changes in context (e.g., who is asking the question), the social desirability of the responses, the need to appear consistent, and reinterpretations of the past based on new events. At another level, psychological scientists find it somewhat odd that an eyewitness, whose credibility as a witness is being assessed, would be asked to report on his or her own credibility. It seems a bit like assigning a student's grade based on his or her self-reports of how hard they studied.

A second theme running through this analysis of the *Manson* factors is the precarious nature of the relation between the *Manson* factors and eyewitness identification accuracy. Some of these relations clearly are not linear and the *Manson* factors themselves are not independent of each other.

The third theme that runs through this analysis of the *Manson* factors, and perhaps the most important one, is that at least three of the *Manson* factors are not independent of the suggestive procedure itself. In other words, the use of suggestive procedures can lead the eyewitness to enhance (distort) his or her retrospective self-reports in ways that help ensure the witness' high standing on the *Manson* criteria, thereby leading to a dismissal of the suggestiveness concern. We will call this latter process, in which suggestiveness causes inflated status on the *Manson* factors, which in turn causes courts to discount the suggestiveness, the *suggestiveness augmentation effect*. We believe that the suggestiveness augmentation effect is a very serious problem for the two-prong totality approach guiding *Manson*. We believe that the suggestiveness augmentation effect accounts at least in part for the rarity of suppressing identifications obtained from highly suggestive procedures, and we believe this effect creates a disincentive for police and prosecutors to jettison suggestive procedures.

View

There can be no doubt that the witness' opportunity to view the culprit is relevant at some level. For example, if the witness was a kilometer from the culprit's face, humans could not store a reliable visual image. But, what is a reliable distance? The relation between distance and face perception is not linear. For instance, there is no diminishing effect of distance up to 25 feet. After 25 feet, face perception diminishes and accurate face identification for

people with normal vision drops to zero at approximately 150 feet (Loftus and Harley 2005). The maximum, 150 feet, probably would surprise most people because they recall experiences in which they seem to have recognized a familiar person's face from distances much greater than 150 feet. But, in some very clever experiments, researchers have shown that people are subject to a *visual hindsight illusion.* Specifically, when people were told ahead of time the identity of the person observed from a distance, they estimated that the face was clear and recognizable at distances that simulated several hundred feet. When actually tested under conditions in which they were not told the identity ahead of time, however, performance reached zero at approximately 150 feet (see Harley et al. 2004; Loftus and Harley 2005). If you already know the identity of the person, the mind can be pretty good at "filling in" the image at several hundred feet. But this is not the situation for the typical eyewitness who is looking at a stranger's face from a distance.

Exposure time to a face does show a relation to the chances of an accurate recognition decision, but a meta-analysis indicates that the relation is relatively weak (Shapiro and Penrod 1986). Commonly, opportunity to view is assessed by asking the eyewitness to estimate his or her own exposure time (e.g., "How long was the culprit's face in view?") and occlusions (e.g., "Was your view blocked during any part of this time?"). In fact, however, eyewitnesses' estimates of time during witnessing are greatly overestimated (e.g., Shiffman and Bobko 1975), especially when there is stress or anxiety at the time of witnessing (e.g., Sarason and Stroops 1978). Furthermore, the proportion of time that a person's face is occluded is greatly underestimated by eyewitnesses (Wells and Murray 1983). Sometimes, it is possible to rely on something other than the self-report of the witness to determine issues of visual occlusion. For instance, if it can be established exactly where the witness was standing and where the culprit was, analyses of the actual scene might show that a tree, building, or some other fixed object occluded the witness' view. Nonetheless, this still requires a self-report about where the witness was standing in relation to the culprit and would fail to account for ephemeral occlusions, such as another person standing in the way or a car being parked at a particular location at that time.

Although estimates of distance, exposure time, and reports of visual occlusions are commonly sought from witnesses, the usual shortcut question to get to the bottom line is something like "Were you able to make out details of the culprit's face from where you observed the event?" Here is where things get especially interesting. In a series of published experiments across a variety of psychological laboratories, witnesses to simulated crimes were shown lineups that did not include the culprit and made mistaken identifications. After their mistaken identification, a suggestive remark was made by the lineup administrator that seemed to confirm their selection ("Good, you identified the suspect in the case") or no suggestive remark was made by the lineup administrator. Later, all of the witnesses were asked, "How good was the view that you had of the culprit?" and "How well could you make out details of the culprit's face while witnessing the crime?" Of course, all these witnesses had the same (quite poor) view of the culprit. And, those who were not given the confirmatory suggestive remark seemed to understand rather well that their view was very poor. In the original experiment by Wells and Bradfield (1998), for instance, none reported that their view was good or excellent. Among those who were given the confirmatory suggestive remark, however, 27% said that their view was good or excellent. Similarly, among those who were not given the confirmatory suggestive remark, none reported that they could easily make out details of the face. Among those given the suggestive remark, in contrast, 20% reported that they could easily make out details of the face. Hence, the suggestive remark managed to lead a fairly large portion of mistaken eyewitnesses who had very poor views and little or no ability to make out face details to self-report that they had a good view and could easily make out details of the face.

This retrospective inflation of what witnesses say about their view also occurs when the suggestiveness comes from the use of poor lineup fillers (Semmler and Brewer 2007). In other words, the use of poor lineup fillers, a form of suggestiveness that places an innocent suspect at greater risk, leads eyewitnesses to report that they had a better view, and hence the suggestive procedure actually enhances the witnesses' standing on the view criterion of *Manson.*

Attention

Clearly, attention is necessary for the processing of any stimulus. However, the Court seems to equate the amount of time that the witness spent looking at the culprit's face with attention. Generally, the amount of time spent looking at a stimulus has not been considered to be a particularly strong predictor of the ability of the witness to process the stimulus. Instead, psychological scientists have emphasized the *type of processing* that is occurring while attending to a stimulus to be much more important. In the case of faces, for example, devoting attention to specific facial features (e.g., nose, eyes, chin, mouth) can take a considerable amount of time when compared to making a global or holistic judgment of the face. Yet, it is the holistic judgments, which can occur fairly rapidly, that lead to a better ability later to recognize that face among filler faces (e.g., Bower and Karlin 1974; Patterson and Baddeley 1977).

On the other hand, for purposes of being able to reconstruct the face (e.g., using a composite drawing system), attention to specific facial features is superior to the global judgments (Wells and Hryciw 1984).

Humans have a limited capacity for processing information. As a result, attention paid to one stimulus necessarily results in a reduction of attention paid to other stimuli (Kahneman 1973). The *weapon focus effect* illustrates this phenomenon. Eyewitness experiments have consistently shown that the presence of a weapon (e.g., a gun or knife in the hand of the culprit) leads to a reduced ability to recognize the face of the culprit later (see Steblay 1992, for a meta-analysis of these studies). The dominant explanation is that the weapon draws attention, thereby pulling attention away from the culprit's face. Eye tracking research has generally confirmed the selective attention interpretation of weapon focus effect (Loftus et al. 1987). Also, controlled studies have shown that the better the eyewitness can describe peripheral aspects of the crime scene (e.g., there was a Coke on the table, I noticed that the window was open), the poorer is their memory of the culprit's face (Wells and Leippe 1981).

Attention matters, but the issue of how to assess the amount of attention and type of attention that the eyewitness engaged in is very unclear. The legal system takes the very straightforward approach of simply asking the eyewitness questions such as "Did you attend to the culprits face?" or "Where did you direct your attention?" or "How much attention did you pay to the appearance of the culprit?" Hence, attention is a self-report. The system is even more reliant on self-reports for the attention variable than it is for the view variable because at least some aspects of view can occasionally be checked against external assessments of the crime scene (checking distances and lighting conditions).

Attention is a purely psychological variable that cannot be checked against any objective facts in an actual case.[5] Accordingly, the question arises as to whether self-reports of attention are reliable as indicators of eyewitness identification accuracy. The question is much more difficult to answer than it appears, but there is one consistent finding that bears directly on this question as it relates to a *Manson*-type test of reliability in the context of suggestive identification procedures. Specifically, numerous experiments show that confirmatory suggestive remarks following a mistaken identification (e.g., "Good, you identified the suspect") lead witnesses to inflate their estimates of how much attention they paid to the culprit during the witnessed event (Bradfield et al. 2002; Dixon and Memon 2005; Douglass and McQuiston-Surrett 2006; Hafstad et al. 2004; Neuschatz et al. 2005; Skagerberg 2007; Smith et al. 2000; Wells and Bradfield 1998; Wells and Bradfield 1999; Wells et al. 2003; see meta-analysis by Douglass and Steblay 2006). The post-identification feedback effect occurs not just in lab-based experiments, but also occurs for actual eyewitnesses to serious crimes (Wright and Skagerberg 2007). In effect, this consistent finding means that witness' reports of their attention are not only malleable, but also that reports of how much attention was paid are affected by suggestive procedures, in this case suggestive feedback.

It is not just suggestive feedback that leads to retrospective distortions of witness' reports of their attention. This same phenomenon of inflating their reports of how much attention they paid occurs when a suggestive photo-array (i.e., the fillers do not fit the witness' description of the culprit) is used (Semmler and Brewer 2007). Again, we see that a suggestive procedure actually enhances the eyewitnesses' standing on a *Manson* reliability factor.

Certainty

The certainty that an eyewitness expresses in his or her identification is one of the most researched variables in the eyewitness identification literature. This is because almost any eyewitness identification experiment assesses the eyewitnesses' certainty in their identification decisions. The wording of the key question varies from experiment to experiment (e.g., "How certain are you that you identified the right person?" "How confident are you in your identification?"), but the concept being measured is how much faith the eyewitness has in his or her own identification. Even without the status that the Court has given to certainty in the *Manson* reliability test, certainty plays a central role in eyewitness identification evidence. The certainty of an identification is going to affect decisions as to whether to charge the suspect with the crime, whether to proceed to trial, and whether the testimony will have a strong impact on jurors (e.g., Bradfield and Wells 2000; Cutler et al. 1988; Fox and Walters 1986; Wells et al. 1979; Wells et al. 1981; Whitley and Greenberg 1986). Hence, the question of the relation between eyewitness identification accuracy and witness certainty is important at several levels, not just for purposes of deciding the admissibility of the identification.

Calculations of the relation between certainty and accuracy in eyewitness identification experiments can be done in a number of ways, but the most common method is the use of the point-biserial correlation coefficient. Based on a large number of eyewitness identification experiments conducted in dozens of different labs, a meta-analysis of the certainty-accuracy correlation showed that if the analysis is restricted to only those witnesses who made an

[5] In laboratory experiments, non-self-report measures, such as directed gaze and eye movements can be measured to study attention. But actual cases are necessarily dependent on retrospective self-reports of attention.

identification the average correlation could be as high as 0.41 (Sporer et al. 1995). If non-identifying eyewitnesses are included (i.e., those who erroneously rejected the lineup and those who correctly rejected the lineup), then the correlation is considerably lower than 0.41. What does a 0.41 correlation mean? One way to think about a 0.41 correlation is to compare it to something with which people have some experience. For instance, the correlation between height and gender in humans is considerably greater than 0.41. That means that we could better predict whether someone was male or female based on their height than we could predict whether a witness was accurate or inaccurate based on their certainty. At the same time, however, a 0.41 correlation is far from being useless. Suppose, for instance, we took 100 eyewitnesses, half of whom had made an accurate identification and half of whom had made a mistaken identification. If the certainty-accuracy correlation is 0.41, then approximately 70% of the witnesses who are above average in certainty would be accurate (30% mistaken) and only 30% of those who are below average in certainty would be accurate (70% mistaken). These figures, however, change depending on what the presumed base rate is for accuracy, so things begin to get complex and at some point are unsolvable without knowing several other things that we cannot actually know in a real case. Suffice to say that psychological scientists have generally concluded that eyewitness certainty, although of limited utility, can have some diagnostic value.

Despite the acknowledgment that eyewitness identification certainty can have some diagnostic value, the diagnostic value of eyewitness identification certainty in cases where there have been suggestive procedures represents a very different situation. The problem with using eyewitness certainty as a second-prong reliability factor in *Manson*-type situations is that it has already been determined (under the first prong) that a suggestive procedure was used with this eyewitness. As with view and attention, we know that confirmatory suggestive remarks from the lineup administrator consistently inflate eyewitness certainty for eyewitnesses who are in fact mistaken (Bradfield et al. 2002; Dixon and Memon 2005; Douglass and McQuiston-Surrett 2006; Hafstad et al. 2004; Neuschatz et al. 2005; Semmler and Brewer 2006; Semmler et al. 2004; Skagerberg 2007; Wells and Bradfield 1998; Wells and Bradfield 1999; Wells et al. 2003; see meta-analysis by Douglass and Steblay 2006). In one study, for example, fewer than 15% of eyewitnesses who had mistakenly identified someone stated that they were positive or nearly positive in their identification. However, when given a suggestive statement that appeared to confirm their identification ("Good, you identified the actual suspect"), a full 50% of the mistaken eyewitnesses said that they were positive or nearly positive in their identification. It is important to note that the question asked of the eyewitnesses was "How certain were you *at the time of your identification* that you had identified the right person?" Because the suggestive remark occurred *after* their identification, the suggestive remark could not have influenced how certain they were at the time of their identification. Hence, the suggestive remark is distorting their recollections of certainty; they no longer remember that they were uncertain at the time of the identification and instead think that they were certain all along. It is important to note as well that this suggestive confirmatory effect is stronger for mistaken eyewitnesses than it is for accurate eyewitnesses, thereby making inaccurate eyewitnesses look more like accurate eyewitnesses and undermining the certainty-accuracy relation (Bradfield et al. 2002). A suggestive lineup procedure in which the suspect stands out as the only lineup member who fits the description has similar effects; witnesses are more confident in their identifications of the suspect when the suspect stands out than when the suspect is surrounded by appropriate fillers, regardless of whether the suspect is guilty or not (Wells et al. 1993; Semmler and Brewer 2007).

Once again, we see that suggestive procedures distort an eyewitness' standing on a *Manson* reliability factor. Because the *Manson* reliability factors come into consideration once it is already determined that a procedure was suggestive, courts are using the *Manson* reliability factors under precisely the conditions that make the *Manson* criteria questionable and likely misleading.

Descriptions

The Court made a curious and interesting error in phrasing the description criterion as "the accuracy of the description." Clearly, the accuracy of the eyewitness' pre-lineup description can only be determined if that description is compared to the physical characteristics of the *culprit*. Saying that the description is accurate because it fits the physical characteristics of the *defendant* presumes that the defendant and the culprit are the same person. And yet, that presumption is the exact proposition under contention. Undoubtedly, the Court meant to say that the criterion was one of *consistency* between the physical appearance of the culprit and the witness' pre-lineup description and the amount of *detail* that was contained in the witness' description. Hence, a witness would have a poor standing on the description criterion if there were significant inconsistencies between the description and the characteristics of the defendant and/or the description was vague and general.

What does the science say about the relation between description consistency and eyewitness identification accuracy and between description completeness (number of descriptors used) and eyewitness identification

accuracy? In general, there appears not to be much of a relation. Pigott and Brigham (1985) found no meaningful correlation between descriptions and eyewitness identification accuracy. Wells (1985), using a much broader sample of 88 faces, found no correlation between description completeness and identification accuracy but a statistically significant (albeit low) correlation of 0.19 between description consistency and identification accuracy. Importantly, however the correlation between description completeness and identification accuracy was not attributable to good describers being good identifiers, but instead was attributable to the fact that faces that are easier to describe are also easier to identify.

The general failure of verbal descriptions to predict eyewitness identification accuracy is not surprising to memory scientists. Eyewitness identification is a form of recognition memory, whereas verbal description is a form of recall memory. Recognition memory occurs when a stimulus is presented to a person and the person decides whether it is the same stimulus that was experienced earlier. Recall memory occurs when a person is given some general context (e.g., yesterday or 2 months ago) and then is asked to generate words, drawings, or some other reproduction of the previously experienced stimulus. In the case of faces, studies suggest that the psychological processes that give rise to good recall and those that give rise to good recognition are not the same. For instance, Wells and Hryciw (1984) found that having people study the individual features of a face (e.g., nose, eyes) made them good at describing the face but poor at recognizing the face, whereas having people make global judgments of the face made them good at recognizing the face but poor at describing the face.

But even a small relation between description consistency and identification accuracy, like that shown by Wells (1985), fails to capture two very important dynamics in actual cases that should give pause to relying too much on consistency between the description and the characteristics of the identified person. First, the pre-lineup description that the eyewitness gave of the culprit commonly is used by police investigators to decide which person they consider a likely suspect in the first place. Consider, for instance, an innocent person like Kirk Bloodsworth, the first person who was sentenced to death and later exonerated by DNA (Junkin 2004). Bloodsworth had never been in trouble with the law, but Bloodsworth so closely matched the witness' descriptions of the culprit (and the composite drawing) that he became the suspect *because of* that similarity and was identified in a photo lineup. Obviously, in the Bloodsworth case the consistency between the pre-lineup description and the physical characteristics of the defendant (Bloodsworth) were striking. But this striking consistency was not the result of an accurate eyewitness; Bloodsworth was, after all, innocent. Instead, the similarity between the pre-lineup description and the characteristics of the suspect was the byproduct of a natural suspect-generating process that is bound to show this consistency regardless of whether the suspect is guilty.

The second important dynamic in actual cases that should give pause to relying much on consistency between the description and the characteristics of the identified person is the fact that eyewitness misidentifications from lineups are not random. Eyewitnesses tend to select the person who looks most like their memory of the culprit (Wells 1984) and will readily select an innocent person if that person fits the eyewitness' pre-lineup description better than do the lineup fillers (e.g., Lindsay and Wells 1980; Wells et al. 1993). In other words, when misidentifications occur, they tend to load up on someone who fits the eyewitness' pre-lineup description of the culprit.

Imagine now a hearing in which a lineup was found to be suggestive in first inquiry of *Manson* because the fillers did not fit the eyewitness' pre-lineup description (the classic biased lineup). Hence, the second inquiry focuses on the description criterion of *Manson* and it is noted that the description was good because it fits (is consistent with) the characteristics of the defendant. Here, we see that the reliability factor is used to decide that the suggestiveness was not a problem, and yet this is precisely the kind of consistency between description and identification that would be expected even if he was not the culprit.

Time between Crime and Confrontation

Justice Marshall's dissenting opinion was correct in noting that the greatest memory loss following an event occurs soon after the event. More specifically, the shape of the forgetting curve is a negatively decelerating function of time. This means that each time frame (whether measured in minutes, hours, or days) produces a greater loss in memory than the same time frame that follows it. Hence, more memory is lost in the first hour than in the second hour, more in the first day than the second day, more in the first week than in the second week, and so on. This forgetting function is one of the oldest phenomena in scientific psychology, dating back more than 100 years (e.g., Ebbinghaus 1885).

There are nevertheless two problems with making good practical use of the forgetting curve. First, although the shape of the curve is generally reliable, the absolute numeric quantities of memory loss that apply to a given time (e.g., after 1 day, 2 days, etc.) vary dramatically from situation to situation. For some situations (such as remembering a person's name), the percentage of memory loss might reach 50% after only a few minutes, for other situations (such as remembering the name of a movie) it might take a few months, and for other situations (such as remembering an old

phone number) it might take several years. The shape of the curve is presumed to be constant, but the time frame itself is not. The second problem is that the rate of forgetting is readily altered via rehearsal and related cognitive processes. A person's name might be readily forgotten (even within seconds) if an individual were distracted immediately after hearing the name or it might be retained for years if the individual rehearsed the name repeatedly and regularly over a long period of time.

In general, eyewitness identification experiments show that the elapsed time between witnessing an event and later identification accuracy is negatively correlated with accurate identifications and positively correlated with mistaken identifications (see Cutler and Penrod 1995; Shapiro and Penrod 1986). But this is one area that has not received a great deal of attention by eyewitness scientists. Most of the studies reviewed tended to compare identification performance after seconds or minutes with an hour or a day. There are little data on what happens after months or even weeks. Those in the legal system might think it curious that the passage of time has not been studied more by eyewitness identification researchers, but we suspect that there are two reasons for this. First, such studies are much more costly than the typical eyewitness identification experiment because they require relocating and retesting participant-witnesses months later. Second, we suspect that eyewitness identification researchers find the passage of time to be a relatively uninteresting variable because we obviously know the direction of the effect (memory does not get better with time). Accordingly, eyewitness researchers have generally been more interested in studying the effects of events that witnesses experience during the passage of time rather than the passage of time by itself. The important work of Elizabeth Loftus (1979), and the numerous researchers who have followed her lead in the study of post-event influences on memory, exemplifies this emphasis on studying the effects of events that occur during the memory retention interval.

Post-event influence refers to the fact that eyewitnesses' recollections of an event can be affected by "information" acquired well after the witnessing event has occurred. For example, after witnessing a clean-shaven person commit an act, participant-witnesses who were given information suggesting that he had a moustache incorporated that information into their later descriptions of the person (Loftus and Greene 1980). People will even extract information from questions in ways that change their later testimony. For instance, after viewing a car-pedestrian accident, people who were asked "Did another car pass the red Datsun while it was stopped at the stop sign?" were later much more likely to report that they saw a stop sign than were those not asked that question, even though it was a yield sign (Loftus et al. 1978). The point of post-event influence as it relates to the time interval between the witnessed event and the identification is that greater amounts of time permit greater opportunity for post-event influences to affect memory: Detectives can inadvertently insert information into their questions, witnesses can have their memory contaminated by other witnesses, witnesses can glean "facts" from newspaper stories about the crime, and so on. Hence, it is not just forgetting that is a problem with the passage of time, it is also the fact that time passage permits events that can create changes in how the witness remembers the original event. Later, witnesses cannot effectively parse what they actually saw from what they might have acquired later.

Finally, it should be noted that there is an interaction between the passage of time and susceptibility to post-event influences. The longer the time between the witnessed event and the introduction of misleading post-event information, the greater the effect of the misleading information on witness's subsequent reports (Loftus et al. 1978).

The *Manson* Test in Light of the Science

Suggestive Procedures

The science clearly supports the Court's concern about the use of suggestive identification procedures. Mistaken identifications are readily obtained by procedures suggesting that the culprit is in the lineup (or failing to warn that he might not be), exposing the witness to an innocent person's image and later conducting an identification test with that person, and/or using fillers in lineups who fail to fit the description of the culprit. If eyewitness science and the courts have a difference of opinion about these suggestive procedures, it is probably in the effect-permanence of suggestive procedures. Specifically, courts seem to assume that a mistaken identification resulting from a suggestive procedure can somehow be corrected later by using a fair procedure. Even Justice Marshall, in his dissenting opinion in *Manson*, made a claim that strikes eyewitness scientists as implausible. Marshall stated:

> Identification evidence ... can by its very nature be readily and effectively reproduced... when a prosecuting attorney learns that there has been a suggestive confrontation, he can easily arrange another lineup conducted under scrupulously fair conditions. Since the same factors are evaluated in applying both the Court's totality test and the *Wade-Simmons* independent-source inquiry, any identification which is "reliable" under the Court's test will support admission of evidence concerning such a fairly conducted lineup. The evidence of an additional, properly conducted confrontation will be more persuasive to a jury,

> thereby increasing the chance of a justified conviction where a reliable identification was tainted by a suggestive confrontation. At the same time, however, the effect of an unnecessarily suggestive identification – which has no value whatsoever in the law enforcement process – will be completely eliminated (p. 128).

Eyewitness scientists, on the other hand, do not generally accept the idea that a mistaken identification, whether it arises from a suggestive procedure or not, can somehow be "erased" or corrected by a subsequent identification test, no matter how "fair" that subsequent test might be. This difference of view goes to the very heart of the Court's conception of an "irreparable" error and accounts for why the Court would permit an in-court identification even if the suggestive out-of-court identification was suppressed. Eyewitness scientists generally believe that a mistaken identification taints the witness' memory toward the identified person. There remains some debate as to precisely how this tainting occurs. For example, does a mistaken identification result in the identified person's image *replacing* the witness's memory of the actual culprit, or does it result in the formation of a *second* image that competes with the original memory, or does it result in a *blended* image that has features of the culprit plus features of the identified person? In any case, the initial mistaken identification is almost certain to be repeated in a second identification task.

The other way that psychological science might differ somewhat from the Court's view of suggestive procedures is that psychological scientists have tended to construe of suggestive procedures somewhat more broadly than have the courts. The best example of this is the relatively recent but extensive work on the post-identification feedback. Whereas courts have shown concern with what the lineup administrator or others might say to the eyewitness immediately *before or during* the identification procedure, there has been almost no concern with what the lineup administrator might say to the eyewitness immediately *after* the witness makes a lineup choice. In effect, courts have tended to focus almost exclusively on suggestive aspects of the identification that might account for which person the eyewitness chose without a comparable concern for how the certainty of the eyewitness might have been manufactured by reactions from the lineup administrator ("Good, you got him!"). The certainty-inflating properties of this type of post-identification feedback can transform what might have been construed as no identification at all ("It might be number three, but I cannot say for sure") to a robust positive identification ("There is no doubt in my mind").

The DNA exoneration case of Ronald Cotton illustrates both the permanency of the mistake and the certainty inflation that comes from post-identification feedback. Jennifer Thompson was sexually assaulted and identified Ronald Cotton from a photo lineup as being her attacker. At trial, she was positive in her identification of Cotton and gave profoundly convincing testimony about her view, the attention she paid to the physical characteristics of her attacker, and recounted her description that fit Cotton. However, it was not Ronald Cotton who sexually assaulted Jennifer Thompson, it was Bobby Poole. Cotton served 10½ years in prison before DNA exonerated Cotton. The DNA test also definitively implicated Poole. Interestingly, however, after Cotton's conviction and before DNA testing there were credible suspicions that Poole was her attacker. Hence, a court-coordinated event was staged in which Poole was brought to the courtroom for Thompson to view and she was asked if Poole looked familiar to her. Thompson readily rejected Poole and indicated that she had never before seen the man. Even after DNA had exonerated Cotton and Thompson herself had accepted the fact that Poole was her attacker, she had no memory of Poole's face and, when thinking back to the attack she says, "I still see Ronald Cotton." (see http://www.pbs.org/wgbh/pages/frontline/shows/dna/interviews/thompson.html). Why was Thompson so certain? According to Thompson, "When I picked him out in the physical lineup and I walked out of the room, they looked at me and said, 'That's the same guy,' I mean, 'That's the one you picked out in the photo.' For me that was a huge amount of relief." Why would Thompson be relieved if she had the certainty she came to express in her testimony, at the time she experienced the lineup identification? The post-identification feedback effect seems to be the explanation here. Had she been required to state her certainty at the time of the identification, prior to the confirmatory statement, it might have been clear that she was not certain. The point here is that suggestive procedures do not just happen during the identification procedure; they can also happen after the identification. And, suggestiveness effects are not restricted to explaining just the identification itself; suggestive procedures also can account for false certainty.

The Problem of Hidden Suggestiveness

One of the biggest problems in evaluating the suggestiveness of eyewitness identification procedures is that it is difficult and sometimes nearly impossible to establish that some forms of suggestive procedure occurred in the first place. The suggestive use of poor lineup fillers is readily discoverable (because a photo of the lineup or the photos used in a photo-lineup must be shown to the court) but many other forms of suggestiveness are not so readily discoverable. Here, we have a particular concern about ephemeral events, such as verbal and nonverbal "hints" from the lineup administrator, selective reinforcement of witness responses to various lineup members, failure to instruct the eyewitness orally that the culprit might not be

present, and other important suggestive matters that, unlike the photos themselves, have no visual record. Compounding the problem is the fact that the right to the presence of counsel at the identification is applicable only to live lineups that occur after judicial proceedings have commenced. More important for the current point is that the right to presence of counsel is never applicable to photo-arrays (U.S. v. Ash 1973).[6] Because most initial identifications of criminal suspects are done with photographs (and a large percentage of jurisdictions in the U.S. use only photographs and never use live lineups), the discovery of any ephemeral suggestive events that were embedded in the photographic lineup remains almost entirely dependent on the testimony of the case detective and the witness. Often, it is unclear that the witness and the detective who administered the photographic lineup are properly motivated to report suggestiveness. But, even if the witness and detective are motivated to report any suggestiveness, they would have had to explicitly notice its significance at the time, interpret it as a suggestive event, remember it for the weeks or sometimes months that pass before being questioned, and then articulate it to the questioning party. The scientific psychology literature is replete with evidence supporting the conclusion that people are poor at being able to accurately report on the variables that influence their responses (e.g., Nisbett and Wilson 1977) and generally think that their actions are self-directed (e.g., Wegner 2002). The general point is that there are very good reasons to believe that the actual prevalence of suggestiveness in eyewitness identification procedures greatly exceeds the ability of defense counsel to prove it.

The Second Inquiry: The Reliability Test of Manson

Perhaps the most serious discrepancy between eyewitness science and *Manson* is evident in the second inquiry, which comes into play when an identification procedure is found to be suggestive. The *Manson* criteria (view, attention, certainty, time, description) were meant to clarify the idea that the ultimate issue is the reliability of the identification, not suggestiveness per se. Reasonable people can disagree, but we believe that the Court's general conceptualization was appropriate and defensible. [Recall our earlier example of an abduction for which repeated views and attention are perhaps so extreme that a suggestive identification procedure is not a likely issue.] Hence, in theory we see no reason why a set of criteria could not be justifiably used to trump concerns about a suggestive identification procedure if memory is very strong and suggestiveness somewhat weak. The problem is that almost no cases are this clear. Consider, for instance, Justice Marshall's accounting of Glover's view and attention that the majority of the Court nevertheless found sufficient to trump the suggestiveness of the single-photo identification procedure. In fact, federal courts under the logic of *Manson* have applied the *Manson* reliability test to dismiss profoundly suggestive identifications when the eyewitness observed the gunman's face for 2 or 3 s from underneath a table and was not certain in her identification until she was heavily coached and told by detectives that she had the right man (*United States v. Wong* 1994). Even for identifications that occurred months later and were based on viewings that lasted only seconds, highly suggestive procedures have been found acceptable based on the application of *Manson* reliability factors (e.g., *State v. Johnson* 2005).

Although we do not take issue with the broad assumption of the *Manson* Court that some set of reliability factors might justifiably trump concerns about suggestiveness in a given case, the science on the five factors in *Manson* points to very serious problems. First, none of the five criteria are unequivocally related to the accuracy of identifications. But, the most serious problem is that three of the five criteria (certainty, view, and attention) are self-reports by the eyewitnesses and these self-reports are themselves products of suggestive procedures.

The failure of the three self-reported *Manson* criteria to be independent of the suggestive procedure creates an "ironic test" in the second inquiry. Figure 1 depicts the nature of the irony. In the top panel of Fig. 1 is the "ideal" of *Manson*. In this ideal, the suggestive procedure only has a chance to affect the witness' identification decision. The *Manson* reliability test is used to see if factors such as view, attention, and certainty are strong enough to be unconcerned about the suggestiveness. The presumption in the ideal is that these self-report *Manson* factors are pristine reports. The bottom panel represents the reality of *Manson*. The reality of *Manson* is that the suggestive procedure can affect not only the identification decision, but also affect the witness' self-reports on the *Manson* factors. This strikes us as an ironic test because these

[6] From a constitutional law perspective, the right to the presence of counsel for live lineups but not for photographic lineups makes sense. Unlike a live lineup, the defendant himself is not present at a photographic lineup and, hence, he cannot assert a need for counsel's assistance on constitutional grounds. Furthermore, from a practical perspective, it would be difficult and burdensome to permit counsel at photographic lineups for several reasons, including: the suspect in a photo lineup is not likely to have a lawyer, police might not know how to contact the suspect as he might be at large, commonly the suspect has not been charged, and photo lineups often take place in the field (e.g., witness' home or place of business) on short notice. The fact that there is no constitutional right to legal counsel at photo lineups and the fact that practical problems largely prevent having defense counsel at photo lineups nevertheless do not make suggestive photo lineup procedures any less powerful or problematic. Hence, the urging by psychological scientists that photo lineups be administered using the double-blind procedure seems to be a logical solution to one of the more vexing problems in eyewitness identification evidence collection (Wells 1988; Wells et al. 1998).

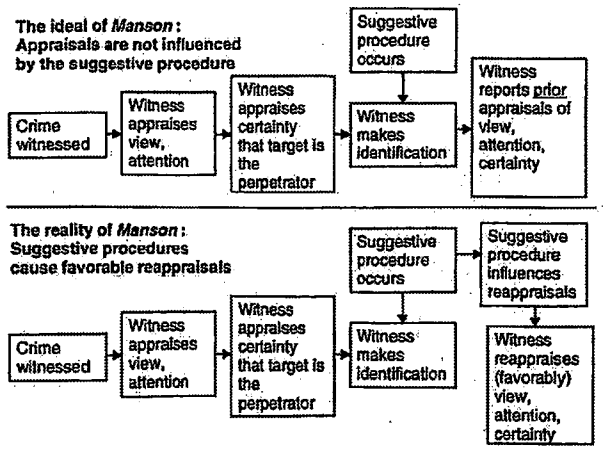


Fig. 1 The irony of Manson: suggestive procedures, which could cause a mistaken identification, also cause inflated standing on Manson factors, which leads to a conclusion that suggestive procedures are outweighed by good standing on Manson factors

Manson reliability factors come into consideration by courts under precisely the circumstances in which they are least likely to be indicators of reliability due to their having been distorted by the suggestive procedure itself.

Another way to describe this is to say that the three self-report *Manson* criteria can be mere indicators of the power of the suggestive procedure rather than indicators of the notion that the suggestive procedure was not a problem in this instance. Moreover, careful questioning at the *Manson* hearing is not likely to get around this problem. After making mistaken identifications and receiving confirming feedback, experimental witnesses were asked if the feedback affected how they answered questions about their certainty, view, and attention (Wells and Bradfield 1998). Most denied that it had any effect even though they were just as affected as the minority who admitted that it might have had an effect.

Deterrence Implications

The *Manson* Court was justifiably concerned with the question of whether application of the *Manson* test would effectively deter police from using suggestive procedures. The majority, although acknowledging that the per se approach had the stronger deterrent effect, nevertheless concluded that the totality approach contained in *Manson* would serve the deterrent function:

> Although the *per se* approach has the more significant deterrent effect, the totality approach also has an influence on police behavior. The police will guard against unnecessarily suggestive procedures under the totality rule, as well as the per se one, for fear that their actions will lead to the exclusion of identifications as unreliable (p. 113).

Justice Marshall did not directly argue that the *Manson* approach would be an ineffective deterrent, instead noting his clear preference for the deterrent effect of the per se exclusion rule:

> Deterrence of police use of unnecessarily suggestive identification procedures favors the *per se* rule. Indeed, it does so heavily; for such a rule would make it unquestionably clear to the police they must never use a suggestive procedure when a fairer alternative is available. I have no doubt that conduct would quickly conform to the rule (p. 126).

The science we have reviewed here is relevant to the issue of deterrence. For deterrence to work, the use of a suggestive procedure must lower the chances that the witness will receive a passing score in the second inquiry of *Manson*. But, as we have seen, the suggestive procedure actually raises the scores of the witness in the second inquiry of *Manson*. As a result, there is almost no threat of exclusion resulting from the use of suggestive procedures. In other words, the inflated certainty, statement of view, and statement of attention resulting from suggestive procedures effectively guards against exclusion, thereby undermining incentives to avoid suggestive procedures.

We believe a case can be made that the *Manson* approach not only undermines incentives to avoid suggestive procedures but also provides an incentive to use suggestive procedures. As any police officer knows, the ideal witness for purposes of obtaining a prosecution is one who is certain and who describes the witnessing conditions in a favorable light. If the *Manson* hearing is not going to result in the exclusion of the identification anyway, then why not use suggestive procedures to make sure that the witness not only picks the suspect but also expresses high certainty, reports an exaggeratedly good view, and claims to have paid close attention? We recognize that this analysis might appear cynical or accusatory. We do not intend it to be so. Police are just people and people respond to contingencies and incentives, often without an explicit awareness of what they are doing or why they are doing it. A justice motive, resulting from a belief that they have the right person and need to help the witness along, might very well be behind the continued prevalence of suggestive procedures. But, as long as the *Manson* test continues to be applied the way it is today, there is no reason to expect the contingencies and incentives themselves to somehow reduce the use of suggestive identification procedures.

Problems in the Application of Manson

Although the logic of *Manson* is flawed because of the ways that suggestive procedures affect three of the five *Manson* criteria, the problem is often compounded in the

ways that lower courts apply the criteria. Consider, for instance the certainty criterion. We find it very interesting that *Manson* (and its predecessor *Biggers*) clearly stated that the certainty criterion referred to the "certainty demonstrated at the confrontation." The key phrase here is "at the confrontation," by which the court presumably meant *at the time of identification*. It is unclear to us whether the Court was prescient on this point or was simply turning a phrase, but we prefer to believe that the Court understood that the certainty expressed by the witness has some diagnostic properties *at the time of identification* and that expressions of certainty later (e.g., after learning reactions of the lineup administrators) might be indicators of something other than the reliability of the witness' memory. This is precisely what eyewitness scientists have discovered, as we noted in an earlier section of this article. Given no feedback at all, a witness' expression of certainty at the moment of the identification is in fact correlated (albeit imperfectly) with the accuracy of the identification. But, later expressions of certainty are the product of numerous non-memorial sources, such as the witness' beliefs about other evidence against the accused or their beliefs about what others believe. And yet, during a *Manson* hearing, judges often accept the witness' current certainty statement or the witness' retrospections about how certain they recall being when they made their identification. Eyewitness science has shown how these retrospections are distorted by "information" that the witness picks up after the identification, but courts treat them as though they were pristine indicators of the level of uncertainty that the eyewitness had at the time of identification. In some jurisdictions, police will not collect a certainty statement at the time of identification if the witness seems uncertain because they know that the witness will become more certain at a later point in time, especially after they have been reassured that they identified the "right" guy. As a result, the courts are robbed of any reliable record of uncertainty that the witness might have had "at the time of the confrontation." Hence, in this respect, the *Manson* criteria themselves are better than the way they are often applied.

A related problem often occurs with descriptions. It seems to us that the Court clearly intended that the prior description of the criminal be exactly that: a *prior* description. And yet, courts sometimes permit the use of descriptions given after the identification or after having viewed the defendant in court. Not surprisingly, later descriptions tend to become more detailed and become more consistent with the identified person. It is difficult to keep these post-computed descriptions out when the witness says, "I had forgotten about the scar...but as I thought about it further and cast my mind back..." It might be difficult to keep the eyewitness from giving this "new" description at trial, but in a pre-trial *Manson* hearing the description could easily be restricted to what the witness described *before* seeing the suspect in a lineup.

Another problem with how the *Manson* criteria are actually used is that some criteria are relegated to a "nevertheless" status as long as the witness looks strong on some other criterion. In general, it appears that any of the criteria can be low and yet the witness passes the reliability test as long as the witness is certain. Consider the time-since-witnessing factor. *Biggers* was identified 7 months after the crime, *nevertheless* the witness was certain, and hence the identification was permitted. Consider the view factor. In a 1997 case, a man was convicted of murder based on the highly certain identification testimony of someone who was 450 feet away, which exceeds the capability of the human visual system (Loftus and Harley 2005). Consider the attention factor. In *State v. Ledbetter* (1981) the court said that even a "fleeting glance" might be sufficient and noted the high level of certainty of the witness to justify admission of the identification. If there is no level of attention, view, or passage of time that is so poor that the identification is excluded (as long as the witness is certain), then perhaps the criteria are just too flexible to be meaningful. It raises the serious question of whether the *Manson* criteria are too easily applied in an outcome-oriented manner in which the desired outcome (I want to admit this evidence) can be achieved in virtually every instance.

Alternatives to *Manson*

The primary purpose of this article is to articulate the problem in *Manson* and stimulate a dialog rather than propose a specific solution. And, it would be foolish to believe that there is a solution that will prevent all wrongful eyewitness-based convictions and still serve well the interests of convicting the guilty. Nevertheless, *Manson* is flawed and it is not at all foolish to think that we could do better.

In fact, whereas the U.S. Supreme Court has said nothing about eyewitness identification issues since the *Manson* decision in 1977, some state courts have recognized that *Manson* is simply not satisfactory for their jurisdictions. Kansas (*State v. Hunt* 2003) and Utah (*State v. Ramirez* 1991) have refined the *Manson* test to use criteria they think are more in line with the social science literature. New York (*Commonwealth v. Johnson* 1995) and Massachusetts (*People v. Adams* 1981) require automatic suppression of unnecessarily suggestive procedures. Wisconsin (*State v. Dubose* 2005) requires suppression of show-ups unless it was necessary under the circumstances. Connecticut (*State v. Ledbetter* 2005) now mandates a jury instruction if police failed to give the "might or might not

be present" pre-lineup instruction to the eyewitness. The Georgia Supreme Court has now directed trial courts to cease instructing jurors to consider the eyewitness' confidence in evaluating the testimony (Brodes v. State 2005). These are all, in their own ways, well-reasoned repudiations of at least some aspects of *Manson*.

United States Attorney General Janet Reno took careful note of the DNA exonerations that first began to unfold during her tenure in the 1990s. Reno recognized that existing safeguards (that include *Manson*) have failed to prevent convictions of the innocent and, importantly, that more than three-quarters of these exonerations are cases of mistaken identification. Accordingly, she convened eyewitness experts, law enforcement officers, and prosecutors to develop a set of guidelines for law enforcement intended to avoid suggestive eyewitness identification procedures. The result, *Eyewitness Evidence: A Guide for Law Enforcement*, was published in 1999 and distributed to every law enforcement agency in the United States. Although the Guide has good procedural recommendations for how to conduct non-suggestive identification procedures, it has no force of law behind it. And, given the incentives for continuing to use suggestive procedures (suggestive procedures make it more likely that the witness will make an identification and suggestive procedures bolster witness certainty) plus the absence of incentives to avoid suggestive procedures (an identification obtained with a suggestive procedure will virtually always pass the *Manson* test), there is little reason for police to actually follow the Guide. In effect, *Manson* tends to stand in the way of progress toward eliminating suggestive eyewitness identifications. In light of the social science, which has demonstrated the power of suggestive procedures and articulated ways to avoid suggestiveness, as well as the prevalence of DNA exonerations, which are predominantly cases of mistaken identification, it is time for the Court to consider alternatives to *Manson*.

Alternatives to *Manson* should have several characteristics that are absent in *Manson*. First, unlike *Manson*, they must provide an incentive to avoid suggestive procedures and never reward suggestive ones. This means that there has to be some real threat of suppression or some other cost to the government when unnecessarily suggestive procedures are used. Second, alternatives to *Manson* must recognize that suggestive procedures, whether unnecessary or not, confound the fact-finding process and require a much deeper analysis than the check-listing heuristic that characterizes *Manson*. Third, whatever the criteria for deciding to admit a suggestive identification, those criteria need to be independent of the suggestive procedure itself, which means that self-reports of the eyewitness are not likely to ever be good criteria unless it can be shown that they were assessed prior to the suggestive event.

Per se Exclusion?

Clearly, one approach would be a return to the per se exclusion idea in which unnecessarily suggestive procedures result in exclusion without consideration of the notion that the identification might nevertheless be reliable. In fact, however, it is unclear that this type of per se exclusion was ever endorsed by the Court. Although the Court's 1967 Wade trilogy (*United States v. Wade* 1967; *Gilbert v. California* 1967; *Stovall v. Denno* 1967) seemed to endorse a per se exclusion notion, the Court made it clear the following year that the over-riding issue was whether it was likely that the eyewitness misidentified the suspect (*Simmons v. United States* 1968). Hence, the idea that reliability (rather than suggestiveness) is the ultimate issue was in place even before *Biggers* and *Manson*.

The great advantage of some version of per se exclusion is that it would largely jettison unnecessarily suggestive practices. It has become increasingly clear that police take directions from prosecutors on eyewitness identification procedural issues because it is the prosecutors who have to make the evidence work in court (Wells et al. 2000). A prosecutor who experiences an exclusion based on unnecessarily suggestive procedures is likely to pressure police to make systemic reforms. In fact, there are now well-articulated systems for eyewitness identification procedures based on the available science, including a guide from the National Institute of Justice (Technical Working Group for Eyewitness Evidence 1999), and these are readily adaptable to individual jurisdictions across the county. Given what is known today and the development of workable systems to prevent suggestive procedures, it is unclear why unnecessarily suggestive procedures persist except for the fact that *Manson* has not created the proper incentives.

Despite the strong incentive to clean up suggestive procedures inherent in a per se exclusion approach, there are two primary reasons to not favor a hard and fast per se exclusion approach. First, witnessing conditions can exist that would make the use of a suggestive procedure a moot consideration because the strength of the witness' memory would outweigh the suggestiveness factors (recall our abduction example). Clearly, per se exclusion in this particular situation would result in a guilty person going free. Second, even if a per se exclusion approach were adopted, it would apply only to cases in which the procedure was *unnecessarily* suggestive. But, from a scientific perspective, whether the suggestive procedure was necessary or not necessary has no bearing at all on the power of the suggestive procedure to induce mistaken identifications. Accordingly, the fact that a lineup was not possible and, therefore, a show-up was necessary (*Stovall v. Denno* 1967) does not make the show-up any less powerfully suggestive. What is needed is an approach that helps

protect against mistaken identification regardless of whether the suggestive procedure was necessary or not.

Shift of Burden with Special Onus in the Context of Suggestive Procedures?

The current approach in *Manson* is one in which the defense must request a hearing on the identification and attempt to show that the identification was not reliable. The burden clearly rests with the defense to show that the identification was not reliable and failure to do so results in admission of the identification evidence. But, it is unclear why the burden rests with the defense to show unreliability rather than with the prosecution to show reliability. It is unlikely that a shift in burden would matter much to the prosecution, of course, as long as the prosecution was able to continue to use the current *Manson* criteria in the context of trumping suggestive procedures.

Under the shift-of-burden notion, the prosecution would have to make the case that the identification was reliable regardless of whether a suggestive procedure was necessary or unnecessary. The irrelevance of the "necessity" aspect of suggestive procedures seems to us to comport better with the Court's own reasoning on these matters that "reliability is the linchpin in determining the admissibility of identification testimony" along with our observation that the power of suggestive procedures is not moderated by whether the suggestiveness was necessary.

In the context of a suggestive procedure, the prosecution would not be able to make the case for reliability based on certainty, view, or attention statements of the witness unless it could be demonstrably shown that these self-reports were reliable. This means that the onus would be on the prosecution to find evidence of reliability that is independent of the suggestive procedure.

This disallowance of witness self-reports would likely permit many highly suggestive identifications, such as our hypothetical of the abducted person, because the case for a reliable memory can clearly be established through known facts (e.g., the abducted witness clearly had long and repeated view of the culprit). However, due to the presence of suggestive procedures and the absence of such obviously reliable circumstances, the onus on the prosecution would be significantly greater than currently exists. One of the effects is likely to be to pressure police to collect statements from witnesses regarding their viewing conditions and attention early in the investigation, prior to the possibility of suggestive influences, a good practice that too often does not occur. Prosecutors can then use these statements to support the reliability claim even if there is a later suggestive procedure because the statements were obtained prior to the suggestive event. Notice as well the deterrent properties of this approach because the ability to use certainty, view, and attention statements (or other self-reports by the eyewitness) to show reliability are precluded when they are obtained subsequent to a suggestive procedure. The result would be a diminution of suggestive eyewitness identification procedures in the U.S. criminal justice system.

Limits to Testimony

Another approach would be to consider limits to the testimony of the eyewitness in cases where outright exclusion is too extreme of a remedy. Suppose, for instance, that the eyewitness received confirming feedback at the lineup and the certainty statement was taken *after* the feedback. A judge might rule that the witness could testify about the identification, but could not testify about his or her certainty. Likewise, suppose that an eyewitness gave a vague pre-lineup description of the culprit but began to give descriptions that are more detailed after the identification. A judge could rule that the witness can testify as to the pre-lineup description but not the post-lineup description. Alternatively, suppose that a witness made a tentative identification and then was shown a second lineup in which the only person in common was the defendant and positively identified him. A judge could rule that testimony regarding the initial tentative identification could be used at trial, but the second (more certain) identification could not become part of the testimony. Every case would be a different set of facts, but the point is that total exclusion is not the only option in some cases.

Jury Instructions

Another alternative to exclusion is for the judge to instruct the jury that the presence of a suggestive identification procedure lessens the reliability of the identification testimony and this can be legitimately considered in assessing the reliability of that testimony. Although defense attorneys can always make their own arguments to the jury regarding suggestive identification procedures, defense arguments ring hollow in juries' ears and appear as mere ploys. The jury instruction alternative to *Manson* that is envisioned here is quite different from the *Telfaire* instruction (*U.S. v. Telfaire,* 1979). In mock jury studies, eyewitness scientists have not found the *Telfaire* instruction to be an effective safeguard (see Chapter 17 of Cutler and Penrod 1995). But, *Telfaire* itself is based on the *Manson* factors. Furthermore, the *Telfaire* approach assumes that there is some generic set of statements that can be given to a jury in any eyewitness identification case (i.e., not in any way tailored to the specific case). The jury instruction alternative we are discussing here is one in which the instruction is tailored to the specifics of the case. So, for instance, if the court found

that a particular feature of the identification procedure was suggestive, the jury would be told about the suggestive feature and instructed that the suggestive feature can be considered in evaluating the likely accuracy of the eyewitness. If post-identification feedback was given to the eyewitness before securing a certainty statement, for instance, the jury might be instructed "Research has shown that suggestions to an eyewitness that they identified the 'right' person can lead them to recall that they were certain all along even if they were not. You can consider this as a possible factor in deciding whether the witness really was certain when she made her identification." Whether jury instructions of this sort will have much impact on the jury is an open question, but it is likely to serve a deterrent function because prosecutors, who are motivated to keep such instructions away from the jury, will likely help bring pressure back on their police departments to avoid suggestive procedures in the future.

Final Remarks about Alternatives to Manson

The *Manson* approach is predicated on the concept of *postdiction*.[7] Postdicting eyewitness identification accuracy has proven to be extremely difficult and precarious (see review by Caputo and Dunning 2006). Perhaps the most promising of the postdictors is decision time. Research consistently shows that accurate identifications from lineups are made faster than are mistaken identifications (e.g., Dunning and Perretta 2002; Dunning and Stern 1994; Smith et al. 2000; Sporer 1993; Stern and Dunning 1994; Weber et al. 2004). Note that this decision time refers to situations in which the witness is unaware that time is being measured and it refers to actual time, not self-reports by the eyewitness. Because these decision times are not self-reports, they avoid many of the problems that we have discussed about certainty, attention, and view. Of course, such data are not being collected in actual cases and this would require the use of new equipment and controlled environments. Furthermore, the relation between decision time and accuracy is not as useful as it might first appear because what constitutes a short time and a long time depends on numerous variables, including the presence or absence of suggestive procedures themselves (Weber et al. 2004).

In casting the forgoing paragraph, we were struck by our own observation that the measurement of decision time would require police to acquire and implement new equipment that would measure decision time. This sets up our final observation about alternatives to *Manson*. Why do we not simply take the extra care needed to jettison unnecessarily suggestive procedures in the first place? We have provided a partial answer to this question when we analyzed the deterrent function of *Manson* and concluded that its deterrent value was largely absent (because the reliability factors routinely trump suggestiveness), and in fact the incentives for police and prosecutors might actually favor the maintenance of suggestive procedures (because they yield more identifications of the suspect and higher levels of certainty). But, serious questions need to be raised about why the courts are being so passive and accommodating in continually being asked to make rulings on unnecessarily suggestive procedures with these *Manson* hearings. Why are courts so tolerant of unnecessarily suggestive procedures that raise the chances of mistaken identification, waste the time of the court, and intrude on everyone's sense of a fair identification procedure? Today, police carry out very complex evidence collection procedures with physical evidence such as blood, hair, and fiber that have to conform to precise protocols and careful documentation. Clearly, police would be capable of carrying out careful non-suggestive protocols with eyewitness identification evidence as well if courts were more assertive in demanding it.

Concluding Comments

Manson was a reasonable proposition in 1977, but we know much more today. *Manson* lacks the architecture to serve two functions intended by the court, namely the safeguard against wrongful convictions function and the incentive to avoid suggestive procedures function. Both biological science (via DNA) and social science (via eyewitness identification experiments) have shed new light on the eyewitness identification errors and have revealed these errors to be much more prevalent than the 1977 Court could have surmised. Now, 30 years later, we are all wiser. In a joint effort between social science and the law, we should be able to create a system that provides stronger incentives to eliminate unnecessarily suggestive procedures without excluding reliable identifications. We now know that the *Manson* approach is not such a system.

[7] Postdiction is a term that psychological scientists have used to refer to "backward predictions" in which some set of facts currently available is used to estimate the chances that something happened in the past. Scientific experiments are perfectly suited for the establishment of cause-effect relations but generally ill-suited for real-world postdiction because these postdictions require knowledge of base rate statistics and multi-colinearities that are unknown and, in many cases, unknowable (Seelau and Wells 1995).

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2206

Identifying the Culprit



Assessing Eyewitness Identification

Committee on Scientific Approaches to Understanding and Maximizing
the Validity and Reliability of Eyewitness Identification
in Law Enforcement and the Courts

Committee on Science, Technology, and Law

Policy and Global Affairs

Committee on Law and Justice

Division of Behavioral and Social Sciences and Education

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Preface

Eyewitness identifications play an important role in the investigation and prosecution of crimes, but they have also led to erroneous convictions. In the fall of 2013, the Laura and John Arnold Foundation called upon the National Academy of Sciences (NAS) to assess the state of research on eyewitness identification and, when appropriate, make recommendations. In response to this request, the NAS appointed an ad hoc study committee that we have been privileged to co-chair.

The committee's review analyzed relevant published and unpublished research, external submissions, and presentations made by various experts and interested parties. The research examined fell into two general categories: (1) basic research on vision and memory and (2) applied research directed at the specific problem of eyewitness identification.

Basic research has progressed for many decades, is of high quality, and is largely definitive. Research of this category identifies principled and insurmountable limits of vision and memory that inevitably affect eyewitness accounts, bear on conclusions regarding accuracy, and provide a broad foundation for the committee's recommendations.

Through its review, the committee came to recognize that applied eyewitness identification research has identified key variables affecting the accuracy of eyewitness identifications. This research has been instrumental in informing law enforcement, the bar, and the judiciary of the frailties of eyewitness identification testimony. Such past research has appropriately identified the variables that may affect an individual's ability to make an accurate identification. However, given the complex nature of eyewitness identification, the practical difficulties it poses for experimental research,

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Summary

Eyewitnesses play an important role in criminal cases when they can identify culprits.[1] Yet it is well known that eyewitnesses make mistakes and that their memories can be affected by various factors including the very law enforcement procedures designed to test their memories. For several decades, scientists have conducted research on the factors that affect the accuracy of eyewitness identification procedures. Basic research on the processes that underlie human visual perception and memory have given us an increasingly clear picture of how eyewitness identifications are made and, more important, an improved understanding of the principled limits on vision and memory that may lead to failures of identification. Basic research has been complemented by a growing body of applied research on eyewitness identification, which has examined those variables that particularly affect eyewitnesses to crimes: *system variables* (conditions such as the procedures followed to obtain identifications that can be controlled by law enforcement) and *estimator variables* (conditions associated with the actual crime, such as viewing conditions, or factors specific to the eyewitness, such as the race of the victim relative to that of the perpetrator, that cannot be controlled by law enforcement).

Through such scientific research, we have learned that many factors influence the visual perceptual experience: dim illumination and brief viewing times, large viewing distances, duress, elevated emotions, and the presence of a visually distracting element such as a gun or a knife. Gaps in sensory

[1]Throughout this report, the term *identification* denotes person recognition. *Eyewitness identification* refers to recognition by a witness to a crime of a culprit unknown to the witness.

input are filled by expectations that are based on prior experiences with the world. Prior experiences are capable of biasing the visual perceptual experience and reinforcing an individual's conception of what was seen. We also have learned that these qualified perceptual experiences are stored by a system of memory that is highly malleable and continuously evolving, neither retaining nor divulging content in an informational vacuum. The fidelity of our memories to actual events may be compromised by many factors at all stages of processing, from encoding to storage to retrieval. Unknown to the individual, memories are forgotten, reconstructed, updated, and distorted. Therefore, caution must be exercised when utilizing eyewitness procedures and when relying on eyewitness identifications in a judicial context.

In 2013, the Laura and John Arnold Foundation called on the National Academy of Sciences (NAS) to appoint an ad hoc study committee to:

1. critically assess the existing body of scientific research as it relates to eyewitness identification;
2. identify any gaps in the existing body of literature and suggest appropriate research questions to pursue that will further our understanding of eyewitness identification and that might offer additional insight into law enforcement and courtroom practice;
3. provide an assessment of what can be learned from research fields outside of eyewitness identification;
4. offer recommendations for best practices in the handling of eyewitness identifications by law enforcement;
5. offer recommendations for developing jury instructions;
6. offer advice regarding the scope of a Phase II consideration of neuroscience research as well as any other areas of research that might have a bearing on eyewitness identification; and
7. write a consensus report with appropriate findings and recommendations.

The committee heard from numerous experts, practitioners, and stakeholders and reviewed relevant published and unpublished literature as well as submissions provided to the committee. In this report, the committee offers its findings and recommendations for:

- identifying and facilitating best practices in eyewitness procedures for the law enforcement community;
- strengthening the value of eyewitness identification evidence in court; and
- improving the scientific foundation underpinning eyewitness identification.

OVERARCHING FINDINGS

The committee is confident that the law enforcement community, while operating under considerable pressure and resource constraints, is working to improve the accuracy of eyewitness identifications. These efforts, however, have not been uniform and often fall short as a result of insufficient training, the absence of standard operating procedures, and the continuing presence of actions and statements at the crime scene and elsewhere that may intentionally or unintentionally influence eyewitness' identifications.

Basic scientific research on human visual perception and memory has provided an increasingly sophisticated understanding of how these systems work and how they place principled limits on the accuracy of eyewitness identification.[2] Basic research alone is insufficient for understanding conditions in the field, and thus has been augmented by studies applied to the specific practical problem of eyewitness identification. Applied research has identified key variables that affect the accuracy and reliability of eyewitness identifications and has been instrumental in informing law enforcement, the bar, and the judiciary of the frailties of eyewitness identification testimony.

A range of best practices has been validated by scientific methods and research and represents a starting place for efforts to improve eyewitness identification procedures. A number of law enforcement agencies have, in fact, adopted research-based best practices. This report makes actionable recommendations on, for example, the importance of adopting "blinded" eyewitness identification procedures. It further recommends that standardized and easily understood instructions be provided to eyewitnesses and calls for the careful documentation of eyewitness' confidence statements. Such improvements may be broadly implemented by law enforcement now. It is important to recognize, however, that, in certain cases, the state of scientific research on eyewitness identification is unsettled. For example, the relative superiority of competing identification procedures (i.e., simultaneous versus sequential lineups) is unresolved.

The field would benefit from collaborative research among scientists and law enforcement personnel in the identification and validation of new best practices that can improve eyewitness identification procedures. Such a foundation can be solidified through the use of more effective research designs (e.g., those that consider more than one variable at a time, and in

[2]Basic research on vision and memory seeks a comprehensive understanding of how these systems are organized and how they operate generally. The understanding derived from basic research includes principles that enable one to predict how a system (such as vision or memory) might behave under specific conditions (such as those associated with witnessing a crime) and to identify the conditions under which it will operate most effectively and those under which it will fail. Applied research, by contrast, empirically evaluates specific hypotheses about how a system will behave under a particular set of real-world conditions.

different study populations to ensure reproducibility and generalizability), more informative statistical measures and analyses (i.e., methods from statistical machine learning and signal detection theory to evaluate the performance of binary classification tasks), more probing analyses of research findings (such as analyses of consequences of data uncertainties), and more sophisticated systematic reviews and meta-analyses (that take account of current guidelines, including transparency and reproducibility of methods).

In view of the complexity of the effects of both system and estimator variables and their interactions on eyewitness identification accuracy, better experimental designs that incorporate selected combinations of these variables (e.g., presence or absence of a weapon, lighting conditions, etc.) will elucidate those variables with meaningful influence on eyewitness performance, which can, in turn, inform law enforcement practice of eyewitness identification procedures. To date, the eyewitness literature has evaluated procedures mostly in terms of a single diagnosticity ratio or an ROC (Receiver Operating Characteristic) curve; even if uncertainty is incorporated into the analysis, many other powerful tools for evaluating a "binary classifier" are available and worthy of consideration.[3] Finally, syntheses of eyewitness research has been limited to meta-analyses that have not been conducted in the context of systematic reviews. Systematic reviews of stronger research studies need to conform to current standards and be translated into terms that are useful for decision makers.

The committee here offers a summary of its key recommendations to strengthen the effectiveness of policies and procedures used to obtain accurate eyewitness identifications.

RECOMMENDATIONS TO ESTABLISH BEST PRACTICES FOR THE LAW ENFORCEMENT COMMUNITY

The committee's review of law enforcement practices and procedures, coupled with its consideration of the scientific literature, has identified a number of areas where eyewitness identification procedures could be strengthened. The practices and procedures considered here involve acquisition of data that reflect a witness' identification and the contextual factors that bear on that identification. A recurrent theme underlying the committee's recommendations is development of and adherence to guidelines that are consistent with scientific standards for data collection and reporting.

[3]T. Hastie, R. Tibshirani, and J. H. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction* (New York: Springer, 2009).

Recommendation #1: Train All Law Enforcement Officers in Eyewitness Identification

The committee recommends that all law enforcement agencies provide their officers and agents with training on vision and memory and the variables that affect them, on practices for minimizing contamination, and on effective eyewitness identification protocols.

Recommendation #2: Implement Double-Blind Lineup and Photo Array Procedures

The committee recommends blind (double-blind or blinded) administration of both photo arrays and live lineups and the adoption of clear, written policies and training on photo array and live lineup administration.

Recommendation #3: Develop and Use Standardized Witness Instructions

The committee recommends the development of a standard set of easily understood instructions to use when engaging a witness in an identification procedure.

Recommendation #4: Document Witness Confidence Judgments

The committee recommends that law enforcement document the witness' level of confidence verbatim at the time when she or he first identifies a suspect.

Recommendation #5: Videotape the Witness Identification Process

The committee recommends that the video recording of eyewitness identification procedures become standard practice.

RECOMMENDATIONS TO STRENGTHEN THE VALUE OF EYEWITNESS IDENTIFICATION EVIDENCE IN COURT

The best guidance for legal regulation of eyewitness identification evidence comes not from constitutional rulings, but from the careful use and understanding of scientific evidence to guide fact-finders and decision-makers. The *Manson v. Brathwaite* test under the Due Process Clause of the U.S. Constitution for assessing eyewitness identification evidence was established in 1977, before much applied research on eyewitness identification had been conducted. This test evaluates the "reliability" of eyewitness iden-

tifications using factors derived from prior rulings and not from empirically validated sources. As critics have pointed out, the *Manson v. Brathwaite* test includes factors that are not diagnostic of reliability. Moreover, the test treats factors such as the confidence of a witness as independent markers of reliability when, in fact, it is now well established that confidence judgments may vary over time and can be powerfully swayed by many factors. While some states have made minor changes to the due process framework, wholesale reconsideration of this framework is only a recent development.

Recommendation #6: Conduct Pretrial Judicial Inquiry

The committee recommends that, as appropriate, a judge make basic inquiries when eyewitness identification evidence is offered.

Recommendation #7: Make Juries Aware of Prior Identifications

The committee recommends that judges take all necessary steps to make juries aware of prior identifications, the manner and time frame in which they were conducted, and the confidence level expressed by the eyewitness at the time.

Recommendation #8: Use Scientific Framework Expert Testimony

The committee recommends that judges have the discretion to allow expert testimony on relevant precepts of eyewitness memory and identifications.

Recommendation #9: Use Jury Instructions as an Alternative Means to Convey Information

The committee recommends the use of clear and concise jury instructions as an alternative means of conveying information regarding the factors that the jury should consider.

RECOMMENDATIONS TO IMPROVE THE SCIENTIFIC FOUNDATION UNDERPINNING EYEWITNESS IDENTIFICATION RESEARCH

Basic scientific research on visual perception and memory provides important insight into the factors that can limit the fidelity of eyewitness identification. Research targeting the specific problem of eyewitness identification complements basic scientific research. However, this strong scientific foundation remains insufficient for understanding the strengths and

limitations of eyewitness identification procedures in the field. Many of the applied studies on key factors that directly affect eyewitness performance in the laboratory are not readily applicable to actual practice and policy. Applied research falls short because of a lack of reliable or standardized data from the field, a failure to include a range of practitioners in the establishment of research agendas, the use of disparate research methodologies, failure to use transparent and reproducible research procedures, and inadequate reporting of research data. The task of guiding eyewitness identification research toward the goal of evidence-based policy and practice will require collaboration in the setting of research agendas and agreement on methods for acquiring, handling, and sharing data.

Recommendation #10: Establish a National Research Initiative on Eyewitness Identification

The committee recommends the establishment of a National Research Initiative on Eyewitness Identification.

Recommendation #11: Conduct Additional Research on System and Estimator Variables

The committee recommends broad use of statistical tools that can render a discriminability measure to evaluate eyewitness performance and a rigorous exploration of methods that can lead to more conservative responding. The committee further recommends that caution and care be used when considering changes to any existing lineup procedure, until such time as there is clear evidence for the advantages of doing so.

CONCLUSION

Eyewitness identification can be a powerful tool. As this report indicates, however, the malleable nature of human visual perception, memory, and confidence; the imperfect ability to recognize individuals; and policies governing law enforcement procedures can result in mistaken identifications with significant consequences. New law enforcement training protocols, standardized procedures for administering lineups, improvements in the handling of eyewitness identification in court, and better data collection and research on eyewitness identification can improve the accuracy of eyewitness identifications.

1

Introduction

Accurate eyewitness identifications[1] may aid in the apprehension and prosecution of the perpetrators of crimes. However, inaccurate identifications may lead to the prosecution of innocent persons while the guilty party goes free. It is therefore crucial to develop eyewitness identification procedures that achieve maximum accuracy and reliability.

Eyewitness evidence is not infallible. In 1932, Yale University law professor Edwin M. Borchard documented nearly seventy cases of miscarriage of justice caused by eyewitness errors in his book, *Convicting the Innocent.*[2] Years later, in 1967, the U.S. Supreme Court highlighted the danger of erroneous eyewitness identification in *United States v. Wade,* stating, "The vagaries of eyewitness identification are well-known; the annals of criminal law are rife with instances of mistaken identification."[3]

The Federal Bureau of Investigation (FBI) estimates that U.S. law enforcement made 12,196,959 arrests in 2012. The FBI estimates that 521,196 of these arrests were for violent crimes.[4] Accurate data on the number of crimes observed by eyewitnesses are not available. If only a fraction of the violent crimes in the United States involve an eyewitness, the number must

[1]Throughout this report, the term *identification* denotes person recognition. *Eyewitness identification* refers to recognition by a witness to a crime of a culprit unknown to the witness.

[2]Edwin M. Borchard, *Convicting the Innocent: Sixty-Five Actual Errors of Criminal Justice* (New York: Garden City Publishing Company, Inc., 1932).

[3]*United States v. Wade,* 388 U.S. 230, 288 (1967).

[4]Federal Bureau of Investigation, "Crime in the United States 2012: Persons Arrested," available at: http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/persons-arrested/persons-arrested.

BOX 1-1
The Ronald Cotton Case*

In 1984, a college student named Jennifer Thompson was raped in her apartment in Burlington, North Carolina. The police asked her to help create a composite sketch of the rapist. The police then received a tip that a local man named Ronald Cotton resembled the composite, and shortly after the crime, Thompson was shown a photo array containing six photos. With some difficulty, she chose two pictures, one of which was of Cotton. Finally, she said, "I think this is the guy," pointing to Cotton. "You're sure," the lead detective asked, and she responded, "Positive." Thompson asked, "Did I do OK?" The detectives responded, "You did great." She has described how those encouraging remarks had the effect of making her more confident in her identification.

The police then showed Thompson a live lineup. Cotton was the only person repeated from the prior photo array. This would make Cotton more familiar and might suggest that he was the prime suspect. Nevertheless, Thompson remained hesitant and was having trouble deciding between two people. After several minutes, she told the police that Cotton "looks the most like him." The lead detective asked "if she was certain," and she said, "Yes." Again, the detectives further reinforced her decision. The lead detective told Thompson, "It's the same person you picked from the photos." She later described feeling a "huge amount of relief" when told that she had again picked the right person.

At Ronald Cotton's criminal trial, Thompson agreed she was "absolutely sure" that he was the rapist. Cotton was sentenced to life in prison plus 54 years. He served 10.5 years before DNA tests exonerated him and implicated another man, Bobby Poole. Not only did the identification procedures increase Thompson's confidence in the mistaken memory event, but they also resulted in her rejection of the actual culprit. Poole had been presented to Thompson at a post-trial hearing, and she could not recognize him. "I have never seen him in my life," she said at the time.

In response to this error, the lead detective in the case, Mike Gauldin, later as police chief, was the first in the state to institute a series of new practices, including double-blind lineup procedures. In the years that followed, North Carolina adopted such practices statewide. Ronald Cotton and Jennifer Thompson have since written a book, *Picking Cotton*, that describes their case and experiences.

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*See, generally, http://www.cbsnews.com/news/eyewitness-how-accurate-is-visual-memory/ and http://www.slate.com/articles/news_and_politics/jurisprudence/features/2011/getting_it_wrong_convicting_the_innocent/how_eyewitnesses_can_send_innocents_to_jail.html.

be sizable. One estimate based on a 1989 survey of prosecutors suggests that at least 80,000 eyewitnesses make identifications of suspects in criminal investigations each year.[5]

Recently, post-conviction DNA exonerations of innocent persons have dramatically highlighted the problems with eyewitness identifications.[6,7] In the United States, more than 300 exonerations have resulted from post-conviction DNA testing since 1989.[8] According to the Innocence Project, at least one mistaken eyewitness identification was present in almost three-quarters of DNA exonerations.[9] In many of these cases, eyewitness identification played a significant evidentiary role, and almost without exception, the eyewitnesses who testified expressed complete confidence that they had chosen the perpetrator. Many eyewitnesses testified with high confidence despite earlier expressions of uncertainty.[10] For example, in the well-known case of Ronald Cotton (see Box 1-1), Jennifer Thompson (the victim) has described how she was initially quite unsure of her eyewitness identification of Cotton, a man later exonerated by DNA testing. She became certain it was Cotton only after the police made confirmatory remarks and had her participate in two identification procedures where Cotton was the only person shown both times.

Erroneous eyewitness identifications can occur across the range of criminal convictions in which eyewitness evidence is presented, but most of these cases lack the biological material that can be tested for DNA and used for exoneration purposes. While eyewitness misidentifications may have been a dominant factor in some erroneous convictions, it is important to note that other factors, including errors at various stages of the legal and judicial processes, may have contributed to the erroneous convictions.

CHARGE TO THE COMMITTEE

In 2013, the Laura and John Arnold Foundation called on the National Research Council (NRC) to assess the state of scientific research on

[5]A. G. Goldstein, J. E. Chance, and G. R. Schneller, "Frequency of Eyewitness Identification in Criminal Cases: A Survey of Prosecutors," *Bulletin of the Psychonomic Society* 27(1): 71, 73 (January 1989).

[6]CNN, "Exonerated: Cases by the Numbers," December 4, 2013, available at: http://www.cnn.com/2013/12/04/justice/prisoner-exonerations-facts-innocence-project/.

[7]Taryn Simon, "Freedom Row," *New York Times Magazine*, January 26, 2003.

[8]The Innocence Project, "DNA Exoneree Case Profiles," available at: http://www.innocenceproject.org/know/.

[9]The Innocence Project, "Eyewitness Identification," available at: http://www.innocenceproject.org/fix/Eyewitness-Identification.php.

[10]Brandon L. Garrett, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong* 63–68 (Cambridge, MA: Harvard University Press, 2011).

BOX 1-2
Charge to the Committee

The charge to the NRC was to:

1. critically assess the existing body of scientific research as it relates to eyewitness identification;
2. identify any gaps in the existing body of literature and suggest, as appropriate, research questions to pursue that will further our understanding of eyewitness identification and that might offer additional insight into law enforcement and courtroom practices;
3. provide an assessment of what can be learned from research fields outside of eyewitness identification;
4. offer recommendations for best practices in the handling of eyewitness identifications by law enforcement;
5. offer recommendations for developing jury instructions;
6. offer advice regarding the scope of a Phase II consideration of neuroscience research as well as any other areas of research that might have a bearing on eyewitness identification; and
7. write a consensus report with appropriate findings and recommendations.

eyewitness identification and to recommend best practices[11] for handling eyewitness identifications by law enforcement and the courts. The goal of this effort was to evaluate the scientific basis for eyewitness identification, to help establish the scientific foundation for effective real-world practices, and to facilitate the development of policies to improve eyewitness identification validity in the context of the American justice system.

In response to this charge, the NRC appointed an ad hoc committee, the Committee on Scientific Approaches to Understanding and Maximizing the Validity and Reliability of Eyewitness Identification in Law Enforcement and the Courts (hereinafter, the committee), to undertake this study (see Box 1-2 for the committee's charge). The committee met three times, held numerous conference calls, heard from various stakeholders (see Appendix B), and reviewed extensive research on eyewitness identification before reaching its findings and recommendations.

[11]For the purposes of this report, the committee characterizes *best practice* as the adoption of standardized procedures based on scientific principles. The committee does not make any endorsement of practices designated as best practices by other bodies.

SCIENCE AND LAW

Law enforcement officers investigating crimes rely on eyewitness identification procedures to verify that a suspect is the individual seen by an eyewitness.[12] Such procedures can take place under conditions that may have significant effects on the accuracy and reliability of an eyewitness' identification. Unlike officers in the field, laboratory researchers have, in theory, greater control over influences that might contaminate the visual perceptual experience and memory of an eyewitness.

Science is a self-correcting enterprise. Researchers formulate and test hypotheses using observations and experiments, which are then subject to independent review. In science, evidence and data are analyzed and experiments are repeated to ensure that biases or other factors do not lead to incorrect conclusions. Scientific progress results from the review and revision of earlier results and conclusions.

The culture of scientific research is markedly different from a legal culture that must seek definitive results in individual cases. In 1993, in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the U.S. Supreme Court ruled that, under Rule 702 of the Federal Rules of Evidence (which covers both civil and criminal trials in the federal courts), a "trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable."[13]

Criminal justice and legal personnel have come to rely on eyewitness evidence. Law enforcement officials have first-hand experience with eyewitnesses in criminal investigations and trials, and over the years, some juridictions have implemented and strengthened practices and procedures in an attempt to improve acccuracy. Consequently, the law enforcement and legal communities have made important contributions to our understanding of eyewitness identifications and the improvements of practices in the field. Researchers have become increasingly involved in assessing eyewitness identification procedures as law enforcement, lawyers, and judges have themselves sought more accurate procedures and approaches. In the 2009 National Research Council report, *Strengthening Forensic Science in the United States: A Path Forward*, the committee noted, "in addition to protecting innocent persons from being convicted of crimes that they did not commit, we are also seeking to protect society from persons who have

[12]For ease of reading, throughout the report the committee will use the term *officer* to mean law enforcement officials and professionals.

[13]*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). The Court also noted that "there are important differences between the quest for truth in the courtroom and the quest for truth in the laboratory. Scientific conclusions are subject to perpetual revision. Law, on the other hand, must resolve disputes finally and quickly."

committed criminal acts."[14] This shared common goal of protecting innocent persons and society makes collaboration between the scientific, law enforcement, and legal communities critically important.

IDENTIFYING THE CULPRIT

Officers typically use three procedures to identify a perpetrator whose identity is unknown: (1) showups; (2) presentations of photo arrays; and (3) live lineups. A showup is a procedure in which officers present a single criminal suspect to a witness. This procedure usually occurs near the crime location and immediately or shortly after the crime has occurred. Officers also use photo arrays and live lineups, in which they ask the witness to view numerous individuals, one of whom may be the perpetrator. The suspect is presented along with *fillers* (known non-suspects). Currently, photo arrays are used more often than live lineups.[15,16]

If the eyewitness makes a positive identification during a showup, a photo array, or a lineup, the identification may constitute evidence about a suspect's involvement in a crime. The eyewitness identification may, when considered with other available evidence, establish probable cause to support an arrest. Such evidence may play a pivotal role in enabling the prosecution to meet its burden of proof in a subsequent trial.

In recent years, more law enforcement agencies have created written eyewitness identification policies and have adopted formalized training. However, there are many agencies that do not have standard written policies or formalized training for the administration of identification procedures or for ongoing interactions with witnesses.[17]

VISION AND MEMORY

At its core, eyewitness identification relies on brain systems for visual perception and memory: The witness perceives the face and other aspects of the perpetrator's physical appearance and bearing, stores that informa-

[14]National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* (Washington, DC: The National Academies Press, 2009), p. 12.

[15]Police Executive Research Forum, "A National Survey of Eyewitness Identification Procedures in Law Enforcement Agencies," March 2013, p. 48. The survey indicates that 94.1 percent of responding law enforcement agencies reported that they use photo arrays, while only 21.4 percent reported using live lineups. Sixty-one point eight percent of agencies reported that they use showups. See also J. S. Neuschatz et al., "Comprehensive Evaluation of Showups," in *Advances in Psychology and Law*, ed. M. Miller and B. Bornstein (New York: Springer, in press).

[16]Throughout the report, unless otherwise specified, references to *lineups* refer to both photo arrays and live lineups.

[17]Police Executive Research Forum, p. 65.

tion in memory, and later retrieves the information for comparison with the visual percept of an individual in a lineup. Recent years have seen great advances in our scientific understanding of the basic mechanisms, operational strategies, and limitations of human vision and memory. These advances inform our understanding of the accuracy of eyewitness identification.

Human vision does not capture a perfect, error-free "trace" of a witnessed event. What an individual actually perceives can be heavily influenced by bias[18] and expectations derived from cultural factors, behavioral goals, emotions, and prior experiences with the world. For eyewitness identification to take place, perceived information must be encoded in memory, stored, and subsequently retrieved. As time passes, memories become less stable. In addition, suggestion and the exposure to new information may influence and distort what the individual believes she or he has seen.

Several factors are known to affect the fidelity of visual perception and the integrity of memory. In particular, vision and memory are constrained by processing bottlenecks and various sources of noise.[19] Noise comes from a variety of sources, some associated with the structure of the visual environment, some inherent in the optical and neuronal processes involved, some reflecting sensory content not relevant to the observer's goals, and some originating with incorrect expectations derived from memory. The concept of noise has profound significance for understanding eyewitness identification, as the accuracy of information about the environment gained through vision and stored in memory is necessarily, and often sharply, limited by noise.

The recognition of one person by another—a seemingly commonplace and unremarkable everyday occurrence—involves complex processes that are limited by noise and subject to many extraneous influences. Eyewitness identification research confronts methodological challenges that some other basic experimental sciences do not encounter, as well as practical challenges

[18]*Bias* is defined as any tendency that prevents unprejudiced consideration of a question (see Dictionary.com; http://dictionary.reference.com/browse/bias). *Response bias* is a general term for a wide range of influences that moderate the responses of participants away from an accurate or truthful response. Response bias can be induced or caused by a number of factors, all relating to the idea that humans do not respond passively to stimuli, but rather actively integrate multiple sources of information to generate a response in a given situation [(see M. Orne,"On the Social Psychology of the Psychological Experiment: With Particular Reference to Demand Characteristics and Their Implications," *American Psychologist* 17: 776–783, (1962)]. In research, bias is seen in sampling or testing when circumstances select or encourage one outcome or answer over another (see Merriam-Webster.com; http://www.merriam-webster.com/dictionary/bias).

[19]*Noise* refers here to factors that cause uncertainty on the part of an individual about whether a particular signal (e.g. a specific visual stimulus) is present. This use of the term follows the definition used in electronic signal transmission, in which noise refers to random or irrelevant elements that interfere with detection of coherent and informative signals.

in establishing adequate experimental controls over the numerous variables that affect visual perception and memory.

APPLIED RESEARCH ON EYEWITNESS IDENTIFICATION: SYSTEM AND ESTIMATOR VARIABLES

Our understanding of the underlying processes and limits of eyewitness identification, derived from basic research on vision and memory, is complemented by research directed specifically at the problem of eyewitness identification. The modern era of eyewitness identification research began in the 1970s. Today, eyewitness identification is generally viewed as a behavioral output. The accuracy and reliability of eyewitness identification are critically modulated by variables that include a witness' extant cognition and memory and related psychological and situational factors at the time of the event, over the ensuing intervals, and at all stages of recall (see Figure 1-1). Because a crime is an unexpected event, one can draw a natural distinction between variables that reflect the witness' unplanned situational or cognitive state at the time of the crime and the variables that reflect controllable conditions and internal states following the witnessed events. Researchers categorize these factors, respectively, as *estimator variables* and *system variables*.[20]

System variables describe the characteristics of specific procedures and practices (e.g., the content and nature of instructions given to witnesses who are asked if they are able to make an identification). The criminal justice system can exert some control over system variables by following standardized procedures that are based on scientific knowledge and strengthened through education and training.

One important category of system variables concerns the conditions and protocols for lineup identification. Under current law enforcement practice, eyewitness identification procedures involve having a witness view individuals or images of individuals. Research indicates that accuracy and reliability of eyewitness identifications may be influenced by the type of presentation (e.g., lineup) used, the likeness of non-suspect lineup participants (fillers) to the suspect, the number of fillers, and the suspect's physical location in the presentation.[21,22] Eyewitness performance may be affected by how the lineup images are presented—simultaneously (as a group) or

[20]G. L. Wells, "Applied Eyewitness-Testimony Research: System Variables and Estimator Variables," *Journal of Personality and Social Psychology* 36(12):1546–1557 (1978).

[21]N. K. Steblay et al., "Eyewitness Accuracy Rates in Police Showup and Lineup Presentations: A Meta-Analytic Comparison," *Law and Human Behavior* 27(5): 523–540 (October 2003).

[22]R. J. Fitzgerald et al., "The Effect of Suspect-Filler Similarity on Eyewitness Identification Decisions: A Meta-analysis," *Psychology, Public Policy, and Law* 19(2): 151–164 (May 2013).

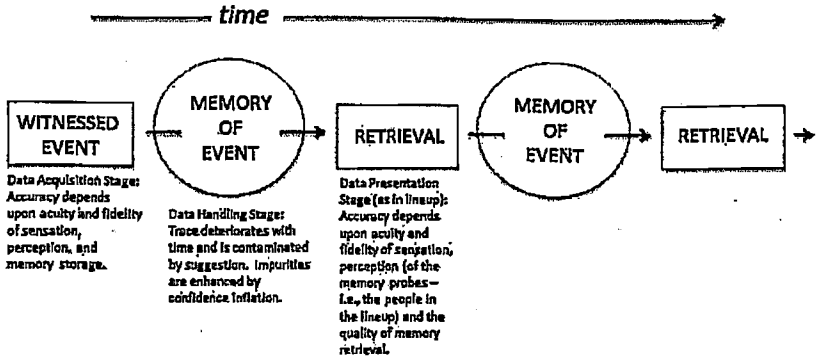


FIGURE 1-1 Memory accuracy and time.
SOURCE: Courtesy of Thomas D. Albright.

sequentially (one at a time). System variables, such as the nature of the instructions and feedback provided before and after the identification procedure, may also affect the eyewitness' identification.

Estimator variables affect the accuracy of eyewitness identification, but they are beyond the control of the criminal justice system. Estimator variables tend to be associated with characteristics of the witness or factors that are operating either at the time of the criminal event (perhaps relating to memory encoding) or the retention interval (the time between witnessing an event and the identification process). Specific examples include the eyewitness' level of stress or trauma at the time of the incident, the light level and nature of the visual conditions that affect visibility and the clarity of a perpetrator's features, and the physical distance between the witness and the perpetrator. Both system and estimator variables will be discussed in detail in subsequent chapters.

EFFORTS AT IMPROVEMENT

In response to insights gained from research on erroneous convictions, there have been attempts to provide recommendations for improving the reliability and validity of eyewitness identifications. An effort of particular note is the National Institute of Justice's (NIJ) Technical Working Group for Eyewitness Evidence (TWGEYEE). Called together by then-U.S. Attorney General Janet Reno in 1998, members of the working group were asked to develop and publish guidance for improving eyewitness identification

procedures.[23] The working group recognized the role that memory plays in the mistaken interpretation and remembrance of events and offered guidance based on the practical experiences of the law enforcement community and insights gained from behavioral and psychological research. The NIJ provided detailed instructions for each step of the eyewitness identification procedure to the approximately 18,000 state and local law enforcement agencies across the nation. After the report was issued, only a few states conducted evaluations and engaged in improvement efforts, including the implementation of new laws and the issuance of corrective guidelines and policies. Consequently, eyewitness identification policies remain fragmented by jurisdiction, except in a minority of states that have adopted state-wide policies. At present, the United States does not have a uniform national set of protocols.[24]

JUDICIAL CONSIDERATION OF EYEWITNESS IDENTIFICATION EVIDENCE

The U.S. Supreme Court's 1977 ruling in *Manson v. Brathwaite* provides the current framework for judicial review of eyewitness identification under the Due Process Clause of the U.S. Constitution.[25] The *Manson v. Brathwaite* test asks judges to evaluate the "reliability" of eyewitness identifications using factors derived from prior rulings and not from empirically validated sources. The *Manson v. Brathwaite* ruling was not based on much of the research conducted by scientists on visual perception, memory, and eyewitness identification, and it fails to include important advances that have strengthened standards for judicial review of eyewitness identification evidence at the state level.

In 2011, the Justices of the Massachusetts Supreme Judicial Court convened the Study Group on Eyewitness Identification to "offer guidance as to how our courts can most effectively deter unnecessarily suggestive identification procedures and minimize the risk of a wrongful conviction." The report made five recommendations to minimize inaccurate identifications: (1) acknowledge variables affecting identification accuracy; (2) develop a model policy and implement best practices for police departments; (3) expand use of pretrial hearings; (4) expand use of improved jury instructions; and (5) offer continuing education.[26]

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[23]U.S. Department of Justice, Office of Justice Programs, *Eyewitness Evidence: A Guide for Law Enforcement* (Washington, DC, 1999).

[24]Police Executive Research Forum, p. 65.

[25]*Manson v. Brathwaite*, 432 U.S. 98, 114 (1977).

[26]Massachusetts Supreme Judicial Court Study Group on Eyewitness Identification, *Report and Recommendations to the Justices*, July 24, 2013, available at: http://www.mass.gov/courts/docs/sjc/docs/eyewitness-evidence-report-2013.pdf.

In 2011, the New Jersey Supreme Court issued a unanimous decision in *State v. Larry R. Henderson*. The opinion revised the legal framework for evaluating and admitting eyewitness identification evidence and directed that improved jury instructions be prepared to help jurors evaluate such evidence. *Henderson* drew on an extensive review of scientific evidence regarding human vision, memory, and the various factors that can affect the reliability of eyewitness identifications. In July 2012, the court released expanded jury instructions and revised court rules relating to eyewitness identifications in criminal cases.[27]

In fall 2012, the Oregon Supreme Court also established a new procedure for evaluating whether eyewitness identifications could be used in court. In *State v. Lawson*, the Court reviewed eyewitness identification research conducted over the past 30 years, determined that the *Manson v. Brathwaite* test "does not accomplish its goal of ensuring that only sufficiently reliable identifications are admitted into evidence," and offered a revised procedure that requires the court to make a determination of whether investigators used "suggestive" tactics to get an identification and the extent to which other information supports the identification.[28]

Despite these improvements and judicial decisions, policies and practices across the country remain inconsistent.

ORGANIZATION OF THE REPORT

This report begins with a description of law enforcement protocols for eyewitness identification (Chapter 2). Chapter 3 presents the legal framework for eyewitness identification evidence. A discussion of the current scientific understanding of visual perception and memory follows in Chapter 4. In Chapter 5, the committee provides an assessment of eyewitness identification research. The report concludes with the committee's findings and recommendations (Chapter 6).

[27]New Jersey Judiciary, "Supreme Court Releases Eyewitness Identification Criteria for Criminal Cases," July 19, 2012, available at: http://www.judiciary.state.nj.us/pressrel/2012/pr120719a.htm.

[28]*State v. Lawson*, 352 Or. 724 (Or. 2012).

2

Eyewitness Identification Procedures

Police in the United States investigate millions of crimes each year.[1] Only a small percentage of the police-investigated crimes involve the use of police-arranged identification procedures. Identification procedures are unnecessary when, for example, the perpetrator is caught during the commission of the criminal act, as in the crime of driving while intoxicated, or when the victim knows the perpetrator, as in crimes of domestic violence.[2]

Police use identification procedures for numerous reasons. In some circumstances, the police identify a suspect during an investigation and use the identification procedure to test a witness' ability to identify the suspect as the perpetrator. In other instances, the identification procedure is used as an investigative tool to further an investigation. A positive identification might form probable cause for a search warrant or the apprehension and subsequent questioning of a suspect, or both. Most significant for the purposes of this report are the circumstances in which a witness positively identifies the police suspect as the perpetrator, and the identification serves as compelling evidence in the prosecution of a case.

Data on the number of eyewitness identification procedures are not systematically or uniformly collected. While the exact number of eyewitness

[1]Federal Bureau of Investigation, "Crime in the United States 2012: Persons Arrested," available at: http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/persons-arrested/persons-arrested.

[2]Throughout Chapter 2, the terms *law enforcement* and *police* are used interchangeably and refer to all law enforcement agencies at the local, state, and federal levels.

identification procedures related to crimes involving strangers is unknown, mistaken identifications have disastrous effects for those wrongly accused of crimes and for society should a guilty person go free. Mistaken identifications may also erode public confidence in the criminal justice system as a whole.[3] Recently, some police departments and prosecutors have implemented stringent eyewitness identification procedures in an effort to reduce erroneous convictions.[4]

Police-arranged eyewitness identification procedures vary greatly depending on the nature of the case. In some cases, a police-arranged identification is conducted at the very early stages of an investigation. For instance, consider the circumstance in which police respond to a bank robbery in progress. The perpetrator is described as a white male, approximately 6 feet, 2 inches in height wearing an orange shirt. As the police arrive at the crime scene, an officer observes and apprehends a man fleeing the bank wearing an orange shirt and exhibiting similar physical characteristics. In this situation, a police-arranged identification procedure may be conducted on the scene and prior to any significant investigation. At the other extreme are, for example, lengthy homicide or rape cases that include extensive investigations, forensic testing, and eyewitness interviews conducted over a protracted period of time. Such efforts may culminate in the identification of a suspect and the suspect's inclusion in a photo array identification procedure. In such a circumstance, an eyewitness may not be asked to identify a perpetrator until months after the commission of the crime—and often after repeated probes of her or his memory by, for example, police, family members, and others.

Identification procedures may be used in different ways for different purposes. They are not always used to identify an unknown perpetrator of a crime. The police may, for example, use photo arrays and confirmatory single photographs to clarify the legal identity (birth name/government name) of an individual who is well known to a witness, but only by a street name. In such examples, a witness may know (and may have known) the perpetrator for years but may only be able to identify him by a common

[3]See, generally, The International Association of Chiefs of Police, "National Summit on Wrongful Convictions: Building a Systemic Approach to Prevent Wrongful Convictions," August 2013.

[4]See The Innocence Project, *Eyewitness Identification*, available at: http://www.innocenceproject.org/fix/Eyewitness-Identification.php; U.S. Department of Justice, Office of Justice Programs, *Eyewitness Evidence: A Guide for Law Enforcement* (Washington, DC, 1999); Metropolitan Police—District of Columbia, *General Order—Procedures for Obtaining Pretrial Eyewitness Identification*, April 18, 2013; New York State District Attorneys Association Best Practice Committee, *New York State Photo Identification Guidelines*, October 2010; Rhode Island Police Chiefs Association, *Lineup and Showup Procedures (Eyewitness Identification)*, November 2011; and Innocence Project of Texas, *Eyewitness Identification Reform*, available at: http://www.ipoftexas.org/eyewitness-id.

street name, such as "Prince." The police typically will use an identification procedure to identify the "Prince" to which the witness is referring before they make an arrest or take other investigative measures such as the execution of a search warrant.

This chapter reviews the eyewitness identification procedures commonly used by the police and concludes with a brief discussion of situations in which citizens engage in identifying perpetrators without police assistance.

PHOTOGRAPHIC ARRAY

The photo array is the most common police-arranged identification procedure used in the United States.[5] A photo array consists of six to nine photographs displayed to a witness. An officer might create an array by selecting photographs of persons deemed to resemble the perpetrator.[6] Officers might then display the photographs one at a time to the witness and ask whether she or he recognizes each one. This method is known as a sequential procedure. Officers might also create photo arrays by cutting six square holes in a folder and taping the photographs to the back of the folder so that the faces of the fillers (non-suspects) and suspect are displayed together. When such photographs are presented simultaneously as a two by three matrix, this type of array is referred to as a "six pack." When, as in this instance, photographs are displayed together, this is referred to as a simultaneous procedure.

In 1999, Attorney General Janet Reno released the U.S. Department of Justice, *Eyewitness Evidence: A Guide for Law Enforcement*,[7] one of the earliest efforts to establish standardized procedures for police-arranged eyewitness identification. The guide set forth rigorous criteria and basic procedures to promote accuracy in eyewitness evidence.[8] However, after the guide was released, most police departments in the United States did not adopt these procedures.

Today, many police departments use computer systems to access image databases and assemble photo arrays. Officers enter physical characteristics (e.g., race, gender, hair color) specific to the suspect into a computer, and the system retrieves filler photographs with the desired attributes. If an officer determines that a photograph in the array is suggestive or otherwise inappropriate, she or he can reject one or more fillers and instruct the system

[5]Police Executive Research Forum, "A National Survey of Eyewitness Identification Procedures in Law Enforcement Agencies," March 2013, p. 48.

[6]Historically, the photographs were mug shots in the possession of a police department.

[7]U.S. Department of Justice, Office of Justice Programs, *Eyewitness Evidence: A Guide for Law Enforcement* (Washington, DC, 1999).

[8]Ibid, pp. 11–38.

to provide alternate photographs. Departments may conduct the procedure without revealing to the witness how many photographs she or he will view.

In recent decades, many police agencies and prosecutors have adopted sequential presentation of photographs, based on the belief that this approach improves the performance of an eyewitness. Currently, however, there is no consensus among law enforcement professionals as to whether the sequential presentation procedure is superior to the simultaneous procedure (see Chapter 5). The District of Columbia Metropolitan Police Department, for example, does not endorse either simultaneous or sequential procedures in its *Procedures for Obtaining Pretrial Eyewitness Identification.*[9] The District Attorneys Association of the State of New York in 2010 adopted recommended policies for New York State and endorsed the simultaneous method.[10] On the other hand, in North Carolina, legislation was passed that requires that lineup photographs be presented sequentially,[11] and in Massachusetts, the Supreme Judicial Court Study Group on Eyewitness Identification recommended sequential procedures as best practice for Massachusetts Police Departments.[12]

The committee was presented with information regarding improvement efforts from states including New Jersey, Oregon, Rhode Island, Texas, New York, and Massachusetts. However, the committee is unable to determine the percentage of police departments that have adopted policies for eyewitness identification procedures and instituted training in these procedures.[13] Some police departments require that photo arrays be presented to the witness during a procedure that is either "double blind" or "blinded."[14] (See Box 2-1 for a discussion of blinding as used in scientific practice and blinding as used in eyewitness identification procedures.) Blinding is used to prevent conscious and unconscious cues from being given to the witness. In a double-blind procedure, an individual who does not know the identity of the suspect or the suspect's position in the photo array shows a photo array to the eyewitness. In cases where such a double-blind procedure is

[9]See Metropolitan Police—District of Columbia, *General Order—Procedures for Obtaining Pretrial Eyewitness Identification,* April 18, 2013.

[10]See New York State District Attorneys Association Best Practice Committee, *New York State Photo Identification Guidelines,* October 2010.

[11]N.C. Gen. Stat. § 15A-284.52 (West 2007).

[12]See Massachusetts Supreme Judicial Court Study Group on Eyewitness Identification, *Report and Recommendations to the Justices* (2013).

[13]The Police Executive Research Forum's 2013 survey of eyewitness identification procedures in law enforcement agencies [Police Executive Research Forum, *A National Survey of Eyewitness Identification Procedures in Law Enforcement Agencies,* (2013)], notes that most agencies that completed the survey have no written policy for eyewitness identification procedures and that more agencies provide training to their employees than have written policies. See pp. 79–80.

[14]Police Executive Research Forum, p. 64.

not feasible, a "blinded" procedure will approximate the condition of double-blinding. For example, the photo array may be administered by an individual who knows who the suspect is, but is unable to tell when the witness is looking at the suspect's photo and so is unable to provide even subconscious feedback to the witness. In one common "blinded" procedure, the officer places each photo in a separate envelope or folder and then shuffles the envelopes/folders so that only the witness sees the images therein. Additional recommendations to minimize the possibility of biasing feedback to the witness include requiring that the officer read instructions to the witness from a pre-printed form.[15]

If the witness identifies someone from the photo array, some departments ask the witness for a confidence statement. Based upon information presented to the committee, it appears that police departments do not always document identification procedures in instances when an identification is not made. Further, if a witness does make an identification, practices differ as to how such information is documented and preserved. Some agencies, for example, require officers to document this information in a written report. Others make audio or video recordings of the identification procedure.

LIVE LINEUP

A live lineup is a police-arranged identification procedure in which the physical suspect and fillers stand or sit in front of the witness (either individually, i.e., sequentially or en masse, i.e., simultaneously). The police generally use at least five fillers. Fillers are selected for their physical similarities to the suspect (gender, race, hair length and color, facial hair, height, skin tone, and other distinguishing features). The fillers are presumed to be unknown to the witness. Traditionally, the suspect and fillers are seated or stood in a row, and the witness views the lineup from behind a two-way mirror. Police use both simultaneous and sequential procedures for live lineups.

Live lineups are used in some jurisdictions, but they are not the predominant method used by law enforcement.[16] The use of these police identification procedures is limited for a variety of reasons. First, in certain circumstances, legal counsel may be required at a lineup, thereby making it less attractive to police and prosecutors. Second, in smaller jurisdictions, it may be difficult to obtain suitable fillers (e.g., those with appropriate

[15]As discussed in Chapter 3, the courts have been sensitive to the potential for misidentification resulting from "suggestive" identification procedures and have set standards for admissibility of evidence.

[16]Police Executive Research Forum, p. 48.

BOX 2-1
Blinding

Empirical evidence[a] has shown that the beliefs, desires, and expectations of researchers can influence, often subconsciously, how they observe and interpret the phenomena they study and thus the outcomes of experiments. This evidence has influenced how scientists carry out their experiments, resulting in the use of blind or double-blind procedures to control for this form of bias. Blind assessment[b] has been used since the late 18th century; an early medical trial in 1835 used double-blind assessment, and psychologists started using blinding in the 20th century.[c] By the 1950s, blind assessment in randomized controlled trials was considered standard procedure in both psychological and medical research. Currently, virtually all of science uses some form of blinding.

In single-blind experiments, participants do not know which treatment they are receiving; this form of blinding is used widely across scientific fields. In experiments involving humans, as in medical or psychological research, double-blind procedures are used to guard against "expectancy effects" for both participants and researchers. In a classic double-blind clinical trial, some patients receive active medication and others are given an alternative (either a "standard treatment" or a similar-looking placebo without active ingredients), but neither researchers nor participants know who is receiving which treatment.

In an eyewitness identification setting, double-blinding can be used to prevent a lineup administrator from either intentionally or unintentionally influencing a witness. In these cases, neither the eyewitness nor the administrator knows which persons in a photo array or live lineup are the suspected culprits and which are the fillers.[d,e] In eyewitness identification procedures, as in science, the purpose of double-blinding is to prevent the conscious or subconscious expectations of the administrator from influencing the witness or research outcomes.

In a double-blind photo array, the officer or detective conducting the investigation reads a set of standard instructions to the witness. The instructions may include an advisory that the officer about to show the photos does not know whether any of the photos are of the person who committed the crime. The officer then leaves the room and a second officer—perhaps a patrol officer—displays the

physical similarities to the suspect). Third, conducting a lineup requires a significant amount of time and labor,[17] thereby making photo arrays a more attractive alternative that may be undertaken promptly and with less demand on department resources.

[17]Live lineup construction may be further constrained by the inability to hold a suspect in custody without probable cause. See Chapter 3.

photos. It is the duty of this second officer (the "blind administrator") to show the photos and, if an identification is made, document what the witness said and ask the witness how certain she or he is of their identification. Once all photos have been shown, the officer reports the result of the procedure to the investigating officer (preferably out of earshot from the witness).

As an alternative to a double-blind array, some departments use "blinded" procedures. A blinded procedure prevents an officer from knowing when the witness is viewing a photo of the suspect, but can be conducted by the investigating officer. A common approach is the so-called "folder shuffle." With a six-photo array, an officer uses eight manila folders. A photograph of a filler is placed in the top folder, and a photograph of the suspect and four additional fillers are placed in the next five folders. The six folders are then shuffled so that the officer does not know which folder contains the image of the suspect. Two folders with blank paper are placed on the bottom of the stack so that the witness is led to believe that there are more than six images in the array (this is referred to as back-loading, and it prevents the witness from knowing when she or he is about to view the last photograph). After reading instructions to the witness, the administering officer sits to the witness' left and hands him or her one folder at a time and instructs him/her to open each folder and look at the enclosed photo. The cover of the folder blocks the officer from viewing the photo that the witness is viewing. When an identification occurs, the officer notes the witness' words and reaction and asks about the witness' confidence in his or her identification.

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[4]R. Rosenthal, *Experimenter Effects in Behavioral Research* (New York: John Wiley, 1976).

[5]M. Stolberg, "Inventing the Randomized Double-Blind Trial: The Nuremberg Salt Test of 1835," *James Lind Library Bulletin* (2006), available at: http://www.jameslindlibrary.org/illustrating/articles/inventing-the-randomized-double-blind-trial-the-nuremberg-salt.

[6]J. Kaptchuk, "Intentional Ignorance: A History of Blind Assessment and Placebo Controls in Medicine," *Bulletin of the History of Medicine* 72(3): 389–433 (1998).

[7]P. Klimartin, Presentation to the committee, February 6, 2014.

[8]K. Hamann, Presentation to the committee, December 2, 2013.

SHOWUP

A showup is a police-arranged identification procedure in which the police show one person to a witness and ask if she or he recognizes that person. This procedure typically is used when the police locate a suspect shortly after the commission of a crime and within close proximity to the scene. Case law limits the time and distance from a crime during which such a procedure will pass legal standards. In response to such case law, police typically restrict showups to a two-hour time period after the commis-

sion of a crime. Ideally, officials take the witness to the location where the suspect has been detained and do not display the suspect in a suggestive manner (e.g., not in a police car, not handcuffed, without drawn weapons). However, as chases, fights, or disarmaments frequently precede showups, the apprehension of a suspect can raise safety issues that make it difficult to adhere to recommended procedures. Further, the nature of a showup does not lend itself to the use of a blinded procedure. A showup is designed to promptly clear innocent suspects, thereby sparing them from a prolonged period of detention as the investigation continues. Delaying the showup to locate an uninvolved officer may defeat that purpose. While some law enforcement agencies use a standard procedure with written instructions when conducting a showup, there is no indication that such procedures are used uniformly. Courts consider showups highly suggestive, and prosecutors urge the police to exercise caution when conducting them.

CONFIRMATORY PHOTOGRAPH

Police will, on occasion, display a single photograph to a witness in an effort to confirm the identity of a perpetrator. Police typically limit this method to situations in which the perpetrator is previously known to or acquainted with the witness.

FIELD VIEW

Police also use field views in attempts to identify perpetrators. The method, which involves inviting a witness to view many people in a context where the perpetrator is thought likely to appear, is used when the police do not have a suspect but believe that the offender frequents a particular location. For example, police investigating a purse snatching may obtain information that the perpetrator frequents a particular recreation site during the lunch hour. A plainclothes officer or investigator might take the eyewitness to the site and walk around with him or her during the lunch hour without directing his or her attention to any specific individual.

OTHER PROCEDURES—MUG BOOKS AND YEARBOOKS

At times, police use other means to identify perpetrators. In the past, police sometimes had witnesses review mug shot books. Mug books have since been largely replaced by digitized images displayed on computer screens. Nonetheless, there are situations in which the police will have a witness review a large collection of photographs in an effort to identify a perpetrator. Witnesses who identify a perpetrator as being a student at a specific school might be asked to review a yearbook for that school in an

effort to identify the perpetrator. When using this method, police typically attempt to mask the names of the students. Similarly, if the offender is believed to be an individual from a certain profession, then the police might have the witness review photographs from the suspect's professional society. Social media sites also serve as the catalyst for police-arranged identification procedures. If a witness knows that the perpetrator is a "friend" of Jane Doe through social media, then the police might have the witness review all friends of Jane Doe to see if she or he recognizes the individual.

All of these additional procedures (i.e., confirmatory photo, field view, mug books, yearbooks) have the potential to introduce biases of the sort that blind lineup procedures are designed to avoid.

NON-POLICE IDENTIFICATION PROCEDURES

In some cases, the victims or witnesses, or both, identify suspects without involving the police. A private citizen, organization, or corporation may conduct an investigation before, during, or even after reporting a crime to the police. The identification of suspects by entities other than law enforcement has become increasingly common as more businesses and private citizens use security cameras to identify criminal actors. High-resolution cameras coupled with high-capacity hard drives allow for real-time streaming of video with superior clarity. Such systems are relatively inexpensive and within financial reach of many home and business owners. Additionally, the proliferation of smart phones has put the ability to create a spontaneous, high-quality video record of an event into the hands of more and more people.

The rise of social media has resulted in the rise of private investigations and identifications using this resource. In one recent case, a stabbing victim drew a picture of her assailant and showed it to her husband.[18] Upon viewing the picture, the husband believed that the assailant looked familiar and might be his ex-girlfriend. He obtained several photographs of the ex-girlfriend from her personal website and showed them to the victim who, after looking at those and other online images, identified the suspect at a lineup and at trial.

CONCLUSION

Many local, state, and federal law enforcement agencies have adopted policies and practices to address the issue of misidentification. However, efforts are not uniform or systemic.[19] Many agencies are unfamiliar with

[18] *New Jersey v. Chen*, 27 A.3d 930 (N.J. 2011).

[19] See Massachusetts Supreme Judicial Court Study Group on Eyewitness Evidence, p. 2.

the science that has emerged during the past few decades of research on eyewitness identifications. Questions remain about the optimal design of photo array procedures, including the size of the array, the contents of the photographs, and their relationship to the context of the crime scene. Similar questions apply to the design of live lineups.[20] Eyewitness identification is further complicated by the increasing number of situations in which victims and witnesses seek to identify the perpetrator of a crime without the aid of law enforcement. Such identifications raise new concerns about reliability and accuracy of the identification of individuals. Inconsistent and nonstandard practices might easily add noise to the eyewitness identification process, contaminate the witness, and bias the outcome of an identification procedure.

[20]The design of a live lineup is subject to more practical constraints than a photo array.

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The Legal Framework for Assessment of Eyewitness Identification Evidence

The admissibility of eyewitness testimony at a criminal trial may be challenged on the basis of procedures used by law enforcement officials in obtaining the eyewitness identification. The U.S. Supreme Court, in its 1977 ruling in *Manson v. Brathwaite,* set out the modern test under the Due Process Clause of the U.S. Constitution that regulates the fairness and the reliability of eyewitness identification evidence.[1] The Court also specified five reliability factors, discussed below, that a judge must consider when deciding whether to exclude the identification evidence at trial.[2]

Although the constitutional standards for assessing eyewitness testimony have remained unchanged in the decades since the *Manson v. Brathwaite* decision, a body of research has shed light on the extent to which each of the five reliability factors supports a reliable eyewitness identification. Research has cast doubt, for instance, on the belief that the apparent certainty displayed in the courtroom by an eyewitness is an indicator of an accurate identification, and has found that a number of factors may enhance the certainty of the eyewitness.

Recently, state courts and lower federal courts have taken the lead in developing standards relating to the admissibility of expert evidence, jury instructions, and judicial notice of scientific evidence. Some states have adopted more stringent standards for regulating eyewitness identification evidence than the U.S. Constitution requires, either by legislative statutes or by state court decisions, and have modified or entirely supplanted the *Man-*

[1] *Manson v. Brathwaite,* 432 U.S. 98, 113–114 (1977).
[2] *Manson v. Brathwaite* at 114.

son v. Brathwaite test to take account of advances in the growing body of scientific research. This chapter describes the changes in the legal standards for eyewitness identification and explores the relationship between the state of the scientific research and the law regulating procedures and evidence.

EYEWITNESS EVIDENCE AND DUE PROCESS UNDER THE U.S. CONSTITUTION

Beginning with rulings in 1967, the U.S. Supreme Court set out a standard under the Due Process Clause of the Fourteenth Amendment for reviewing eyewitness identification evidence.[3] In *Manson v. Brathwaite*, the Court emphasized that "reliability is the linchpin in determining the admissibility of identification testimony."[4] First, the Court instructed judges to examine whether the identification procedures were unnecessarily suggestive. Second, to assess whether an identification is reliable, judges were instructed to examine the following five factors: (1) the opportunity of the witness to view the criminal at the time of the crime; (2) the witness' degree of attention; (3) the accuracy of the witness' prior description of the criminal; (4) the level of certainty demonstrated at the confrontation; and (5) the time between the crime and the identification procedure.[5] The five factors were drawn from earlier judicial rulings and not from scientific research.[6]

Eyewitness identification evidence continues to be litigated primarily under the flexible two-part *Manson v. Brathwaite* Due Process test.[7] It is

[3]In *Stovall v. Denno*, 388 U.S. 293, 302 (1967), the U.S. Supreme Court first set out a due process rule asking whether identification procedures used were "so unnecessarily suggestive and conducive to irreparable mistaken identification." The Court elaborated that rule in decisions such as *Simmons v. U.S.*, 390 U.S. 377, 384 (1968) and *Foster v. California*, 394 U.S. 440, 442 (1969), and then adopted an approach setting out "reliability" considerations in *Neil v. Biggers*, 409 U.S. 188 (1972). For a description of the development of this doctrine, see, e.g., B. L. Garrett, "Eyewitnesses and Exclusion," *Vanderbilt Law Review* 65(2): 451, 463–467 (2012).

[4]*Brathwaite*, 423 U.S. at 114.

[5]*Id.* at 114.

[6]*Id.* at 114. Justice Thurgood Marshall dissented, noting studies indicated that unnecessarily suggestive eyewitness identifications had resulted in "repeated miscarriages of justice resulting from juries' willingness to credit inaccurate eyewitness testimony." 432 U.S. at 125–27 (Marshall, J., dissenting).

[7]Due process is the most important constitutional right that arises in challenges to eyewitness identification, but rights under the Fourth and Sixth Amendments also may be implicated. The Fourth Amendment protects individuals "against unreasonable searches and seizures," and the probable cause typically required to seize and arrest a suspect may arise from an eyewitness identification. U.S. Const. Amend. IV. The few lower courts to address the question are divided on whether probable cause is needed to place individuals in a live lineup procedure. *Biehunik v. Felicetta*, 441 F.2d 228, 230 (2d Cir. 1971); but see, e.g., *Wise v. Murphy*, 275 A.2d 205, 212–15 (D.C. 1971); *State v. Hall*, 461 A.2d 1155 (N.J. 1983). In contrast,

important to note, however, that the vast majority of criminal cases are settled through plea bargaining. The role that evidence type and strength play in plea bargaining is complex and necessarily difficult to study. Because eyewitness identification evidence may never be tested at trial, it is doubly important for lawyers and judges to understand the credibility of the proffered evidence.[8]

In the most recent U.S. Supreme Court ruling addressing a challenge to an eyewitness identification (*Perry v. New Hampshire*),[9] the Court ruled that a due process analysis was not triggered. In that case, while the police were obtaining a description of the suspect, the eyewitness looked out of the apartment window and recognized the suspect standing outside. The police had not intended to conduct an identification procedure. In those circumstances, the Court ruled that the Due Process Clause does not require a preliminary judicial review of the reliability of an eyewitness identification.[10]

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probable cause is not required to place a person's photograph in an array, since doing so does not involve a seizure. However, courts may also rule that an illegal stop or seizure renders a subsequent identification inadmissible, absent an "independent" source for the courtroom identification. *U.S. v. Crews*, 445 U.S. 463, 473 (1980).

In addition, the Sixth Amendment provides that, in all criminal prosecutions; the accused has the right "to have the assistance of counsel for his defense." In *United States v. Wade*, the Supreme Court held that, once indicted, a person has a right to have a lawyer present at a lineup, reasoning that the right to counsel applies at all "critical" stages of the criminal process. 388 U.S. 218, 235–37 (1967). However, the Court subsequently held that a photo array procedure, of the type now most commonly used by police agencies, does not implicate the *Wade* right to counsel. *U.S. v. Ash*, 413 U.S. 300, 321 (1973).

[8]As the current report demonstrates, a comparative consideration of evidence value is particularly important in the case of eyewitness identification evidence. Similar consideration should be given when other adjudication mechanisms are used (e.g., bench trials).

[9]*Perry v. New Hampshire*, 132 S. Ct. 716, 718 (2012). In that case, the eyewitness happened to look out her window and see the suspect standing at the crime scene where the police had told him to wait. The Court held that the Due Process Clause did not regulate such a situation, since the police did not intend to conduct an identification procedure. *Id.* at 729. The Court indicated that the reliability of the evidence could be addressed by federal and state evidentiary standards, and added: "In appropriate cases, some States also permit defendants to present expert testimony on the hazards of eyewitness identification evidence." *Id.*

[10]Justice Sotomayor dissented, arguing, "Our due process concern . . . arises not from the act of suggestion, but rather from the corrosive effects of suggestion on the reliability of the resulting identification," and the manner in which "[a]t trial, an eyewitness' artificially inflated confidence in an identification's accuracy complicates the jury's task of assessing witness credibility and reliability." *Perry*, 132 S. Ct. at 731–32 (Sotomayor, J., dissenting). Justice Sotomayor also emphasized: "A vast body of scientific literature has reinforced every concern our precedents articulated nearly a half-century ago." *Id.* at 738.

STATE LAW REGULATION OF EYEWITNESS EVIDENCE

State Supreme Court Standards

Several state supreme courts have altered or supplemented the federal *Manson v. Brathwaite* due process rule to focus more on the effects of suggestion, to emphasize certain factors in specific circumstances,[11] or to focus on showup identifications in particular.[12] New Jersey and Oregon have now supplemented the *Manson v. Brathwaite* test with separate state law standards regulating eyewitness identification evidence.

In 2011, the New Jersey Supreme Court issued a unanimous decision in *State v. Larry R. Henderson* that revised the legal framework for admitting eyewitness identification evidence and directed that revised jury instructions be prepared to help jurors evaluate such evidence.[13] The new framework was based on the record of hearings before a Special Master that considered an extensive review of scientific research regarding eyewitness identifications.[14] The legal framework established by the *Henderson* opinion relies on pretrial hearings to review eyewitness evidence and more comprehensive jury instructions at trial.[15] To obtain a pretrial hearing, a defendant must show some evidence of suggestiveness related to either estimator or system

[11]See *State v. Ramirez*, 817 P.2d 774, 780–81 (Utah 1991) (altering three of the reliability factors to focus on effects of suggestion); *State v. Marquez*, 967 A.2d 56, 69–71 (Conn. 2009) (adopting criteria for assessing suggestion); *Brodes v. State*, 614 S.E.2d 766, 771 & n.8 (Ga. 2005) (rejecting eyewitness certainty jury instruction); *State v. Hunt*, 69 P.3d 571, 576 (Kan. 2003) (adopting Utah's five factor "refinement" of the *Biggers* factors); *State v. Cromedy*, 727 A.2d 457, 467 (N.J. 1999) (requiring, when applicable, instruction on cross-racial misidentifications).

[12]See, e.g., *State v. Dubose*, 285 Wis.2d 143, 166 (Wis. 2005); *Commonwealth v. Johnson*, 650 N.E.2d 1257, 1261 (Mass. 1995); *People v. Adams*, 423 N.E.2d 379, 383–84 (N.Y. 1981).

[13]*State v. Henderson*, 27 A.3d 872 (N.J. 2011). The *Henderson* opinion described criticisms of the *Manson v. Brathwaite* test, including that suggestion may itself affect the seeming "reliability" of the identification. *Id.* at 877–78. For examples of scholarly criticism of the *Manson v. Brathwaite* test in light of scientific research, see, e.g., G. L. Wells and D. S. Quinlivan, "Suggestive Eyewitness Identification Procedures and the Supreme Court's Reliability Test in Light of Eyewitness Science: 30 Years Later," *Law and Human Behavior* 33(1): 1, 16 (February 2009); T. P. O'Toole and G. Shay, "*Manson v. Brathwaite* Revisited: Towards a New Rule of Decision for Due Process Challenges to Eyewitness Identification Procedures," *Valparaiso University Law Review* 41(1): 109 (2006).

[14]See Report of the Special Master at 16–17, *State v. Henderson*, No. A-8-08 (N.J. June 18, 2011, available at: http://www.judiciary.state.nj.us/pressrel/HENDERSON%20FINAL%20BRIEF%20.PDF%20(00621142.pdf.

[15]In the companion case, *State v. Chen*, 27 A.3d 930, 932 (N.J. 2011), the New Jersey Supreme Court took an approach that departed from that of the U.S. Supreme Court in *Perry*, ruling that the defendant may be entitled to a hearing in a case in which the eyewitness identified the defendant using social media, not a police-orchestrated identification procedure.

variables that could lead to mistaken identification.[16] At the pretrial hearing, the State must offer proof that the eyewitness identification is reliable. However, the ultimate burden of proving a "very substantial likelihood of irreparable misidentification" is on the defendant.[17]

In July 2012, the New Jersey Supreme Court released an expanded set of jury instructions and related rules that govern the use of suggestive identifications.[18] The jury instructions state that "[r]esearch has shown that there are risks of making mistaken identifications" and noted that eyewitness evidence "must be scrutinized carefully."[19] Human memory involves three stages—encoding, storage, and retrieval. At "each of these stages, memory can be affected by a variety of factors."[20] The Court identified a set of factors that jurors should consider when deciding whether eyewitness identification evidence is reliable, including estimator variables (e.g., stress, exposure duration, weapon focus, distance, lighting, intoxication, disguises or changed appearance of the perpetrator, time since the incident, and cross-racial effects) and system variables (e.g., lineup composition, fillers, use of multiple viewings, presence of feedback, use of double-blind procedures, and use of showup identifications). The instructions also noted the possible influence of outside opinions, descriptions or identifications by other witnesses, and photographs or media accounts.[21]

In 2012, in *Oregon v. Lawson*, the Oregon Supreme Court established a new procedure for evaluating the admissibility of eyewitness identifications. In a unanimous decision, the Court found "serious questions" about the reliability of eyewitness identification, citing research conducted over the past 30 years.[22] The Court determined that the *Manson v. Brathwaite* two-step process for weighing eyewitness identification "does not accomplish its goal of ensuring that only sufficiently reliable identifications are admitted into evidence," because it relies on an eyewitness' self-reports to determine whether the threshold level of suggestiveness is reached, rendering the identification unreliable.[23] The Court set forth a process that requires the trial court to examine whether investigators used "suggestive"

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[16] *Henderson*, 27 A.3d. at 878.

[17] *Id.*

[18] New Jersey Criminal Model Jury Instructions, *Identification* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/jury_instruction.pdf; New Jersey Court Rule 3:11, *Record of an Out-of-Court Identification Procedure* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/new_rule.pdf; New Jersey Court Rule 3:13-3, *Discovery and Inspection* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/rev_rule.pdf.

[19] See New Jersey Criminal Model Jury Instructions, *Identification, supra* at 2.

[20] *Id.*

[21] *Id.* at 9.

[22] *State v. Lawson*, 352 Ore. 724 (Or. 2012).

[23] *Id.* at 746–748.

identification procedures and whether other factors, such as estimator variables, may have affected the reliability of the identification.[24] The Court ruled that "intermediate remedies," including the use of expert testimony, should be available even if the trial judge concludes that the identification is admissible. The Court also briefly noted that judges might use "case-specific jury instructions."[25]

Other states continue to explore possible changes to the judicial review of eyewitness identification evidence. In 2013, the Massachusetts Supreme Judicial Court Study Group on Eyewitness Identification offered guidance on the adjudication of eyewitness identification evidence.[26] The report adopted *Lawson*'s approach of taking judicial notice of "certain scientifically-established facts about eyewitness identification."[27] The report recommended that trial judges conduct pretrial hearings to determine whether suggestive identification procedures were used, and if so, whether these procedures impaired the reliability of identification evidence. Pretrial hearings would consider the effects of both estimator variables (relating to viewing at the crime scene) and system variables (relating to the lineup or showup procedures) on the identification. The report also recommended that the state adopt a set of recommended practices for conducting identification procedures, create new model jury instructions on eyewitness identifications, and set limitations on the admissibility of certainty statements and in-court identifications.[28]

State Statutes Regulating Identification Procedures

Judicial rulings regulating admissibility of eyewitness evidence in the courtroom do not specify the identification procedures to be used by law enforcement officials. However, 14 states have adopted legislation regarding eyewitness identification procedures. Of the 14, 11 states (Connecticut, Illinois, Maryland, North Carolina, Ohio, Texas, Virginia, West Virginia, Wisconsin, Utah, and Vermont) have enacted statutes directly requiring that

[24] *Id.* at 747–748, 755–756.

[25] *Id.* at 759, 763.

[26] See Massachusetts Supreme Judicial Court Study Group on Eyewitness Evidence, *Report and Recommendations to the Justices* (2013).

[27] *Id.* at 48.

[28] *Id.* at 28. In the courtroom, the eyewitness can easily see where the defendant is sitting. Thus, in-court identifications do not reliably test an eyewitness' memory. Nevertheless, courts have shown great tolerance of in-court identifications, deeming them based on "independent" memory, and even following suggestive out-of-court procedures. Garrett, *Eyewitnesses and Exclusion, supra.* For example, the New York Court of Appeals ruled that "[e]xcluding evidence of a suggestive showup does not deprive the prosecutor of reliable evidence of guilt. The witness would still be permitted to identify the defendant in court if that identification is based on an independent source." *People v. Adams*, 423 N.E.2d 379, 384 (N.Y. 1981).

law enforcement officials adopt written procedures for eyewitness identifications and regulating the particular procedures to be used.[29] Three more states (Georgia, Nevada, and Rhode Island) have passed statutes recommending further study, tasking a group with developing best practices, or requiring some form of written policy.[30]

State statutes typically assert that a trial judge may consider the failure to follow the prescribed procedures as a factor in assessing admissibility and informing the jury. The statutes rarely require that a trial judge exclude such identification evidence from consideration by the jury. However, some of the more detailed statutes, such as those in Ohio, North Carolina, and West Virginia, require that law enforcement officials use particular practices (e.g., eyewitness instructions, a blind administrator). Other statutes require adherence to model policies or guidelines. Utah requires that lineup procedures be recorded. Some jurisdictions and departments also have voluntarily adopted guidelines or policies regulating eyewitness identifications.[31] Several state courts have issued rulings regulating lineup practices (e.g., New Jersey's Supreme Court has required documentation of identification procedures).[32]

AIDING JURORS IN ASSESSMENT OF EYEWITNESS TESTIMONY

Expert Witness Testimony Regarding Eyewitness Identification

The standards for assessing the admissibility of testimony by expert witnesses have undergone great changes in the past two decades. Before 1993, the *Frye* test allowed scientific expert testimony in federal courts if it met the standard of "general acceptance" in the relevant scientific community.[33] In 1993, the Supreme Court, in *Daubert v. Merrell Dow*

[29]See Conn. Gen. Stat. § 54-1p (West 2012); 725 Ill. Comp. Stat. § 5/107A-5 (West 2003); Md. Code Ann., Pub. Safety § 3-506 (West 2007); N.C. Gen. Stat. § 15A-284.52 (West 2007); Ohio Rev. Code Ann. § 2933.83 (West 2010); Tex. Code Crim. Proc. Ann. art. 38.20 (West 2011); Utah Code Ann. §77-8-4 (West 1980); Va. Code Ann. §19.2-390.02 (West 2005); Va Code Ann. § 9.1-102.54; 13 V.S.A. § 5581; W. Va. Code Ann. § 62-1E-1 (West 2013); Wis. Stat. § 175.50 (West 2005).

[30]GA. H.R. 352, 149th Gen. Assem., Reg. Sess. (April 20, 2007); Nev. Rev. Stat. § 171.1237 (West 2011); R.I. Gen. Laws § 12-1-16 (West 2012); 2010 Leg. Reg. Sess. (Vt. 2010).

[31]See, e.g., John J. Farmer, Jr., Attorney General of the State of New Jersey, "Letter to All County Prosecutors: Attorney General Guidelines for Preparing and Conducting Photo and Live Lineup Identification Procedures" (April 18, 2001), available at: http://www.state.nj.us/lps/dcj/agguide/photoid.pdf; CALEA Standards for Law Enforcement Agencies: 42.2.11 Lineups, available at: http://www.calea.org/content/standards-titles; International Association of Chiefs of Police, Model Policy: Eyewitness Identification (2010).

[32]*State v. Delgado*, 188 N.J. 48, 63-64, 902 A.2d 888 (2006).

[33]*Frye v. United States*, 54 App. D.C. 46, 293 F. 1013 (1923).

Pharmaceuticals, Inc.,[34] ruled that, under Federal Rule of Evidence 702, a "trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable."[35] Judges determine reliability by assessing the scientific foundation of the expert's testimony prior to trial, so that "*evidentiary reliability* will be based upon *scientific validity*."[36] Many states have adopted *Daubert*, and many of those that have not formally adopted *Daubert* have revised their *Frye* test to adopt much of the *Daubert* standard. In turn, Federal Rule of Evidence 702 has been revised to incorporate the holding in *Daubert*.[37] Federal and state courts remain divided on whether expert testimony on eyewitness identifications is admissible under *Daubert* or *Frye*, and on the proper exercise of trial court discretion when deciding whether to admit such expert testimony. Appellate rulings emphasize that a trial judge should use discretion when deciding whether proffered expert evidence satisfies the *Daubert* or *Frye* standards. An increasing number of rulings emphasize the value of presenting expert testimony regarding eyewitness identification. Some courts have held that it can be an abuse of discretion for a trial judge to bar the defense from admitting such testimony.[38] Detailed descriptions of the relevant scientific research findings accompany such decisions.[39] There are also many federal and state courts that continue to follow the traditional approach, emphasizing that credibility of eyewitnesses is a matter within the "province of the jury" and insisting that information regarding valid scientific research in this area will not assist the jury in its task.[40]

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[34]509 U.S. 579 (1993).

[35]*Id.* at 589.

[36]*Id.* at 590 n.9.

[37]Fed. R. Evid. 702. Rule 702 now provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if: (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.

[38]See, e.g., *Tillman v. State*, 354 S.W.3d 425, 441 (Tex. Crim. App. 2011); *People v. LeGrand*, 835 N.Y.S.2d 523, 524 (2007); *State v. Clopten*, 223 P.3d 1103, 1117 (Utah 2009); *U.S. v. Smithers*, 212 F.3d 306, 311–14 (6th Cir. 2000).

[39]See, e.g., *State v. Copeland*, 226 S.W.3d 287, 299–300 (Tenn. 2007); *Tillman*, 354 S.W.3d at 441; *Clopten*, 223 P.3d at 1108.

[40]For scholarly examination of this case law, see, e.g., "The Province of the Jurist: Judicial Resistance to Expert Testimony on Eyewitnesses as Institutional Rivalry," *Harvard Law Review* 126(8): 2381 (2013); R. Simmons, "Conquering the Province of the Jury: Expert Testimony and the Professionalization of Fact-Finding," *University of Cincinnati Law Review* 74: 1013 (2006); G. Vallas, "A Survey of Federal and State Standards for the Admission of Expert Testimony on the Reliability of Eyewitnesses," *American Journal of Criminal Law* 39(1): 97 (2011).

The trend is toward greater acceptance of expert testimony regarding the factors that may affect eyewitness identification. In a 2012 decision, the Connecticut Supreme Court disavowed earlier rulings restricting expert testimony and stated that such rulings are now "out of step with the widespread judicial recognition that eyewitness identifications are potentially unreliable in a variety of ways unknown to the average juror."[41] Similarly, the Pennsylvania Supreme Court recently held that expert testimony on eyewitness identifications was no longer *per se* inadmissible, emphasizing that "courts in 44 states and the District of Columbia have permitted such testimony at the discretion of the trial judge," and that "all federal circuits that have considered the issue, with the possible exception of the 11th Circuit, have embraced this approach."[42] As the Seventh Circuit Court of Appeals recently explained:

> It will not do to reply that jurors know from their daily lives that memory is fallible. The question that social science can address is how fallible, and thus how deeply any given identification should be discounted. That jurors have beliefs about this does not make expert evidence irrelevant; to the contrary, it may make such evidence vital, for if jurors' beliefs are mistaken then they may reach incorrect conclusions. Expert evidence can help jurors evaluate whether their beliefs about the reliability of eyewitness testimony are correct.[43]

Courts also have allowed expert witnesses to testify about particular issues concerning eyewitness identifications, such as cross-race effects, stress, weapons focus, suggestive lineup procedures, and the like.[44] Rarely have experts conducted eyewitness identification research related to the specific case before the court. However, in one such case, in which an experiment

[41] *State v. Guilbert*, 306 Conn. 218, 234 (Conn. 2012). Prior to that decision, the Connecticut Supreme Court had long ruled that "the reliability of eyewitness identification is within the knowledge of jurors and expert testimony generally would not assist them in determining the question" (*State v. Kemp, supra* 199 Conn. at 473, 477), and that factors affecting eyewitness memory are "nothing outside the common experience of mankind" (*State v. McClendon, supra* 248 Conn. at 572, 586).

[42] *Com. v. Walker*, 2014 WL 2208139 *13 (Pa. 2014) (collecting authorities).

[43] *U.S. v. Bartless*, 567 F.3d 901, 906 (7th Cir. 2009). Other federal courts have found it a proper exercise of discretion to exclude expert testimony on eyewitness identifications. See, e.g., *United States v. Lumpkin*, 192 F.3d 280, 289 (2d Cir. 1999). Most federal courts treat the subject as one of considerable trial discretion; see, e.g., *United States v. Rodriguez-Berrios*, 573 F.3d 55, 71–72 (1st Cir. 2006). For a survey of federal decisions, see Lauren Tallent, Note, *Through the Lens of Federal Evidence Rule 403: An Examination of Eyewitness Identification Expert Testimony Admissibility in the Federal Circuit Courts*, Washington & Lee Law Review 68 (2): 765 (2011); see also Walker, 2014 2208139 *13.

[44] See, e.g., *Loftus, Doyle & Dysart* at § 14-8[a]-[b] p. 408 n. 41–42, 410, n. 53 (5th Edition, 2013) (collecting cases).

was conducted with the actual photo array used in the case, the federal courts found expert testimony admissible where it was directed not only to general research, but also by the question of whether suggestive procedures affected the identification in that case.[45]

Expert witnesses who explain the complications of eyewitness identification can be expensive. Most criminal defendants are indigent and cannot afford such assistance.[46] In *Ake v. Oklahoma,* the Supreme Court held that an indigent defendant has a constitutional due process right to assistance by an expert witness only if that expert assistance is so crucial to the defense (or such a "significant factor") that its denial would deprive the defendant of a fundamentally fair trial.[47] In federal courts, funding for expert witnesses is available, and requests by indigent defendants are common.[48] In state courts, such assistance is uncommon, especially in state courts that rarely find denial of expert assistance on eyewitness matters to be a due process violation.

Expert testimony on eyewitness memory and identifications has many advantages over jury instructions as a method to explain relevant scientific framework evidence to the jury: (1) Expert witnesses can explain scientific research in a more flexible manner, by presenting only the relevant research to the jury; (2) Expert witnesses are familiar with the research and can describe it in detail; (3) Expert witnesses can convey the state of the research at the time of the trial; (4) Expert witnesses can be cross-examined by the other side; and (5) Expert witnesses can more clearly describe the limitations of the research. The benefits of expert testimony are offset somewhat by the expense. However, conflicting testimony by opposing experts may lead to confusion among the jurors. Nonetheless, trial judges have discretion to determine whether the potential benefits of expert testimony outweigh the cost.

Jury Instructions Regarding Eyewitness Identification

Some courts restricting expert testimony have found jury instructions regarding the fallible nature of eyewitness identifications to be an acceptable substitute for expert testimony.[49] At the conclusion of a criminal trial,

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[45]*Newsome v. McCabe,* 319 F.3d 301 (7th Cir. 2003).

[46]See, e.g., Bureau of Justice Statistics, "Indigent Defense," available at: http://www.bjs.gov/index.cfm?ty=pbdetail&iid=995.

[47]470 U.S. 68, 82–83 (1985). Even if an indigent defendant receives funding to retain an expert, the judge may ultimately decide that the expert testimony is not admissible at trial.

[48]18 U.S.C. § 3006A(e)(1).

[49]See, e.g., *U.S. v. Jones,* 689 F.3d 12, 20 (1st Cir. 2012) ("The judge was fully entitled to conclude that this general information could be more reliably and efficiently conveyed by instructions rather than through dueling experts.").

the trial judge can instruct jurors on the factors that may result in an erroneous identification while also offering instructions on the legal principles jurors must apply when assessing the factual record. Such instructions may be given when the witness testifies. Judges tend to rely on model or pattern instructions, because any departure from these standard instructions may be a ground for appellate reversal.

The New Jersey Supreme Court viewed jury instructions as preferable to expert testimony.[50] The New Jersey instructions adopted, following the *Henderson* decision, are by far the most detailed set of jury instructions regarding eyewitness identification evidence. Traditionally, instructions regarding eyewitness identifications have been brief and remind the jurors to consider the following: (1) the credibility of an eyewitness is like that of any other witness and (2) any eyewitness identification is part of the prosecutor's burden of proof in a criminal case.[51] Many state courts have held that, although general jury instructions regarding credibility and the burden of proof are appropriate, more specific instructions on eyewitness identifications are considered an inappropriate judicial comment on the evidence.[52] Following the U.S. Supreme Court's decision in *Manson v. Brathwaite,* some state courts supplemented their jury instructions by including the five reliability factors named by the Supreme Court.[53]

In 1972, in *U.S. v. Telfaire,* the D.C. Circuit Court of Appeals adopted a set of influential model jury instructions to be used in appropriate federal cases involving eyewitness identifications.[54] The instructions emphasized the following:

> You must consider the credibility of each identification witness in the same way as any other witness, consider whether he is truthful, and consider

[50]The New Jersey Supreme Court indicated: "Jury charges offer a number of advantages: they are focused and concise, authoritative (in that juries hear them from the trial judge, not a witness called by one side), and cost-free; they avoid possible confusion to jurors created by dueling experts; and they eliminate the risk of an expert invading the jury's role or opining on an eyewitness' credibility." *Henderson,* 27 A.3d at 925.

[51]New Jersey courts used such instructions a decade before *Henderson.* See, e.g., *State v. Robinson,* 165 N.J. 32, 46–47 (N.J. 2000). Some states have also approved instructions informing the jury that there may be an "independent source" for an in-court identification. See, e.g., *State v. Cannon,* 713 P.2d 273, 281 (Ariz. 1985).

[52]*Brodes v. State,* 279 Ga. 435, 439 & n.6 (Ga. 2005) (surveying state case law).

[53]*State v. Tatum,* 219 Conn. 721 (1991).

[54]*U.S. v. Telfaire,* 469 F.2d 552, 558 (D.C. Cir. 1972). Some federal courts follow that approach, while others adopt a "flexible approach." See, e.g., *United States v. Luis,* 835 F.2d 37, 41 (2d Cir. 1987). Some more recent federal model instructions include added detail, reflecting variables such as stress and cross-race identifications. See, e.g., Third Circuit Model Criminal Jury Instructions, 4.15 (Jan. 2014), available at: http://www.ca3.uscourts.gov/sites/ca3/files/2013%20Chapter%204%20final%20revised.pdf.

whether he had the capacity and opportunity to make a reliable observation on the matter covered in his testimony.[55]

The *Telfaire* instructions departed from the brief traditional instruction by adding that the jury should consider factors related to the initial sighting, including "how long or short a time was available, how far or close the witness was, how good were lighting conditions, [and] whether the witness had had occasion to see or know the person in the past." The decision also noted that an identification is more reliable if the witness is able to pick the defendant out of a group, rather than at a showup, and that the jury should consider the length of time between the crime and the identification.[56]

Some states have adopted cautionary instructions on specific issues related to eyewitness identification evidence. In *State v. Ledbetter*, the Connecticut Supreme Court ordered lower courts to use a special instruction in cases in which law enforcement failed to instruct the eyewitness that the perpetrator may or may not be present in a lineup.[57] The Georgia Supreme Court concluded in 2005 that one particular use of the *Manson v. Brathwaite* factors must no longer be permitted: "we can no longer endorse an instruction authorizing jurors to consider the witness' certainty in his/her identification as a factor to be used in deciding the reliability of that identification."[58] Other courts have done the same.[59] In 1999, the New Jersey Supreme Court ruled in *State v. Cromedy* that instructions on cross-racial identifications are required in certain cases.[60]

Expert testimony on eyewitness memory and identifications appears to have many advantages when used as a method to explain relevant scientific framework evidence to the jury. However, when expert testimony is not available to the defense, jury instructions may be a preferable alternative means to inform the jury of the findings of scientific research in this area.

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[55] *U.S. v. Telfaire*, 469 F.2d at 559.

[56] *Id.* at 558.

[57] *State v. Ledbetter*, 275 Conn. 534, 579–580 (2005) (The instruction reads, in part, "the individual conducting the procedure either indicated to the witness that a suspect was present in the procedure or failed to warn the witness that the perpetrator may or may not be in the procedure. Psychological studies have shown that indicating to a witness that a suspect is present in an identification procedure or failing to warn the witness that the perpetrator may or may not be in the procedure increases the likelihood that the witness will select one of the individuals in the procedure, even when the perpetrator is not present. Thus, such behavior on the part of the procedure administrator tends to increase the probability of a misidentification.")

[58] *Brodes*, 279 Ga. at 442.

[59] See, e.g., *supra Commonwealth v. Payne*, 426 Mass. 692 (1998); *State v. Romero*, 191 N.J. 59 (2007).

[60] *State v. Cromedy*, 158 N.J. 112 (1999); see also Innocence Project, "Know the Cases: McKinley Cromedy," available at: http://www.innocenceproject.org/Content/McKinley_Cromedy.php.

Brief instructions may not, however, provide sufficient guidance to explain the relevant scientific evidence to the jury, but lengthy instructions may be cumbersome and complex.

More research is warranted to better understand how best to communicate to jurors the factors that may affect the validity of eyewitness testimony and support a more sensitive discrimination of the strengths and weaknesses of eyewitness testimony in individual cases. Indeed, research findings on the effectiveness of jury instructions on assessment of eyewitness identification evidence have been mixed. In general, such studies find that jury instructions cause jurors to become more suspicious of all eyewitness identification evidence.[61] A recent study of the effect of the New Jersey jury instructions used in *Henderson* found that the instructions reduced juror reliance on *both* strong and weak eyewitness identification evidence.[62] Among the few studies finding that jury instructions succeed in increasing jurors' sensitivity to the strength of such evidence are those that study the effect of jury instructions presented before the eyewitness testimony rather than at the end of the case before deliberation.[63] Such studies also have examined instructions that use visual aids rather than rely on a judge's recitation of written instructions.[64] In addition, research studies might explore the use of videotape as an alternative way to present such information[65] and the effects of moving jury instructions to precede the introduction of the testimony by the eyewitness.

[61]For a review of this research, see K. A. Martire and R. I. Kemp, "The Impact of Eyewitness Expert Evidence and Judicial Instruction on Juror Ability to Evaluate Eyewitness Testimony," *Law and Human Behavior* 33:225–236, 226 (reviewing studies of jury instructions on eyewitness identification and concluding that increased skepticism and confusion is a common result); see also J. L. Devenport, C. D. Kimbrough, and B. L. Cutler, "Effectiveness of traditional safeguards against erroneous conviction arising from mistaken eyewitness identification," in *Expert testimony on the psychology of eyewitness identification*, ed. B. L. Cutler (New York: Oxford University Press, 2009), 51–68 (summarizing research studying the *Telfair* jury instruction and concluding that "cautionary jury instructions may be an ineffective safeguard against erroneous convictions resulting from mistaken eyewitness identifications.").

[62]A. P. Papailiou, D. V. Yokum, C. T. Robertson, "The Novel New Jersey Eyewitness Instruction Induces Skepticism But Not Sensitivity," August 2014, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2475217.

[63]See, e.g., N. B. Pawlenko, M. A. Safer, R. A. Wise, and B. Holfeld, "A Teaching Aid for Improving Jurors' Assessments of Eyewitness Accuracy," *Applied Cognitive Psychology* 27(2): 190–197. Other studies are reviewed in Martire and Kemp, *supra* note 105 at 226.

[64]Pawlenko et al., *supra* note 107.

[65]For an example of videotaped instructions, see Federal Judicial Center, *The Patent Process: An Overview for Jurors*, available at: *http://www.youtube.com/watch?v=ax7QHQTbKQE*.

CONCLUSION

The *Manson v. Brathwaite* test under the Due Process Clause of the U.S. Constitution set out the modern test that regulates the fairness and the reliability of eyewitness identification evidence. The test evaluates the "reliability" of eyewitness identifications using factors derived from prior rulings and not from empirically validated sources. It includes factors that are not diagnostic of reliability and treats factors such as the confidence of a witness as independent markers of reliability when, in fact, it is now well established that confidence judgments may vary over time and can be powerfully swayed by many factors. The best guidance for legal regulation of eyewitness identification evidence comes not, however, from constitutional rulings, but from the careful use and understanding of scientific evidence to guide fact-finders and decision makers.

4

Basic Research on Vision and Memory

Accurate eyewitness identification requires that a witness to a crime correctly sense, perceive, and remember objects and events that occurred and recall them later. The veracity of the witness' identification thus depends on the limits of sensation, perception, and memory. Recent scientific studies have yielded great advances in our understanding of how vision and memory work. This chapter provides a brief overview of current knowledge, identifies areas in which vision and memory are imperfect, and describes implications for the accuracy of eyewitness identification. These implications, in turn, have guided much of the applied research on this topic (see Chapter 5) and provide a general framework for the recommendations made herein (see Chapter 6).

VISION AND MEMORY IN CONTEXT

This chapter begins by offering a concrete example to place the body of basic scientific research on vision and memory in context so as to better communicate its relevance to eyewitness identification. In the sections that follow the example, the different functional steps of the sequence (highlighted in italics) are dissected in some detail, with special reference to its limitations and the ways in which it may fail to deliver accurate eyewitness identification.

> While returning home late, you hear a muffled scream from around the street corner. Seconds later, you come face-to-face with a man turning the corner and moving swiftly past you. Instantaneously, properties of the

scene are conveyed to you through patterns of light cast on the backs of your eyes and *sensed by photoreceptors* in your retina. Only a fraction of the information sensed is selected for further processing; in this case you *focus your attention* on certain features of the man's face. Those features are *integrated and interpreted to yield a coherent percept* of the man. As you round the corner, you perceive, through an identical process, the victim slumped lifelessly against a wall. You quickly grasp the meaning of these perceptual experiences, and they immediately elicit both cognitive and visceral components (e.g., increased heart rate) of fear and anxiety. Your percepts are initially *encoded in short-term working memory*, where content is limited and labile. Your elevated level of arousal may cause interference and some loss of content, but with time and recognition of the importance of the experience, your percepts are *consolidated into long-term memory*. Long-term memories are *maintained in storage* but subject to ongoing updates and modifications resulting from new experiences and perhaps distortions caused by sustained levels of stress.

At a later date, you are asked to look at a police lineup that includes a suspect apprehended near the crime scene. Visual features of the men in the lineup are *sensed*, *selectively attended*, and *perceived*, using the same visual processes engaged on the night in question. Some of these features—the high brow and sharp cheekbones of one man in the lineup—*elicit retrieval* of memories of your visual experiences on the night of the crime. The simultaneously perceived and retrieved experiences are implicitly compared, leading to a cycle of greater visual scrutiny of the man in front of you and retrieval of additional details of the original percept. The context of the lineup procedure, the sight of the man, and the retrieved memories trigger latent emotions and anxiety, which may interfere with your comparison of percept and memory. Eventually, the comparison reaches your internal criterion for identification: You decide, with an implicit level of certainty, that your current visual percept and the percept from the night of the crime were caused by the same external source (the man now in front of you), and you assert that you have *identified the person you witnessed at the crime scene*.

VISION

Functional Processes of Vision

To understand the contributions and limitations of vision to eyewitness identification, it is useful to consider the workings of three functional stages of visual processing—sensation, attention, and perception—bearing in mind that they comprise highly interdependent elements of a continuous operation. *Sensation* is the initial process of detecting light and extracting basic image features. Sensations themselves are evanescent, and only a small

fraction of what is sensed is actually perceived. *Attention* is the process by which information sensed by the visual system is selected for further processing. *Perception* is the process by which attended visual information is integrated, linked to environmental cause, made coherent, and categorized through the assignment of meaning, utility, value, and emotional valence. In addition, memories and emotions resulting from prior experiences with the world can influence all stages of visual processing and thus define a thread that weaves throughout the following discussions.

All of the functional processes of vision are beset by noise, which affects the quality and types of information accessible from the visual environment, and bears heavily on the validity of eyewitness identification. Before considering the processes of sensation, attention, and perception in greater detail, consideration is given to the concept of noise in visual processing and to ways of interpreting its impact on visual experience.

The Fundamental Role of Noise

Vision is usefully understood as the process of detecting informative signals about the external world and using those signals to recognize objects, make decisions, and guide behavior. As with any signal detection, there are occasionally factors that lead to uncertainty on the part of the observer about whether a particular signal is present. These factors are generically termed *noise*, following the definition used in electronic signal transmission, in which noise refers to random or irrelevant elements that interfere with detection of coherent and informative signals. In vision, noise comes from a variety of sources, some associated with the structure of the visual environment (e.g., occluding surfaces, glare, shadows), some inherent to the optical and neuronal processes involved (e.g., scattering of light in the eye), some reflecting sensory content not relevant to the observer's goals (e.g., a distracting sign or a loud sound), and some originating with incorrect expectations derived from memory. Consider, for example, the seemingly simple problem of detecting a green light while waiting at a traffic signal. In this case, your ability to "see" the green light may be compromised by glare or dust on your windshield, by poor visual acuity, by your eyes having been aimed instead at the driver of the adjacent car, by the presence of other (irrelevant) colored lights in your field of view (e.g., a traffic signal at a different intersection or the lights of a nearby restaurant), by a cell phone conversation, or by the news on the car radio. The significance of this view for eyewitness identification is profound, as it helps us to realize that the accuracy of information about the environment—the face

of a criminal, for example—gained through vision is necessarily, and often sharply, limited by noise.[1]

The fact that vision is noise-limited suggests a familiar statistical framework—signal detection theory—for assessing and understanding the effects of noise on visual perception and recognition ability.[2] Signal detection theory has long been successfully applied to analogous problems in electronic signal reception.[3] To illustrate these principles as applied to sensory processing, consider the problem of detecting a vibrating cell phone in your pocket. Anyone who has operated a cell phone in vibrate mode will be familiar with two types of signal detection errors: (1) the occasional sense that the phone is vibrating in your pocket, only to discover that it is not, and, conversely, (2) the phone call that is sometimes missed because you attribute the vibration to some other cause. *Signal*, in this example, is a subtle tactile stimulus resulting from an incoming phone call. *Noise*, in this example, is all of the other things in your environment that may also lead to subtle tactile stimulation, such as vibration of your car seat, a shift of keys in your pocket, or the touch of another person.

Signal detection theory posits that there are three main factors that determine whether a signal will be detected: (1) the distribution of stimuli (e.g., the variety of stimulus magnitudes) that reflect noise only, (2) the distribution of stimuli that reflect signal, and (3) the observer's criterion for "deciding" that a specific stimulus resulted from noise sources or signal. An important factor for the fidelity of signal detection is the degree to which noise and signal distributions overlap with one another. In the case of the vibrating cell phone, if the distributions of tactile stimuli resulting from noise and signal overlap, as is often the case, then there will always be some cases in which you believe the phone is vibrating when it is not (noise stimuli attributed to signal source), and there will be some cases in which the phone is vibrating and you miss the call (signal stimuli attributed to noise source).

The third factor that influences signal detection in the presence of noise is the observer's decision criterion, which is simply the value (e.g., stimulus amplitude) above which a stimulus is attributed to signal, and below which a stimulus is attributed to noise. In the same sense that your car radio is programmed to "decide" (and allow you to hear) when informative patterns of electromagnetic radiation (signal) are sufficiently different from random fluctuations (noise), an observer adopts a criterion for deciding whether a

[1] W. S. Geisler, "Sequential Ideal-Observer Analysis of Visual Discriminations," *Psychological Review* 96(2): 267–314 (1989).

[2] D. M. Green and J. A. Swets, *Signal Detection Theory and Psychophysics* (New York: Wiley, 1966).

[3] W. W. Peterson, T. G. Birdsall, and W. C. Fox, "The Theory of Signal Detectability," *Proceedings of the IRE Professional Group on Information Theory* 4(4): 171–212 (1954).

stimulus is caused by a signal or is simply a manifestation of noise. This criterion reflects the level of precision acceptable for the observer's needs, given uncertainty about whether a given stimulus reflects a real signal.

In practice, the criterion[4] used is determined by a host of factors unique to the circumstances, including psychological and social demands and behavioral goals. These factors collectively determine the relative "costs" of incorrect attributions of signal as noise ("misses") and of noise as signal ("false alarms").

If an individual places high value on not missing a phone call, then she or he will adopt a very *liberal* criterion, in which all stimuli reflecting real incoming calls (signal) are successfully detected, but many noise stimuli (e.g., shifting keys in a pocket) are erroneously (and frustratingly) believed to be incoming calls. By contrast, if an individual places little value on detecting incoming phone calls, she or he will adopt a *conservative* criterion, in which many calls are missed and noise stimuli rarely elicit an effort to answer the phone, which may be of value to the individual who wishes to avoid distraction.

The example of the signal detection logic used for the vibrating cell phone applies similarly to all aspects of visual perceptual experience, including the conditions of witnessing criminal events. The uncertainty about visual events caused by manifold sources of noise will inevitably lead to inaccurate visual perceptual experiences, which result from conditions in which an observer fails to detect a critically informative stimulus as "real" (attributing the stimulus instead to a source of noise) or confidently perceives a noise stimulus to have originated from an informative source. The latter instance is problematic because it increases the likelihood that observers will unwittingly "construct," on the basis of expectations derived from memory and situational context, perceptual experiences to account for noise erroneously interpreted as signal.

What follows from this consideration of uncertainty and decision criteria for visual perception is that the actual impact of factors that limit the amount of visual information available to an eyewitness (factors considered in more detail below) will depend on the criterion adopted. The criterion may reflect the values and prejudices of the eyewitness, his or her motivational and emotional state, and a variety of behavioral goals. In principle, the observer's criterion can be altered by instruction or incentives, but it is important to note that the criterion held by an observer witnessing a crime scene cannot be anticipated, nor can it be altered after the fact. It is an "estimator variable," which simply needs to be recognized and understood when evaluating eyewitness reports. By contrast, the decision criterion held

[4]The criterion is sometimes referred to as bias.

by an observer at the time of identification can be controlled, and there may be valid reasons for doing so (see Chapter 5).[5]

In the following discussions of sensation, attention, and perception, the various means and conditions under which many different types of noise introduce uncertainty in visual signal detection (and thus fundamentally limit the accuracy of eyewitness identification) are addressed.

Visual Sensation

When an observer views an object of any sort (such as a person) or events involving the object (a criminal act), patterns of light reflected from the environment are focused by the lens at the front of the eye and projected onto the back surface of the eye (the retina) to form the retinal image. Light in the image is initially "sensed" by the activation of photoreceptors, and early stages of sensory processing function to detect spatial and temporal contrast along a number of dimensions, including intensity and wavelength of light.[6] These contrast measurements are integrated by subsequent processing stages in the brain to yield representations of basic image features, or primitives, such as oriented image contours.[7]

Several sources of noise, or factors that limit the ratio of signal to noise, can restrict the visual information accessible to these early sensory processes. Some factors are inherent to the visual system and largely uncontrollable (e.g., the scattering of light by the fluid and tissues of the eye) and can be exacerbated by common observer-specific visual deficits (e.g., myopia, poor contrast sensitivity, or color blindness). Others factors are dependent on viewing conditions (e.g., the effects of viewing time and level of illumination).[8] Both of these types of factors predictably influence the quantity of information—the visual signal strength—that a viewer gains from a visual scene, and thus the degree to which the perceptual experi-

[5]L. Mickes, H. D. Flowe, and J. T. Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory: Comparing the Diagnostic Accuracy of Simultaneous and Sequential Lineups," *Journal of Experimental Psychology: Applied* 18(4): 361–376 (2012).

[6]M. Meister and M. Tessier-Lavigne, "Low-level Visual Processing: The Retina," in *Principles of Neuroscience,* 5th Edition, ed. E. Kandel, J. H. Schwartz, T. M. Jessell, S. A. Siegelbaum, and A. J. Hudspeth (New York: McGraw-Hill Professional, 2012), 577–601.

[7]C. D. Gilbert, "Intermediate-level Visual Processing and Visual Primitives," in *Principles of Neuroscience,* 5th Edition, ed. E. Kandel, J. H. Schwartz, T. M. Jessell, S. A. Siegelbaum, and A. J. Hudspeth (New York: McGraw-Hill Professional, 2012), 602–620.

[8]D. G. Pelli, "Uncertainty Explains Many Aspects of Visual Contrast Detection and Discrimination" *Journal of the Optical Society of America* A2(9): 1508–32 (1985). D. G. Pelli, "The Quantum Efficiency of Vision," in *Vision: Coding and Efficiency,* ed. C. Blakemore (Cambridge: Cambridge University Press, 1990), 3–24. G. Sperling, "The Information Available in Brief Visual Presentations," *Psychological Monographs: General and Applied* 74(11, Whole No. 498): 1–29 (1960).

ence can accurately reflect the properties of the external world.[9] At the extreme, short viewing times and low levels of illumination simply reduce the number of correlated photons reaching the retina to the point where they scarcely exceed photon noise, and uncertainty is very high.[10] At slightly longer viewing times and greater illumination levels, signal-to-noise levels improve, but there may remain marked limits on visual sensitivity. Visual acuity, for example, which is a measure of the ability to resolve the fine spatial details of a visual pattern, is known to decline significantly with decreases in illumination.[11]

Signal-to-noise loss can depend on the direction of the observer's gaze. Visual acuity is highest at the observer's center of gaze. The center is the part of your visual system that is used for fine sensing, such as reading or scrutinizing faces in a social context. Acuity drops off markedly with angular distance from this center, such that the quality and quantity of information sensed a mere 10 degrees from center are far less than what is available at the center of gaze.[12]

Under unrestricted viewing conditions, the movements of the eyes largely overcome the effects of gaze direction. However, under the viewing conditions associated with a typical crime, this source of noise may place severe limitations on the ability of the observer to sense key pieces of information that are not present at the center of gaze. To appreciate the impact of these limitations, consider that patients with macular degeneration are effectively blinded in the region of the visual field possessing highest acuity, and must rely instead on the much-reduced quality of visual information gained from the peripheral visual field. To compensate for this clinical loss, images and text must be greatly magnified to enable comprehension—an option that is clearly not available to an eyewitness.

Visual Attention

Light falling on all parts of the retina is available to be sensed—and *must* be sensed for it to be available for further processing—but only a

[9]G. Sperling, "A Signal-to-Noise Theory of the Effects of Luminance on Picture Memory: Comment on Loftus," *Journal of Experimental Psychology: General* 115(2): 189–192 (1986).

[10]S. Hecht, S. Schlaer, and M. H. Pirenne, "Energy, Quanta, and Vision," *Journal of General Physiology* 25(6): 819–840 (1942).

[11]P. W. Cobb, "The Influence of Illumination of the Eye on Visual Acuity," *American Journal of Physiology* 29: 76–99 (1911). S. Hecht, "A Quantitative Basis for the Relation Between Visual Acuity and Illumination," *Proceedings of the National Academy of Sciences* 13: 569–574 (1927). S. Shlaer, "The Relation Between Visual Acuity and Illumination," *Journal of General Physiology* 21 (2): 165–188 (1937).

[12]H. Strasburger, I. Rentschler, and M. Jüttner, "Peripheral Vision and Pattern Recognition: A Review," *Journal of Vision* 11(5):13, 1–82 (2011).

small fraction of the information sensed reaches awareness or is used by the observer for recognition, action, or storage in memory. This limited access to visual sensory information is a product of selective attention.[13] Attention is an active process that can be directed by external factors—visual attributes with high salience, such as a bright light or an unfamiliar object—or by internal control.[14] If you are searching for a coffee cup, for example, you may explicitly direct your attention to the table where it was last seen. Attention can be directed to different types of image content, including specific locations in space,[15] specific image features (such as a specific color),[16] or to specific objects (such as the coffee cup).[17]

Attended image content is transiently enhanced to increase the fidelity of visual experience.[18] Attention interacts with sensory processing, for example, by selectively enhancing contrast[19] and potentially overcoming low signal-to-noise levels resulting from limited viewing time or illumination.[20] The effects of attention on contrast enhancement can be potentiated further when attention is commanded by emotionally laden stimuli.[21] Image con-

[13]W. James, *Principles of Psychology* (New York: Henry Holt, 1890); H. Pashler, J. Johnston, and E. Ruthruff, "Attention and Performance," *Annual Review of Psychology* 52: 629–651 (2001).

[14]M. I. Posner, "Orienting of Attention," *Quarterly Journal of Experimental Psychology* 32: 3–25 (1980).

[15]Ibid.

[16]A. F. Rossi and M. A. Paradiso, "Feature-specific Effects of Selective Visual Attention," *Vision Research* 35(5): 621–634 (1995).

[17]J. Duncan, "Selective Attention and the Organization of Visual Information," *Journal of Experimental Psychology: General* 113(4): 501–517 (1984).

[18]H. Pashler, J. Johnston, and E. Ruthruff, "Attention and Performance," *Annual Review of Psychology* 52: 629–651 (2001).

[19]M. Carrasco et al.,"Attention Alters Appearance" *Nature Neuroscience* 7: 308–313 (2004).

[20]M. I. Posner, C. R. Snyder, and B. J. Davidson, "Attention and the Detection of Signals," *Journal of Experimental Psychology* 109(2): 160–174 (1980). M. Carrasco and B. McElree, "Covert Attention Accelerates the Rate of Visual Information Processing," *Proceedings of the National Academies of Science* 98(9): 5363–5367 (2001). Y. Yeshurun and M. Carrasco, "Attention Improves or Impairs Visual Performance by Enhancing Spatial Resolution," *Nature* 396, 72–75 (1998). M. Carrasco et al., "Covert Attention Increases Spatial Resolution with or without Masks: Support for Signal Enhancement," *Journal of Vision* 2(6): 467–79 (2002). E. Blaser et al., "Measuring the Amplification of Attention," *Proceedings of the National Academies of Science* 96(20): 11681–11686 (1999). K. Anton-Erxleben and M. Carrasco, "Attentional Enhancement of Spatial Resolution: Linking Behavioural and Neurophysiological Evidence," *Nature Reviews Neuroscience* 14(3):188–200 (2013). J. W. Couperus and G. R. Mangun, "Signal Enhancement and Suppression During Visual-Spatial Selective Attention," *Brain Research* 1359:155–177 (2010).

[21]E. A. Phelps, S. Ling, and M. Carrasco, "Emotion Facilitates Perception and Potentiates: The Perceptual Benefits of Attention," *Psychological Science* 17(4): 292 (2006).

tent *not* falling within the focus of attention is processed with less fidelity.[22] In some cases, unattended content is effectively invisible: It does not reach awareness, it is not perceived, and it is not available for use in guiding decisions or actions, or for storage in memory.[23]

Different pieces of visual information compete for selection,[24] as their attributes of physical salience, location in space, novelty, and relevance to the observer's needs and behavioral goals are always changing.[25] The outcome of the competition is highly susceptible to noise (in this instance, noise is defined as uncontrolled factors that bias the focus of attention and create uncertainty about the content of a visual scene), because the informational content of the visual image vastly exceeds what can be attended at any point in time. The implications of such noise for eyewitness identification are profound. An observer must "select" what to attend to, often within a short window of time, without advance warning, in the presence of many novel objects and events, and under such confounding influences as anxiety and fear.

The signal detection framework is readily adaptable to the problem of noise in visual attention and provides some insights into the limits of attentional selection in the presence of noise.[26] In essence, this signal detection approach quantifies the extent to which multiple items competing with one another for attention affect attentional enhancement for any one of the items.[27] Reductions in efficiency are common under such noise conditions. Indeed, sensitivity to unattended items can be markedly reduced under conditions of high "perceptual load," in which there are many objects si-

[22]Posner, Snyder, and Davidson, "Attention and the Detection of Signals." Y. Yeshurun and M Carrasco, "Attention Improves or Impairs Visual Performance by Enhancing Spatial Resolution," *Nature* 396: 72–75 (November 1998).

[23]A. Mack and I. Rock, *Inattentional Blindness* (Cambridge, MA: MIT Press, 1998).

[24]R. Desimone and J. Duncan, "Neural Mechanism of Selective Visual Attention," *Annual Review of Neuroscience* 18: 193–222 (March 1995).

[25]J. M. Wolfe and T. S. Horowitz, "What Attributes Guide the Deployment of Visual Attention and How Do They Do It?" *Nature Reviews Neuroscience* 5: 495–501 (June 2004). H. E. Egeth and S.Yantis, "Visual Attention: Control, Representation, and Time Course," *Annual Review of Psychology* 48(1): 269–297 (February 1997). M. I. Posner, "Orienting in Attention," *Quarterly Journal of Experimental Psychology* 32(1): 3–25 (1980). A. Treisman and G. Gelade, "A Feature Integration Theory of Attention," *Cognitive Psychology* 12(1):97–136 (January 1980). L. Itti and C. Koch, "A Saliency-based Search Mechanism for Overt and Covert Shifts of Visual Attention," *Vision Research* 40(10–12): 1489–1506 (June 2000).

[26]G. Sperling and M. J. Melchner, "The Attention Operating Characteristic: Examples from Visual Search," *Science* 202(4365): 315–318 (October 1978). G. Sperling and B. A. Dosher, "Strategy and Optimization in Human Information Processing," in *Handbook of Perception and Human Performance*, ed. K. Boff, L. Kaufman, and J. Thomas (New York: Wiley, 1986).

[27]Ibid.

multaneously competing for attention.[28] The spacing of items in the visual field also impacts visual sensitivity.[29] When objects are closely spaced, their discriminability is reduced. One explanation offered for this "crowding effect" is that the spacing of visual items is smaller than the resolution of visual attention.[30] The visual phenomenon of crowding suggests that a crime committed in a visually complex scene, such as a sporting event, could easily place limits on the ability of a witness to accurately perceive the facial features of a perpetrator.

A related consequence of attentional noise is that competing interests can readily hijack the attentional focus. The technique of *misdirection*—one of the original mainstays of performance magic—directs attention to uninformative image content and exploits the invisibility of unattended features.[31] The well-studied *inattentional blindness* effect is another example of this phenomenon, in which attention that is pre-directed to one behaviorally significant property of a visual scene precludes awareness of other features that also may be important.[32] (For a dramatic demonstration of this effect, produced by Simons and Chabris,[33] see http://tinyurl.com/inattentional-blindness.)

Inattentional blindness effects translate well to real-world interactions between people. An individual can be surprisingly unaware of surreptitious changes to the physical appearance of another person while engaged in conversation.[34] One demonstration of this phenomenon involved two strangers (experimenter and pedestrian) in a brief face-to-face conversation on a sidewalk. At some point in the conversation an opaque door was carried between the two individuals, and another person with different appearance, clothing, and voice quickly replaced the experimenter. More than half of

[28]N. Lavie, "Perceptual Load as a Necessary Condition for Selective Attention," *Journal of Experimental Psychology: Human Perception and Performance* 21(3): 451–468 (June 1995). J. W. Couperus, "Perceptual Load Influences Selective Attention Across Development," *Developmental Psychology* 47(5):1431–1439 (September 2011).

[29]D. M. Levi, "Crowding—An Essential Bottleneck for Object Recognition: A Mini-review," *Vision Research* 48: 635–654 (2008).

[30]J. Intriligator and P. Cavanagh, "The Spatial Resolution of Visual Attention," *Cognitive Psychology* 43: 171–216 (2001).

[31]G. Kuhn et al., "Misdirection in Magic: Implications for the Relationship Between Eye Gaze and Attention," *Visual Cognition* 16(2–3): 391–405 (2008). S. L. Macknik, S. Martinez-Conde, and S. Blakeslee, *Sleights of Mind: What the Neuroscience of Magic Reveals About Our Everyday Deceptions* (New York: Henry Holt and Co., 2010).

[32]A. Mack and I. Rock, *Inattentional Blindness* (Cambridge, MA: MIT Press, 1998). U. Neisser and R. Becklen, "Selective Looking: Attending to Visually Specified Events," *Cognitive Psychology* 7(4): 480–494 (October 1975). D. Simons, "Attentional Capture and Inattentional Blindness," *Trends in Cognitive Sciences* 4(4): 147–155 (April 2000).

[33]D. J. Simons and C. F. Chabris, "Gorillas in Our Midst: Sustained Inattentional Blindness for Dynamic Events," *Perception* 28: 1059–1074 (1999).

[34]D. J. Simons and D. T. Levin, "Failure to Detect Changes to People During a Real-World Interaction," *Psychonomic Bulletin and Review* 5(4): 644–649 (1998).

the participants (pedestrians) failed to notice that their conversation partner had changed. This finding suggests that naturally occurring events that briefly divert attention have the potential to markedly impair the accuracy of eyewitness identifications.

Attentional hijacking is particularly characteristic of stimuli that elicit strong emotional responses, such as fear and arousal.[35] Visual stimuli that trigger fear responses act as powerful external cues that command attention.[36] While this potentiates sensitivity to those stimuli, at the considerable expense of sensitivity to others, it is often the case that the attended emotional stimuli are not the ones with relevant informational content.[37] The so-called weapon focus is a real-world case in point for eyewitness identification, in which attention is compellingly drawn to emotionally laden stimuli, such as a gun or a knife, at the expense of acquiring greater visual information about the face of the perpetrator (see also discussion of weapon focus in Chapter 5).[38] (One might argue that this is an adaptation that benefits immediate action or engagement with a threatening stimulus, but is surely detrimental to one's efforts to bear witness.)

Visual Perception

Visual perception is the conscious functional result of efforts to identify the environmental causes of the pattern of light cast onto the back of the eye.[39] Perception does not reflect the sensory world passively, as camera film detects patterns of light. On the contrary, visual perception is constructive

[35] C. H. Hansen and R. D. Hansen, "Finding the Face in the Crowd: An Anger Superiority Effect," *Journal of Personality and Social Psychology* 54: 917–924 (1988). E. Fox et al., "Facial Expressions of Emotion: Are Angry Faces Detected More Efficiently?" *Cognition and Emotion* 14(1): 61–92 (2000). R. Compton, "The Interface Between Emotion and Attention: A Review of Evidence from Psychology and Neuroscience," *Behavioral and Cognitive Neuroscience Reviews* 2(2): 115–129 (2003). R. L. Bannerman, E. V. Temminck, and A. Sahraie, "Emotional Stimuli Capture Spatial Attention But Do Not Modulate Spatial Memory," *Vision Research* 65: 12–20 (15 July 2012).

[36] J. A. Easterbrook, "The Effects of Emotion on Cue Utilization and the Organization of Behavior," *Psychological Review* 66(3): 183–201 (1959).

[37] E. Ferneyhough et al., "Anxiety Modulates the Effects of Emotion and Attention on Early Vision," *Cognition and Emotion* 27(1): 166–176 (2013). G. Pourtois and P. Vuilleumier, "Dynamics of Emotional Effects on Spatial Attention in the Human Visual Cortex," *Progress in Brain Research* 156: 67–91 (2006).

[38] T. Kramer, R. Buckhout, and P. Eugenio, "Weapon Focus, Arousal, and Eyewitness Memory: Attention Must Be Paid," *Law and Human Behavior* 14(2): 167–184 (1990). R. S. Truelove, "Do Weapons Automatically Capture Attention," *Applied Cognitive Psychology* 20(7): 871–893 (2006). E. F. Loftus, G. R. Loftus, and J. Messo, "Some Facts About 'Weapon Focus'," *Law and Human Behavior* 11(1): 55–62 (1987).

[39] W. James, *Principles of Psychology* (New York: Henry Holt, 1890). S. Harnad, ed., *Categorical Perception: The Groundwork of Cognition* (New York: Cambridge University Press, 1987). T. D. Albright, "Perceiving," *Daedalus* (in press).

and entails (1) integrating and segmenting attended attributes of the visual image into objects, (2) complementing and interpreting the product with expectations derived from memory of prior experiences with the world, and (3) assigning meaning and emotional valence by reference to prior knowledge of function and value.[40] All of these perceptual processes are affected by noise. Because the things perceived are the things we place into memory, perceptual noise can dramatically limit the accuracy of eyewitness identification.

The process of feature integration and interpretation may be distorted by images of an object unique to a specific angle of view.[41] The retinal pattern generated by a face viewed directly from the front differs considerably—with changes in aspect ratio and relative placement of facial features—from that generated by a face viewed from an oblique side angle. Viewing a face from an angle above or below center (as might be the case if the criminal were standing over you, or below you on the stairs) also yields retinal distortions of facial features. In this case, the distortions prominently mimick facial gestures of smiling versus frowning, and perhaps cause incorrect inferences about the emotional state of the person observed and his or her intentions and motivations. (This distortion is the basis for the Japanese Noh Theatre mask effect, in which a rigid mask tilted forward leads to the appearance of a smile and backward leads to the appearance of a frown—an effect you can simulate by simply looking into the mirror and tilting your face up or down.)[42]

Viewing conditions can also affect the perception of face, gender, and age.[43] Investigators found that faces that were physically identical—and particularly those bordering on androgyny—were perceived as unambiguously male or female depending on where they appeared in the observer's visual field. The spatial patterning of these effects was distinctive and stable for each observer. Perceptual distortions of this sort are a source of noise that may have important implications for the accuracy of eyewitness identification.

Perceptual distortions also may be introduced through memory recall.

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[40]C. D. Gilbert, "The Constructive Nature of Visual Processing," in *Principles of Neuroscience*, 5th Edition, ed. E. Kandel, J. H. Schwartz, T. M. Jessell, S. A. Siegelbaum, and A. J. Hudspeth (New York: McGraw-Hill Professional, 2012). T. D. Albright, "On the Perception of Probable Things: Neural Substrates of Associative Memory, Imagery, and Perception," *Neuron* 74 (2): 227–245 (2012).

[41]W. G. Hayward and P. Williams, "Viewpoint Dependence and Object Discriminability," *Psychological Science* 11(1): 7–12 (2000).

[42]M. J. Lyons et al., "The Noh Mask Effect: Vertical Viewpoint Dependence on Facial Expression Perception," *Proceedings of the Royal Society B: Biological Sciences* 267(1459): 2239–2245 (2000).

[43]A. Afraz, M. Vaziri-Pashkam, and P. Cavanagh, "Spatial Heterogeneity in the Perception of Face and Form Attributes," *Current Biology* 20(23): 2112–2116 (2010).

The way an observer experiences a visual scene—the setting, the people, and the actions associated with a crime —is commonly influenced as much by expectations from prior experience with the world as it is by the precise patterns of light cast upon the retina. There are good reasons why this is true. As noted above, the sensory input (the pattern of light received) is often noisy, incomplete, and ambiguous, and memories of what is *likely* to be out there, given the context, are called on to fill in the blanks, reconcile ambiguities, and leave clear and coherent percepts.[44] This perceptual completion is probabilistic.[45] It is an hypothesis, and the accuracy naturally depends on the degree to which the observer's expectations match the noisy sensory data.

What is implied is that the same mechanism that grants the certainty of perceptual experience in the face of noise and ambiguity is also capable of implicitly fabricating content that does not correspond to external reality and yet is experienced with no less certainty. Performance magic relies on this constructive nature of perceptual experience, and that nature is also the foundation for many visual illusions and forms of visual art.[46] In a classic experiment that drives home the point, Bruner and Postman looked at the ability of observers to recognize "trick" playing cards.[47] The trick cards were created by altering the color of a given suit (e.g., a red seven of spades). Observers were shown a series of cards with brief presentations. Some cards were trick, and the remainder normal. With astonishing frequency, observers reported that the trick cards were normal. When questioned, observers defended their reports, even after being allowed to scrutinize the trick cards, thus demonstrating that learned properties of the world are capable of sharply altering our experience and, moreover, reinforcing our convictions about what we have seen, even in the face of countermanding sensory evidence. In view of this inherent dependence of perception on prior experiences and context—and, importantly, the fact that the viewer is commonly none the wiser when perception differs from

[44]Albright, "On the Perception of Probable Things."

[45]D. C. Knill and W. Richards, *Perception as Bayesian Inference*, ed. D. C. Knill and W. Richards (Cambridge: Cambridge University Press, 1996). D. Kersten "High-level Vision as Statistical Inference," in *The New Cognitive Neurosciences*, 2nd Edition, ed. M. S. Gazzaniga (Cambridge: MIT Press, 1999), 353–363. D. Kersten, P. Mamassian, and A. Yuille, "Object Perception as Bayesian Inference," *Annual Review of Psychology* 55: 271–304 (February 2004).

[46]E. H. Gombrich, *Art and Illusion. A Study in the Psychology of Pictorial Representation* (London: Phaidon 1960). T. D. Albright, "The Veiled Christ of Cappella Sansevero: On Art, Vision and Reality," Leonardo 46(1): 19–23 (2013). Macknik, Martinez-Conde, and Blakeslee, *Sleights of Mind: What the Neuroscience of Magic Reveals About Our Everyday Deceptions* (New York: Henry Holt and Co., 2010).

[47]J. S. Bruner and L. Postman, "On the Perception of Incongruity: A Paradigm," *Journal of Personality* 18(2): 206–223 (1949).

the "ground truth" of the external world—it appears that accurate eyewitness identification may be difficult to achieve.

Additional noise (in this case defined as uncertainty resulting from loss of perceptual resolution) may result from the fact that visual perception is categorical.[48] Although the objects of our experience vary broadly along multiple sensory dimensions, we lump them into categories based upon prior associations, many of which stem from common functions, physical properties, meanings, or emotional valence. Apples in a basket or the many typographic fonts for the letter "A" are visually distinct, yet we readily perceive them as categorically identical. For most behavioral and cognitive goals, perceptual processing is greatly simplified by treating all members of a category as the same, despite their differences. It rarely matters, for example, whether the apple we choose is dappled on one side or irregular in shape, nor does the font used bear greatly on our ability to read. One of the functional corollaries of categorical perception is that observers are far better at discriminating between objects from different categories than objects from the same category.[49] Evidence indicates that the structure of object memory is also categorical, suggesting that perceived objects are encoded in memory as a category type, often without specific detail.[50]

Perceptual categorization naturally applies to faces.[51] We readily categorize faces by distinctions along the obvious dimensions of gender, age,

[48]W. James, *Principles of Psychology* (New York: Henry Holt, 1980). S. Harnad, ed., *Categorical Perception: The Groundwork of Cognition* (New York: Cambridge University Press, 1987).

[49]R. Goldstone, "Influences of Categorization on Perceptual Discrimination," *Journal of Experimental Psychology General* 123(2): 178–200 (1994). R. Goldstone, Y. Lippa, and R. M. Shiffrin, "Altering Object Representations Through Category Learning," *Cognition*, 78(1): 27–43 (2001).

[50]E. Tulving, "Episodic and Semantic Memory," in *Organization of Memory*, ed. E. Tulving and W. Donaldson (New York: Academic Press, 1972), 381–403. L. K. Tyler et al., "Processing Objects at Different Levels of Specificity," *Journal of Cognitive Neuroscience* 16(3): 351–362 (2004). M. J. Farah and J. L. McClelland, "A Computational Model of Semantic Memory Impairment: Modality Specificity and Emergent Category Specificity," *Journal of Experimental Psychology: General* 120 (4): 339–357 (1991). C. Gerlach et al., "Categorization and Category Effects in Normal Object Recognition: A PET Study," *Neuropsychologia* 38(13): 1693–1703 (2000). G. W. Humphreys and E. M. Forde, "Hierarchies, Similarity, and Interactivity in Object Recognition: 'Category-Specific' Neuropsychological Deficits," *Behavioral and Brain Sciences* 24(3): 453–476 (2001).

[51]J. M. Beale and F. C. Keil, "Categorical Effects in the Perception of Faces," *Cognition* 57(3): 217–239 (1995). D. T. Levin, "Classifying Faces by Race: The Structure of Face Categories," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 22(6):1364–1382 (1996). D. T. Levin and J. Beale, "Categorical Perception Occurs in Newly Learned Faces, Cross-Race Faces, and Inverted Faces," *Perception and Psychophysics* 62: 386–401 (2000). M. A. Webster et al., "Adaptation to Natural Facial Categories," *Nature* 428(6982): 557–561 (2004). Y. Lee et al., "Broadly Tuned Face Representation in Older Adults Assessed by Categorical Perception," *Journal of Experimental Psychology: Human Perception and Performance* 40(3): 1060–1071 (2014).

and race, but we also draw distinctions along dimensions such as skin tone, hair color and style, presence and type of facial hair, such subtler factors as shape of cheeks and jaw, and subjective qualities such as attractiveness. The practical consequence of this for eyewitness identification is that the precision of a perceptual experience may be reduced within any of these categories, particularly because we typically witness criminal events for such a brief period of time. The ensuing memory of the experience will likely reflect that reduced precision, and the memory retrieved may regress to a category prototype or to other exemplars of the perceived category.[52] The witness may categorically perceive a square jawed man with a moustache, but the fine details needed for individuation of a suspect are neither perceived nor encoded in memory. For example, although you may have seen the iconic Marlboro Man countless times on billboards and in magazines, it is unlikely that you could distinguish him in a lineup from other square jawed mustachioed men.

MEMORY

Functional Processes of Memory

Conscious visual perceptual experiences, rendered by the processes described in the previous section on vision, are commonly stored as *declarative memories*, meaning that they can be consciously accessed and expressed as knowledge about the world (as distinct from *procedural memories*, such as motor skills).[53] Declarative memories are of two types, semantic and episodic, reflecting a distinction between memories of meanings, facts, and concepts versus memories of events (such as those witnessed during a crime).[54] Declarative memories are conceptualized as involving three core processes—encoding, storage, and retrieval—which refer to the placement of items in memory, their maintenance therein, and subsequent access to the stored information.[55]

Like vision, memory is also beset by noise. Encoding, storage, and remembering are not passive, static processes that record, retain, and divulge

[52]J. Huttenlocher, L. V. Hedges, and J. L. Vevea, "Why Do Categories Affect Stimulus Judgement?" *Journal of Experimental Psychology: General* 129(2): 220–241 (2000). R. Goldstone, Y. Lippa, and R. M. Shiffrin, "Altering Object Representations Through Category Learning," *Cognition* 78(1): 27–43 (2001).

[53]W. James, *Principles of Psychology* (New York: Henry Holt, 1890). B. Milner, *Physiologie de l'hippocampe*, ed. P. Passouant (Paris: Centre National de la Recherche Scientifique, 1962), 257–272. L. R. Squire and J. Wixted, "The Cognitive Neuroscience of Human Memory since H.M.," *Annual Review of Neuroscience* 34: 259–288 (2011).

[54]Tulving, "Episodic and Semantic Memory."

[55]E. Tulving, "Organization of Memory: Quo vadis?" in *The Cognitive Neurosciences*, ed. M. S. Gazzaniga (Cambridge, MA: MIT Press, 1995), 839–847.

their contents in an informational vacuum, unaffected by outside influences. The contents cannot be treated as a veridical permanent record, like photographs stored in a safe. On the contrary, the fidelity of our memories for real events may be compromised by many factors at all stages of processing, from encoding through storage, to the final stages of retrieval. Without awareness, we regularly encode events in a biased manner and subsequently forget, reconstruct, update, and distort the things we believe to be true.[56]

The following sections discuss memory encoding, storage, and retrieval, with emphasis on the limits of these processes as they pertain to eyewitness identification. Emotions can strongly influence these processes of memory; some specific actions are highlighted. The phenomenon of "recognition memory" is also discussed. This refers to the specific type of memory retrieval in which a stimulus (e.g., a face) is used to probe memory, and the rememberer (e.g., an eyewitness) must decide whether the strength of the elicited memory evidence is sufficient to declare that the stimulus was previously encountered or is novel. Recognition memory underlies eyewitness identification, as the witness must make a recognition decision.

Memory Encoding

Memory encoding refers to the process whereby perceived objects and events are initially placed into storage. The encoding process involves two stages, which are commonly distinguished by the quantity of information stored, the duration of storage, and the susceptibility to interference.[57] Short-term or working memory is the conscious content of recent perceptual experiences or information recently recalled from long-term storage. Information that remains at the focus of attention persists in and forms the contents of short-term memory. This form of memory is of limited duration

[56]J. T. Wixted, "The Psychology and Neuroscience of Forgetting," *Annual Review of Psychology* 55: 235–269 (2004). E. Tulving and D. M. Thomson, "Encoding Specificity and Retrieval Processes in Episodic Memory," *Psychological Review* 80(5): 352–373 (1973). Y. Dudai, "Reconsolidation: The Advantage of Being Refocused," *Current Opinion in Neurobiology* 16(2): 174–178 (2006). E. F. Loftus, "Planting Misinformation in the Human Mind: A 30-Year Investigation of the Malleability of Memory," *Learning and Memory* 12(4): 361–366 (2005). R. A. Bjork, "Interference and Memory," in *Encyclopedia of Learning and Memory*, ed. L. R. Squire (New York: Macmillan, 1992), 283–288. J. A. McGeoch, "Forgetting and the Law of Disuse," *Psychological Review* 39(4): 352–370 (1932). J. G. Jenkins and K. M. Dallenbach, "Obliviscence during Sleep and Waking," *The American Journal of Psychology* 35(4): 605–612 (1924). B. J. Underwood and L. Postman, "Extra-Experimental Sources of Interference in Forgetting," *Psychological Review* 67 (2): 73–95 (1960).

[57]R. C. Atkinson and R. M. Shiffrin, "Human Memory: A Proposed System and its Control Processes," in *The Psychology of Learning and Motivation* (Volume 2), ed. K. W. Spence and J. T. Spence (New York: Academic Press,1968), 89–195. W. James, *Principles of Psychology* (New York: Henry Holt, 1890). A. Baddeley, "Working Memory: Looking Back and Looking Forward," *Nature Reviews Neuroscience* 4(10): 829–839 (2003). A. Baddley, *Working Memory* (New York: Oxford University Press, 1986).

and capacity[58] and labile, decaying quickly with time and easily disrupted by other perceptual or cognitive processes.[59] Through cellular and molecular events that play out over time, the contents of short-term memories may be encoded and consolidated into long-term memory,[60] which is more enduring (albeit evolving with ongoing experience), and of greater capacity.

The structure of an individual's full library of long-term declarative memories can be thought of as a collection of associations between items of specific semantic (e.g., the fact that that person X is a 34-year-old female) or episodic content (e.g., the fact that person X was at location Y on the night of the witnessed crime).[61] As the individual gains new experiences, long-term declarative memories may be updated by adding new content to the existing library or by forming new associations between existing content.[62]

Memories are particularly labile during the encoding process. The contents of short-term memory are limited and highly subject to interference by subsequent sensory, cognitive, emotional, or behavioral events; the contents can also be biased by prior knowledge, expectations, or beliefs, resulting in a distorted representation of experience. Short-term memories of events that happened early in a witnessed proceeding may simply be forgotten with the passage of time or badly compromised by attention directed to subsequent emotional events or cognitive and behavioral demands (e.g., anxiety, fear, the need to escape). In such cases, the compromised information may never be consolidated fully into long-term storage or that storage may contain distorted content.[63] At the same time, the quality of encoding of stimuli that are attended is commonly enhanced by highly emotional content.[64]

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[58]G. A. Miller, "The Magical Number Seven," *The Psychological Review* 63(2): 81–97 (1956).

[59]J. Jonides et al., "The Mind and Brain of Short-Term Memory," *Annual Review of Psychology* 59: 193–224 (2008).

[60]E. Kandel and L. Squire, *Memory: From Mind to Molecules* (New York: Scientific American Library, 2008).

[61]J. R. Anderson, *The Architecture of Cognition* (Cambridge: Harvard University Press, 1983). J. R. Anderson and C. Lebiere, *The Atomic Components of Thought* (Mahwah: Lawrence Erlbaum Associates, 1998).

[62]M. P. Walker et al., "Dissociable Stages of Human Memory Consolidation and Reconsolidation," *Nature* 425: 616 (2003).

[63]J. L. McGaugh, "Memory—a Century of Consolidation," *Science* 287(5451): 248–251 (2000). J. L. McGaugh and B. Roozendaal, "Role of Adrenal Stress Hormones in Forming Lasting Memories in the Brain," *Current Opinion in Neurobiology* 12(2): 205–210 (2002).

[64]K. N. Ochsner, "Are Affective Events Richly Recollected or Simply Familiar? The Experience and Process of Recognizing Feelings Past," *Journal of Experimental Psychology: General* 129 (2): 242–261 (2000). D. Talmi, et al., "Immediate Memory Consequences of the Effect of Emotion on Attention to Pictures," *Learning and Memory* 15(2008): 172–182. E. A. Kensinger and D. L. Schacter, "Neural Processes Supporting Young and Older Adults' Emotional Memories," *Journal of Cognitive Neuroscience* 7 (2008): 1–13. E. A. Phelps. "Emotion and Cognition: Insights from Studies of the Human Amygdala," *Annual Review of Psychology* 57: 27–53 (2006).

Memory Storage

Memory storage refers to the long-term retention of information after encoding. The stability of stored information is continuously challenged and subject to modification. We forget, qualify, or distort existing memories as we acquire new perceptual experiences and encode new content and associations into memory.[65]

Forgetting can be partially mitigated, and memories stabilized, by habits of retrieval (or reactivation) and reconsolidation, which happen whenever we tell the story of our experiences.[66] Reactivation is not perfect. With each implicit retrieval or explicit telling of a story, we may unconsciously smooth over inconsistencies or modify content based on our prior beliefs, the accounts of others, or through the lens of new information. We may add embellishments that reflect opinions, emotions, or prejudices[67] rather than observed facts; or we may simply omit disturbing content and pass over fine details.[68]

A second threat to the stability of long-term memories is, ironically, our life-long ability to learn new things. Because memory mechanisms are inherently plastic throughout life, content stored for the long term is surprisingly labile in the face of new information. Our memories are thus an ever-evolving account of our experiences. A memory that reflects witnessing person X at location Y on a particular evening might be readily and notably updated by subsequent learning that location Y is the home of a business associate of person X. Our memories of the witnessed actions of person

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[65]J. T. Wixted, "The Psychology and Neuroscience of Forgetting," *Annual Review of Psychology* 55: 235–269 (2004). Tulving and Thomson, "Encoding Specificity and Retrieval Processes." Y. Dudai, "Reconsolidation: The Advantage of Being Refocused," *Current Opinion in Neurobiology* 16(2): 174–178 (2006). E. F. Loftus, "Planting Misinformation in the Human Mind: A 30-Year Investigation of the Malleability of Memory," *Learning and Memory* 12(4): 361–366 (2005). R. A. Bjork, "Interference and Memory," in *Encyclopedia of Learning and Memory*, ed. L. R. Squire (New York: Macmillan, 1992), 283–288. J. A. McGeoch, "Forgetting and the Law of Disuse," *Psychological Review* 39(4): 352–370 (1932). J. G. Jenkins and K. M. Dallenbach, "Obliviscence During Sleep and Waking," *The American Journal of Psychology* 35 (1924): 605–612. B. J. Underwood and L. Postman, "Extra-Experimental Sources of Interference in Forgetting," *Psychological Review* 67(2): 73–95 (1960). E. F. Loftus, "The Malleability of Human Memory," *American Scientist* 67(3): 312–320 (1979). D. J. Yi et al., "When a Thought Equals a Look: Refreshing Enhances Perceptual Memory," *Journal of Cognitive Neuroscience* 20(8): 1371–1380 (2008).

[66]C. M. Alberini, *Memory Reconsolidation* (Waltham: Academic Press, 2013).

[67]D. L. Schacter, *Psychology*, Second Edition (New York: Worth Publishers, 2011), 253–254. E. F. Loftus and H. G. Hoffman, "Misinformation and Memory, the Creation of New Memories," *Journal of Experimental Psychology* 118(1): 100–104 (1989). G. Mazzoni and A. Memon, "Imagination Can Create False Autobiographical Memories," *Psychological Science* 14(2): 186–188 (2003).

[68]F. C. Bartlett, *Remembering: A Study in Experimental and Social Psychology* (London: Cambridge University Press, 1932).

X may be qualified by new knowledge of his or her life history. Moreover, because new content can be added and the source of that content forgotten, we may attribute our updated memories to the originally witnessed events—in some cases substantially changing what we believe we have seen.[69] It is thus not surprising that newly incorporated information need not be true to fact. Research on *false memories* shows that it is possible to plant fabricated content in memory, which leads us to recall things we never experienced.[70]

The emotional content of stored memories is a factor that appears to promote long-term retention; memories of highly arousing emotional stimuli, such as those associated with a witnessed crime, tend to be more enduring than memories of non-arousing stimuli.[71] Highly salient, unexpected, or arousing events—such as the Kennedy assassination or the Space Shuttle disaster—are commonly more strongly stored in memory, and their later retrieval is often associated with the subjective experience

[69]D. S. Lindsay and M. K. Johnson, "Recognition Memory and Source Monitoring," *Bulletin of the Psychonomic Society* 29(3): 203–205 (1991). D. L. Schacter and C. S. Dodson, "Misattribution, False Recognition and the Sins of Memory," *Philosophical Transactions of the Royal Society: Biological Sciences* 356(1413): 1385–1393 (2001). L. A. Henkel, N. Franklin, and M. K. Johnson, "Cross-Modal Source Monitoring Confusions Between Perceived and Imagined Events," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 26(2): 321–335 (2000). D. L. Schacter, ed., *Memory Distortion: How Minds, Brains, and Societies Reconstruct the Past* (Cambridge, MA: Harvard University Press, 1995). K. J. Mitchell and M. K. Johnson, "Source Monitoring: Attributing Mental Experiences," in *The Oxford Handbook of Memory*, ed. E. Tulving and F. I. M. Craik (New York: Oxford University Press, 2000), 179–195. H. L. Roediger III and K. B. McDermott, "Creating False Memories: Remembering Words Not Presented in Lists," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 21(4): 803–814 (1985).

[70]Loftus, "Planting Misinformation in the Human Mind." E. F. Loftus and J. E. Pickrell, "The Formation of False Memories," *Psychiatric Annals* 25(12): 720–725 (1995). M. K. Johnson and C. L. Raye, "False Memories and Confabulation," *Trends in Cognitive Sciences* 2(4): 137–145 (1998).

[71]L. J. Kleinsmith and S. Kaplan, "Paired-Associate Learning as a Function of Arousal and Interpolated Interval" *Journal of Experimental Psychology* 65(2): 190–193 (1963). M. W. Eysenck, "Arousal, Learning, and Memory," *Psychological Bulletin* 83(3): 389–404 (1976). F. Heuer and D. Reisberg, "Vivid Memories of Emotional Events: The Accuracy of Remembered Minutiae," *Memory and Cognition* 18(5): 496–450 (1990). T. Sharot and E. A. Phelps, "How Arousal Modulates Memory: Disentangling the Effects of Attention and Retention," *Cognitive, Affective, and Behavioral Neuroscience* 4(3): 294–306 (2004). E. A. Kensinger, R. J. Garoff-Eaton, and D. L. Schacter, "Memory for Specific Visual Details Can Be Enhanced by Negative Arousing Content," *Journal of Memory and Language* 54(1): 99–112 (2006). E. Kensinger, "Remembering Emotional Experiences: The Contribution of Valence and Arousal," *Reviews in the Neurosciences* 15(4): 241–251 (2004).

of high vividness and a sense of reliving[72] (although not necessarily with greater accuracy, as detailed below). The stronger encoding and storage of emotional memories results from the engagement of a specialized system of stress hormones (glucocorticoids) which is triggered by arousing content and has potentiating effects on the neuronal processes underlying memory consolidation and storage.[73] Despite the vividness and the sense of reliving that characterizes retrieval of emotional memories, there are many indications that such memories are just as prone to errors.[74] This may reflect, in part, memory enhancements, of the sort described above, which accompany frequent re-consolidation or re-telling of the story of the emotional experience, and often include details (some true to fact, some not) learned after the experience.[75] Although emotional memories are often inaccurate in detail, one important corollary of their vividness is that they are frequently

[72]G. Wolters and J. J. Goudsmit, "Flashbulb and Event Memory of September 11, 2001: Consistency, Confidence and Age Effect," *Psychological Report 96*: 605–619 (2005). E. A. Kensinger, A. C. Krendl, and S. Corkin, "Memories of an Emotional and a Nonemotional Event: Effects of Aging and Delay Interval," *Experimental Aging Research* 32: 23–45 (2006). U. Neisser and N. Harsch, "Phantom Flashbulbs: False Recollections of Hearing the News about Challenger," in *Affect and Accuracy in Recall: Studies of "Flashbulb" Memories*, ed. E. Winograd and U. Neisser (New York: Cambridge University Press, 1992): 9–31. K. S. LaBar and E. A. Phelps, "Arousal-Mediated Memory Consolidation: Role of the Medial Temporal Lobe in Humans," *Psychological Science* 9(6): 490–493 (1998).

[73]J. L. McGaugh, "Memory: A Century of Consolidation," *Science* 287(5451): 248–251 (2000). J. L. McGaugh and B. Roozendaal, "Role of Adrenal Stress Hormones in Forming Lasting Memories in the Brain," *Current Opinion in Neurobiology* 12(2): 205–210 (2002).

[74]E. A. Kensinger, "Remembering the Details: Effects of Emotion," *Emotion Review* 1(2): 99–113 (2009). T. Sharot, M. R. Delgado, and E. A. Phelps, "How Emotion Enhances the Feeling of Remembering," *Nature Neuroscience* 7(12): 1376–1380 (2004). H. Schmolck, E. A. Buffalo, and L. R. Squire, "Memory Distortions Develop over Time: Recollections of the O. J. Simpson Trial Verdict after 15 And 32 Months," *Psychological Science* 11 (1): 39–45 (2000). S. R. Schmidt, "Autobiographical Memories for the September 11th Attacks: Reconstructive Errors and Emotional Impairment of Memory," *Memory and Cognition* 32(3): 443–454 (2004). T. W. Buchanan and R. Adolphs, "The Role of the Human Amygdala in Emotional Modulation of Long-Term Declarative Memory," in *Emotional Cognition: From Brain to Behavior*, ed. S. Moore and M. Oaksford (Amsterdam: John Benjamins Publishing, 2002), 9–34.

[75]E. Soleti et al., "Does Talking About Emotions Influence Eyewitness Memory? The Role of Emotional vs. Factual Retelling on Memory Accuracy," *Europe's Journal of Psychology* 8(4): 632–640 (2012).

held with high confidence.[76] This breakdown of the relationship between accuracy and confidence can obviously undermine eyewitness accounts.[77]

The enduring plasticity of stored memories is a serious concern for the validity of eyewitness identification. A witness' inevitable interactions with law enforcement and legal counsel, not to mention communications from journalists, family, and friends, have the potential to significantly modify the witness' memory of faces encountered and of other event details at the scene of the crime.[78] Thus, the fidelity of retrieved events—and the accuracy of identification—is likely to be greater when retrieval occurs closer to the time of the witnessed events. The conclusion above has important implications for law enforcement and the legal process and calls into question the validity of in-court identifications and their appropriateness as statements of fact.

Memory Retrieval

Memory retrieval refers to the process by which stored information is accessed and brought into consciousness, where it can be used to make decisions and guide actions. Retrieval of long-term declarative memories is often triggered through association with an external stimulus (i.e., a retrieval cue).[79] For example, the slight stubble on a lineup participant's face may be enough to elicit retrieval of a suspect's entire face. These same retrieval processes can also be engaged internally—a verbally triggered stream of thought related to a witnessed crime may readily bring to mind visual features of the perpetrator. A corollary of this association-based phenomenon is that memory retrieval is often context dependent; a memory may be more

[76]U. Rimmele et al., "Emotion Enhances the Subjective Feeling of Remembering, Despite Lower Accuracy for Contextual Details," *Emotion* 11(3): 553–562 (2011). Kensinger, "Remembering the Detail." Neisser and Harsh, *Affect and Accuracy in Recall.* E. A. Phelps and T. Sharot, "How (and Why) Emotion Enhances the Subjective Sense of Recollection," *Current Directions in Psychological Science* 17(2): 147–152 (2008).

[77]K. A. Houston et al., "The Emotional Eyewitness: The Effects of Emotion on Specific Aspects of Eyewitness Recall and Recognition Performance," *Emotion* 13(1): 118–128 (2013). R. B. Edelstein et al., "Emotion and Eyewitness Memory," in *Memory and Emotion,* ed. D. Reisberg and P. Hertel (New York: Oxford University Press, 2004): 308–346. S-A. Christianson, "Emotional Stress and Eyewitness Memory: A Critical Review," *Psychological Bulletin* 112(2): 284–309 (1992).

[78]M. S. Zaragoza and S. M. Lane, "Sources of Misattribution and Suggestibility of Eyewitness Memory," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 20 (4): 934–945 (1994). W. C. Thompson, K. A. Clarke-Stewart, and S. J. Lepore, "What Did the Janitor Do? Suggestive Interviewing and the Accuracy of Children's Accounts," *Law and Human Behaviour* 21(4): 405–426 (1997). D. S. Lindsay and M. K. Johnson, "The Eyewitness Suggestibility Effect and Memory for Source," *Memory and Cognition* 17(3): 349–358 (1989).

[79]E. Tulving and Z. Pearlstone, "Availability Versus Accessibility of Information in Memory for Words," *Journal of Verbal Learning and Verbal Behaviour* 5: 381–391 (1966).

readily retrieved if the observer is in physical surroundings that are the same as or similar to those in which the original experiences took place (because the surroundings provide additional cues to trigger memory retrieval).[80]

Memory retrieval is heavily affected by various sources of noise. Similarities of meaning or appearance between retrieval cues and items in memory can easily lead to retrieval of the wrong item, producing a false memory.[81] This is particularly a problem given the categorical nature of memory.[82] The rugged mustachioed man in the lineup may lead to retrieval of the familiar categorical prototype—the Marlboro Man—rather than the specific person perceived at the scene of the crime, which in turn could interfere with or lead to errors in recognition (i.e., identification). Another type of memory retrieval failure is caused by "intrusion errors," in which information known to be commonly associated with events of a general type becomes incorporated into the retrieved content of a specific memory (and subsequently incorporated into the reconsolidated memory). For example, because guns are often associated with robbery, an observer may readily and unwittingly incorporate a gun into the retrieved version of his or her memory of a witnessed robbery.

Intrusion errors are one manifestation of a larger retrieval problem in which there is loss of information about the source of a memory. In cases of "source memory failure," we effectively forget how we know things (forget when and where we learned the content of our memories). What this means practically is that we may attribute later acquisition of information to earlier experiences. An eyewitness might learn from the police or some other source that a potential suspect has a moustache and then attribute

[80]D. Godden and A. Baddeley, "Context Dependent Memory in Two Natural Environments," *British Journal of Psychology* 66(3): 325–331 (1975). S. M. Smith and E. Vela, "Environmental Context-Dependent Eyewitness Recognition," *Applied Cognitive Psychology* 6: 125–139 (1992). S. M. Smith and E. Vela, "Environmental Context-Dependent Memory: A Review and Meta-Analysis," *Psychonomic Bulletin Review* 8 (2): 203–220 (2001). Tulving and Thomson, "Encoding Specificity and Retrieval Processes."

[81]J. R. Anderson, "A Spreading Activation Theory of Memory," *Journal of Verbal Learning and Verbal Behavior* 22(3): 261–295 (1983). A. M. Collins and E. F. Loftus, "A Spreading-Activation Theory of Semantic Processing," *Psychological Review* 82(6):407–428 (1975). H. L. Roediger III, D. A. Balota, and J. M. Watson, "Spreading Activation and Arousal of False Memories," in *The Nature of Remembering: Essays in Honor of Robert G. Crowder*, ed. H. L. Roediger III, J. Nairne, I. Neath, and A. Surprenant (Washington, DC: American Psychological Association, 2001): 95–115. C. J. Brainerd and V. F. Reyna, *The Science of False Memory* (New York: Oxford University Press, 2005).

[82]Tulving, "Episodic and Semantic Memory." M. J. Farah and J. L. McClelland, "A Computational Model of Semantic Memory Impairment: Modality Specificity and Emergent Category Specificity," *Journal of Experimental Psychology: General* 120(4): 339–357 (1991). G. W. Humphreys and E. M. Forde, "Hierarchies, Similarity, and Interactivity in Object Recognition: 'Category-Specific' Neuropsychological Deficits," *Behavioral and Brain Sciences* 24(3): 453–476 (2001).

that knowledge to the witnessed events, which may, in turn, have disastrous consequences for the ability of the eyewitness to accurately report what she or he has seen.

As for the processes of memory encoding and storage, the emotional content of memory also affects memory retrieval. As noted above, memory retrieval is commonly context dependent. A related and well-documented phenomenon that bears on emotional memories is *state dependent memory*, in which retrieval accuracy is best if the individual's cognitive state at the time of retrieval matches cognitive state at the time of encoding.[83] When memories have an emotional component, retrieval may be best when the individual is induced to a corresponding emotional state (*mood dependent memory*),[84] which is accomplished by verbally or physically placing him or her in the same context, and may offer a valuable investigative tool for probing eyewitness accounts.[85]

Recognition Memory

Recognition memory is a specific type of declarative memory retrieval in which a sensory stimulus (a "cue" stimulus) elicits a memory of the stimulus stored following a prior encounter and often the sequence of events involving the stimulus, the spatial context in which the stimulus was experienced, and the presence of other objects, people, or thoughts that had appeared with the stimulus during the event.[86] Recognition memory decisions are based on the retrieved memory evidence, which can be triggered by the stimulus and can also emerge from an active search of items

[83]D. W. Goodwin et al., "Alcohol and Recall: State-Dependent Effects in Man," *Science* 163(3873): 1358–1360 (1969). Tulving and Thomson, "Encoding Specificity and Retrieval Processes." *Psychological Review* 80(5): 352–373 (1973). E. Girden and E. Culler, "Conditioned Responses in Curarized Striate Muscle in Dogs," *Journal of Comparative Psychology* 23(2): 261–274 (1937). D. A. Overton, "State-Dependent or 'Dissociated' Learning Produced with Pentobarbital," *Journal of Comparative and Physiological Psychology* 57(1): 3–12 (1964).

[84]P. M. Kenealy, "Mood State-Dependent Retrieval: The Effects of Induced Mood on Memory Reconsidered," *The Quarterly Journal of Experimental Psychology Section A: Human Experimental Psychology* 50(2): 290–317 (1997). P. A. Lewis and H. D. Critchley, "Mood-Dependent Memory," *Trends in Cognitive Sciences* 7(10): 431–433 (2003). G. H. Bower, "Mood and Memory," *American Psychologist* 36(2): 129–148 (1981). F. I. M. Craik and R. S. Lockhart, "Levels of Processing: A Framework for Memory Research," *Journal of Verbal Learning and Verbal Behavior* 11(6):671–684 (1972). Kensinger, "Remembering the Detail." K. A. Leight and H. C. Ellis "Emotional Mood States, Strategies, and State-Dependency in Memory," *Journal of Verbal Learning and Verbal Behavior* 20(3): 251–266 (1981).

[85]S. M. Smith and E. Vela, "Environmental Context-Dependent Eyewitness Recognition," *Applied Cognitive Psychology* 6: 125–139 (1992).

[86]G. Mandler, "Recognizing: The Judgment of Previous Occurrence," *Psychological Review* 87(3): 252–271 (1980).

in memory. One factor affecting the strength of the evidence retrieved is the similarity between the cue stimulus and the stimulus or stimuli that was/were previously encountered during the event. An observer engaged in this process holds an implicit criterion for the strength of evidence required to reach a positive decision. In the case of eyewitness identification, this process is routinely elicited by viewing faces in a lineup. When the evidence retrieved is insufficient to reach a decision, this can lead to a cycle of ever-greater scrutiny of the cue stimulus and efforts to recollect additional details of the original event. Ultimately a decision must be made about whether the retrieved evidence is sufficient to declare that the stimulus was previously experienced (or previously experienced in the particular event of interest) or whether the stimulus is novel (or not from the event of interest). If a recognition event occurs—that is, if the memory search triggered by one of the faces in the lineup leads to a strong enough subjective experience that the face is familiar and/or the recollection of sufficient event details—then the witness may declare that they recognize the face as having been previously encountered. Recognition memory decisions can thus be thought of as the final stage in the process of eyewitness identification.

Because it is a form of memory retrieval, recognition memory is susceptible to all of the factors summarized above that are known to interfere with retrieval. Recognition memory differs from other forms of retrieval (such as recalling a phone number or a cake recipe), however, in that a comparison must be made between the retrieved evidence and a decision threshold. That is, as noted above, recognition judgments require a decision criterion, an understanding of which presents a unique set of challenges for eyewitness identification (and recognition memory, generally). In particular, an observer's report of recognition (or, in a lineup setting, of identification) is influenced not simply by the strength or quality of the recalled memory evidence. The report of recognition (identification of a lineup member) is also influenced by the level of evidence that the observer finds acceptable to reach such a decision, i.e., by his or her decision criterion, or bias. An observer who holds a liberal criterion will likely recognize many true targets (i.e., the guilty), but will frequently err by reporting recognition of many false targets (i.e., innocents). Conversely, an observer who holds a conservative criterion will avoid the problem of erroneous recognition (identification), but will fail to identify some true targets. Estimating (or controlling) the observer's decision criterion is thus a critical step in efforts to judge the validity of an identification (see also Chapter 5).

Recognition memory for faces differs greatly between familiar and unfamiliar faces.[87] Because we often identify familiar individuals with ease,

[87]P. J. B. Hancock, V. Bruce, and A. M. Burton, "Recognition of Unfamiliar Faces," *Trends in Cognitive Sciences* 4(9): 330–337 (2000).

we tend to think we are generally very good at face recognition. However, we are not as good with unfamiliar faces.[88] All of the sources of noise that influence perception and memory contribute to these difficulties, and they are exacerbated by the attempts by criminals to conceal their identity (even a change in hairstyle and clothing can have a major effect on recognition).

The ability to recognize unfamiliar faces differs widely across individuals. At one extreme are those people, referred to as "super recognizers," who rarely forget a face.[89] At the other end of the spectrum are "face-blind people (prosopagnosics)," who have great difficulty recognizing even highly familiar faces.[90] Current estimates of the fraction of the general population afflicted by prosopagnosia are as high as ~2 percent.[91] The ability of an eyewitness to identify a suspect may thus differ greatly from individual to individual simply as a consequence of general variations in face recognition ability.

CONCLUSION

The shortcomings of eyewitness identification present a societal problem that has profound implications for our systems of law and justice. Ultimately, a solution to this problem must be informed by a thorough understanding of human vision and memory. The processes of vision and memory, which are fundamental to human experience, have been frequent targets of scientific investigation since the 19th century. The past few decades have seen an explosion of additional research that has led to important insights into how vision and memory work, what we see and remember best, and what causes these processes to fail. The committee has reviewed much of this research, as it pertains to eyewitness identification, and has identified restrictions on what can be seen under specific environmental and behavioral conditions (e.g., as poor illumination, limited viewing duration, viewing angle), factors that impede the ability to attend to critically informative features of a visual scene (e.g., the deleterious effect of an attention-grabbing element, such as a weapon, on the ability to correctly perceive the features of the assailant's face), distortions of perceptual experience derived from expectations, and ways in which emotion and stress enhance or suppress specific perceptual experiences. Memory is often far

[88]V. Bruce, "Changing Faces: Visual and Non-Visual Coding Processes in Face Recognition," *British Journal of Psychology* 73: 105–116 (1982).

[89]R. Russell, B. Duchaine, and K. Nakayama, "Super-Recognisers: People with Extraordinary Face Recognition Ability," *Psychonomic Bulletin and Review* 16(2): 252–272 (2009).

[90]T. Susilo and B. Ducahine, "Advances in Developmental Prosopagnosia Research," *Current Opinion in Neurobiology* 2(3):423–429 (2013).

[91]I. Kennerknecht et al., "First Report of Prevalence of Nonsyndromic Hereditary Prosopagnosia (HPA)," *American Journal of Medical Genetics Part A* 140(15): 1617–1622 (2006).

from a faithful record of what was perceived through the sense of sight: its contents can be forgotten or contaminated at multiple stages, it can be biased by the very practices designed to elicit recall, and it is heavily swayed by emotional states associated with witnessed events and their recall. From this analysis, the committee must conclude that there are insurmountable limits on vision and memory imposed by our biological nature and the properties of the world we inhabit. With this knowledge, it is possible to more fully appreciate the value and risks associated with eyewitness reports and accordingly advise those who collect, handle, defend, consider, and adjudicate such reports.

5

Applied Eyewitness Identification Research

The committee was tasked with (1) critically assessing the existing body of scientific research on eyewitness identification; (2) identifying gaps in the literature; and (3) suggesting other research that would further the understanding of eyewitness identification and improve law enforcement and courtroom practice. Eyewitness identification research resides in both the scientific literature and the law and justice-related scholarly literature. Although experiential, anecdotal, and some administrative records from law enforcement and the judiciary could contribute to a better understanding of eyewitness identification, the committee did not comprehensively review this more qualitative material. The committee did, however, examine select examples of law enforcement policies and influential judicial rulings.

In late 2013, the committee compiled an extensive and comprehensive bibliography from the following nine electronic databases, with the search limited to publications over the past two decades (i.e., since 1993): Academic Search Premier (EBSCO), Embase (Elsevier), MEDLINE (National Library of Medicine), NCJRS Abstracts Database (U.S. Department of Justice), PsycINFO (American Psychological Association), PubMed (National Institutes of Health), Scopus (Elsevier), Web of Science (Thomson Reuters), and LexisNexis.[1] Papers were drawn from such fields as social science, cognitive science, behavioral science, neuroscience, criminology, and law

[1]The law review literature was represented by the citations from the LexisNexis search. While all these materials were not reviewed in detail, several of the documents informed Chapter 3 of this report (The Legal Framework for Assessment of Eyewitness Identification).

using Boolean-logic-based search strategies designed to identify empirical research reports, review articles, systematic reviews, meta-analyses, and articles in law reviews and legal journals.

The committee concentrated its review on the subset of the bibliography deemed most important to its task, focusing more on the scientific literature than on the law review literature. These materials included meta-analyses and systematic reviews and primary research in neuroscience, statistics, and eyewitness identification. This report also was informed by several early foundational papers and written comments from, and presentations to, the committee by representatives from science, law enforcement, state courts and government, private organizations, and other interested parties. The comments and presentations revealed additional highly relevant new findings, some recently published or in press and others in submission. The agenda for each committee meeting is available in Appendix B. All materials submitted to the committee are retained in the Academies' public access file and are available upon request.

COMMITTEE ASSESSMENT

Many factors affect eyewitness accuracy. Some factors are related to protocols within the law enforcement and legal systems, while others are related to characteristics associated with the crime scene, perpetrator, and witness.

System variables are those that the criminal justice system can influence through the enforcement of standards and through education and training of law enforcement personnel in the use of best practices[2] and procedures (e.g., by specifying the content and nature of instructions given to witnesses prior to a lineup identification). Estimator variables include factors operating either at the time of the criminal event (relating to visual experience or memory encoding) or during the retention interval (the time between witnessing an event and the identification process). Specific examples include the eyewitness' level of stress or trauma at the time of the incident, the light level and nature of the visual conditions that affect visibility and clarity of a perpetrator's features, similarity of age and race of the witness and perpetrator, presence or absence of a weapon during the incident, and the physical distance separating the witness from the perpetrator.

A scientific consensus about the effects of some factors has emerged, but no such consensus exists for many other factors. One method of assessing scientific consensus is by surveys of experts. A 2001 survey collected

[2]As noted in Chapter 1, for the purposes of this report, the committee characterizes *best practice* as the adoption of standardized procedures based on scientific principles. The committee does not make any endorsement of practices designated as best practices by other bodies.

responses from 64 psychologists about their courtroom experiences and their opinions on 30 eyewitness-related phenomena to determine the "general acceptance" of these phenomena within the eyewitness identification research community.[3] General acceptance is relevant to whether scientific testimony is admissible as evidence in court (see Chapter 3). The survey revealed substantial agreement about which findings these experts felt were sufficiently reliable to present in court.[4]

The committee examined the scientific literature on eyewitness identification, focusing first on quantitative syntheses, largely systematic reviews and meta-analyses, which were identified in a comprehensive search of electronic databases designed to locate research on both estimator and system variables. In addition, primary research studies were identified in this database search, many of which were also highlighted in the relevant systematic reviews and meta-analyses. Finally, some researchers forwarded manuscripts to the committee that have been submitted for peer-review or are in press. In their examination of this body of literature, the committee examined the quality of the identified research and, where possible, worked to derive summary empirical generalizations related to variables of interest.

Quantitative Syntheses of Eyewitness Identification Research

The committee first evaluated the consistency of research findings across studies for system and estimator variables by studying published quantitative reviews of empirical research. Systematic reviews, which collect and appraise available research on specific hypotheses or research questions, are efforts to synthesize the effects of variables across studies. Within systematic reviews, meta-analysis is often, but not always, used to compute the effects of variables as well as to identify factors that explain differences across studies. When assumptions about consistency of data collected across studies are met, meta-analysis provides a quantitative summary of empirical findings by statistically averaging effect sizes across individual studies, thereby increasing the precision of the effect size estimate as well

[3]S. M. Kassin et al., "On the 'General Acceptance' of Eyewitness Testimony Research: A New Survey of the Experts," *American Psychologist* 56(5): 405–416 (2001).

[4]Kassin et al. also compared the reliability assessments of the 2001 survey to assessments from a similar 1989 survey and noted that, for the 17 propositions retested, there was a remarkable degree of consistency: "most experts saw as sufficiently reliable expert testimony on the wording of questions," lineup instructions, attitudes and expectations, the accuracy-confidence correlation, the forgetting curve, exposure time, and unconscious transference. "There was less, if any, consensus on the effects of color perception in monochromatic light," "observer training, high levels of stress, the accuracy of hypnotically refreshed testimony, and event violence." The authors observed that two phenomena were seen as significantly more reliable than had been the case when the initial survey was conducted: weapon focus effect and hypnotic suggestibility effects. See p. 410.

as the statistical power to detect effects. Done well, systematic reviews with or without meta-analysis provide evidence for practice and policy for such fields as health care,[5] crime and justice, social welfare, and education.[6] The utility of systematic reviews for informing practice and policy is predicated on the included studies being transparently reported, conducted so as to minimize risk of bias, and representing as complete a sample as possible of research conducted on the central question, including both published and unpublished studies. In turn, systematic reviews should specify inclusion criteria and data extraction procedures a priori, use independent and duplicate procedures for study selection and data extraction, rigorously evaluate potential biases in included studies, and interpret results of meta-analyses in terms that are useful to decision-makers. Further, meta-analyses should not be conducted outside the context of systematic reviews. In short, both systematic reviews and the studies they include need to be transparent and reproducible in order to best inform practice and policy decisions about eyewitness identification.

The committee examined quantitative reviews that covered decades of research on both estimator variables (exposure duration,[7] retention interval,[8] stress,[9] weapon focus,[10] own-race bias,[11] and own-age bias[12]) and system variables (identification test medium, i.e., live lineup versus photo array,[13]

[5]See the Cochrane Collaboration, available at: http://www.cochrane.org.

[6]See the Campbell Collaboration, available at: http://www.campbellcollaboration.org.

[7]B. H. Bornstein et al., "Effects of Exposure Time and Cognitive Operations on Facial Identification Accuracy: A Meta-Analysis of Two Variables Associated with Initial Memory Strength," *Psychology, Crime and Law* 18(5): 473–490 (2012).

[8]K. A. Deffenbacher et al., "Forgetting the Once-Seen Face: Estimating the Strength of an Eyewitness's Memory Representation," *Journal of Experimental Psychology: Applied* 14(2): 139–150 (2008).

[9]K. A. Deffenbacher et al., "A Meta-Analytic Review of the Effects of High Stress on Eyewitness Memory," *Law and Human Behavior* 28(6): 687–706 (2004).

[10]J. M. Fawcett et al., "Of Guns and Geese: A Meta-Analytic Review of the 'Weapon Focus' Literature," *Psychology, Crime and Law* 19(1): 35–66 (2013).

[11]C. A. Meissner and J. C. Brigham, "Thirty Years of Investigating the Own-Race Bias in Memory for Faces—A Meta-Analytic Review," *Psychology, Public Policy, and Law* 7(1): 3–35 (2001).

[12]M. G. Rhodes and J. S. Anastasi, "The Own-Age Bias in Face Recognition: A Meta-Analytic and Theoretical Review," *Psychological Bulletin* 138(1): 146–174 (2012).

[13]B. L. Cutler et al., "Conceptual, Practical, and Empirical Issues Associated with Eyewitness Identification Test Media," in *Adult Eyewitness Testimony: Current Trends and Developments*, ed. D. F. Ross (New York: Press Syndicate of the University of Cambridge, 1994), 163–181.

biased and unbiased lineup instructions,[14] post-identification feedback,[15] simultaneous versus sequential lineup presentation,[16] target absent versus target present lineups,[17] foil similarity,[18] blinding,[19] showup versus lineup,[20] prior mug shot exposure,[21] verbal description and identification,[22] and the cognitive interview[23]). Many of these quantitative reviews were published recently, with more than one-third published since 2010. However, none of the reviews met all current standards for conducting and reporting sys-

[14]S. E. Clark, "A Re-Examination of the Effects of Biased Lineup Instructions in Eyewitness Identification," *Law and Human Behavior* 29(4): 395–424 (2005). S. E. Clark, "Costs and Benefits of Eyewitness Identification Reform: Psychological Science and Public Policy," *Perspectives on Psychological Science* 7(3): 238–259 (2012). N. K. Steblay, "Social Influence in Eyewitness Recall: A Meta-Analytic Review of Lineup Instruction Effects," *Law and Human Behavior* 21(3): 283–297 (1997). N. K. Steblay, G. L. Wells, and A. B. Douglass, "The Eyewitness Post Identification Feedback Effect 15 Years Later: Theoretical and Policy Implications," *Psychology, Public Policy, and Law* 20(1): 1–18 (2014).

[15]S. E. Clark and R. D. Godfrey, "Eyewitness Identification Evidence and Innocence Risk," *Psychonomic Bulletin and Review* 16(1): 22–42 (2009). A. B. Douglass and N. K. Steblay, "Memory Distortion in Eyewitnesses: A Meta-Analysis of the Post-Identification Feedback Effect," *Applied Cognitive Psychology* 20(7): 859–869 (2006).

[16]Clark, "Costs and Benefits of Eyewitness Identification Reform." S. E. Clark, R. T. Howell, and S. L. Davey, "Regularities in Eyewitness Identification," *Law and Human Behavior* 32(3): 187–218 (2008). N. K. Steblay et al., "Eyewitness Accuracy Rates In Sequential and Simultaneous Lineup Presentations: A Meta-Analytic Comparison," *Law and Human Behavior* 25(5): 459–473 (2001). N. K. Steblay et al., "Seventy-two Tests of the Sequential Lineup Superiority Effect: A Meta-Analysis and Policy Discussion," *Psychology, Public Policy, and Law* 17(1): 99–139 (2011).

[17]Clark, "A Re-Examination of the Effects of Biased Lineup Instructions in Eyewitness Identification." Clark, Howell, and Davey, "Regularities in Eyewitness Identification." Clark and Godfrey, "Eyewitness Identification Evidence and Innocence Risk."

[18]Clark, "Costs and Benefits of Eyewitness Identification Reform." Clark and Godfrey, "Eyewitness Identification Evidence and Innocence Risk." Clark, Howell, and Davey, "Regularities in Eyewitness Identification." R. J. Fitzgerald et al., "The Effect of Suspect-Filler Similarity on Eyewitness Identification Decisions: A Meta-Analysis," *Psychology, Public Policy, and Law* 19(2): 151–164 (2013). S. L. Sporer et al., "Choosing, Confidence, and Accuracy: A Meta-Analysis of the Confidence-Accuracy Relation in Eyewitness Identification Studies," *Psychological Bulletin* 118(3): 315–327 (1995).

[19]Clark, "Costs and Benefits of Eyewitness Identification Reform."

[20]Clark, "Costs and Benefits of Eyewitness Identification Reform." N. K. Steblay et al., "Eyewitness Accuracy Rates in Police Showup and Lineup Presentations: A Meta-Analytic Comparison," *Law and Human Behavior* 27(5): 523–540 (2003).

[21]K. A. Deffenbacher et al., "Mugshot Exposure Effects: Retroactive Interference, Mugshot Commitment, Source Confusion, and Unconscious Transference," *Law and Human Behavior* 30(3): 287–307 (2006).

[22]C. A. Meissner, S. L Sporer, and K. J. Susa, "A Theoretical Review and Meta-Analysis of the Description-Identification Relationship in Memory for Faces," *European Journal of Cognitive Psychology* 20(3): 414–455 (2008).

[23]A. Memon et al., "The Cognitive Interview: A Meta-Analytic Review and Study Space Analysis of the Past 25 Years," *Psychology, Public Policy, and Law* 16(4): 340–372 (2010).

tematic reviews,[24] and few met even a majority of these standards, making assessment of the credibility of their findings problematic.

After examining the reviews, the committee concluded that the findings may be subject to unintended biases and that the conclusions are less credible than was hoped. In many cases, the data from the studies cited were not readily available or were not clearly presented. Nevertheless, these reviews were helpful in highlighting some of the issues associated with specific research questions and in identifying primary studies that might be both credible and important.

RESEARCH STUDIES ON SYSTEM VARIABLES

After its assessment of the systematic reviews and meta-analytic studies, the committee's review focused on the most-studied system variables. Key system variables, such as lineup procedures (e.g., simultaneous vs. sequential lineups, blinded vs. non-blinded lineup administration) and the collection/use of witness confidence statements, can have a marked influence over the validity of eyewitness identifications. In the following section, one of the most important practical issues raised by this influence is addressed: What is the best way to evaluate the effects of system variables on the diagnostic accuracy of eyewitness reports, and how might we use the results of such an evaluation to optimize the states of key system variables and thus maximize performance of an eyewitness? This question is, in principle, relevant to all system variables, but we address it first in the timely and controversial context of simultaneous versus sequential lineup presentations and in the role of eyewitness confidence judgments in evaluation of identification performance. This examination of lineup procedures and confidence reports is followed by a brief discussion of the effects on eyewitness performance of another important system variable: the extent and content of communications between the witness and the larger community (law enforcement, legal defense, the press, family and friends, etc.).

Evaluating Eyewitness Performance

Perhaps the most important empirical question that can be asked about eyewitness identification is: How well do witnesses perform as a function of different system and estimator variables? For example, do factors such as the structure of a lineup, stress, or weapon focus affect the ability of

[24]See, e.g., Institute of Medicine, *Finding What Works in Health Care: Standards for Systematic Reviews* (Washington, DC: The National Academies Press, 2011) and B. J. Shea et al., *Development of AMSTAR: A Measurement Tool to Assess the Methodological Quality of Systematic Reviews*, BMC Medical Research Methodology 2007, 7:10 doi:10.1186/1471-2288-7-10.

a witness to provide reliable information? If so, what practices will yield the best performance? The issues are multifaceted, and the answers likely depend upon many factors. Given the complexity of these issues, the experimental literature to date has focused largely on one of the more tractable problems: How do different lineup identification procedures affect witness identifications? The committee will use this focus (and its eminent practical relevance) to illustrate how one might go about evaluating eyewitness performance generally.

Most lineup identification procedures take one of two forms: *simultaneous* or *sequential*. In a simultaneous procedure, the witness views all individuals in the lineup at the same time and either identifies one (or more) as the perpetrator or reports that the person she or he saw at the crime scene was not in the lineup. In a sequential procedure, the witness views individuals one at a time and reports whether or not each one is the person from the crime scene. Rigorous evaluation of eyewitness identification performance as a function of these two procedures requires a formal understanding of the task that the witness confronts, and it requires criteria for assessing the outcome.

The task of a witness viewing a lineup is an example of what is known as a binary classification problem.[25] Each eyewitness faces two possible (binary) states associated with each person in the lineup (guilt or innocence), and the witness must assign each person to one of two classes (guilty or innocent). For each decision, the witness can be correct or incorrect, yielding four possible outcomes: a correct classification as guilty ("hit"), an incorrect classification as guilty ("false alarm"), a correct classification as innocent ("correct rejection"), and an incorrect classification as innocent ("miss"). These outcomes are commonly presented in a contingency table[26] (see Figure 5-1), and the frequencies in each part of that table are the raw data used to evaluate performance on a binary classification task, such as eyewitness identification.[27]

There are many different performance measures that can be derived from data of this sort—indeed, the fields of statistical classification and machine learning are replete with tools for the evaluation of binary classifiers.[28]

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[25]The binary classifier in this context is defined as the witness operating under a specific set of conditions, such as lineup procedures.

[26]Also termed "confusion matrix."

[27]The prevalence or "base-rate"—the fraction of individuals in each category (guilty or innocent, in the eyewitness problem) in the population is also a factor that may come into play when evaluating binary classification performance.

[28]See, e.g., T. Hastie, R. Tibshirani, and J. H. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction* (New York: Springer, 2009) and A. Smola and S. V. N. Vishwanathan, *Introduction to Machine Learning* (Cambridge: Cambridge University Press, 2008).

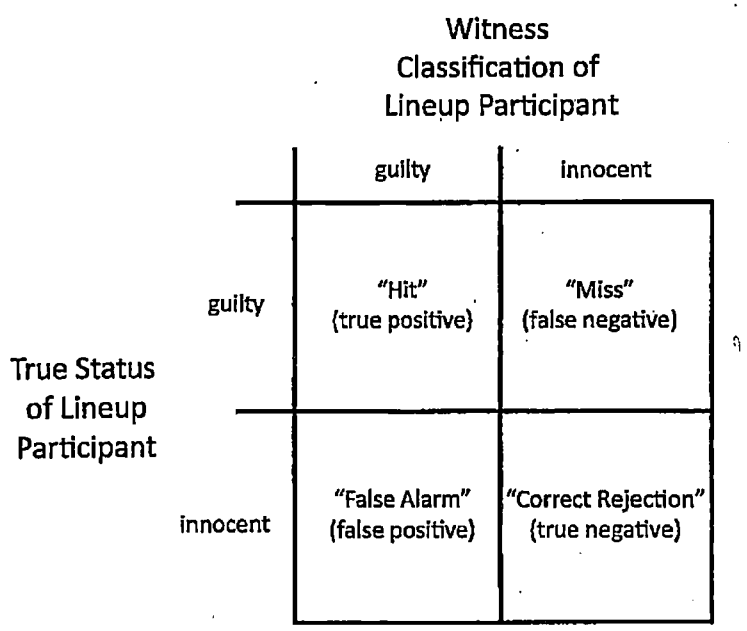


FIGURE 5-1 Contingency table for possible eyewitness identification outcomes.
SOURCE: Courtesy of Thomas D. Albright.

The preferred measure will depend to a large degree upon the criteria one adopts for performance evaluation.

Perhaps the simplest measure of binary classification performance is the ratio of hit rates (HR) to false alarm rates (FAR), i.e., HR/FAR.[29] The magnitude of this measure, which is known in the eyewitness identification literature as the "diagnosticity ratio," is proportional to the likelihood that a classification is correct, i.e., that the person identified as guilty is actually guilty.[30] The diagnosticity ratio is appealing if the most critical criterion is avoiding erroneous identifications.

[29]The "rate" associated with each cell of the contingency table is computed as the number of counts within that cell (e.g., number of people correctly classified as guilty) divided by the number of instances that are truly in that class (e.g., total number of guilty people being classified). Thus, hit rates (HR) = number of hits / (number of hits+number of misses), and false alarm rate (FAR) = number of false alarms / (number of false alarms+number of correct rejections).

[30]The "diagnosticity ratio" is also known in other disciplines by other names; e.g., "positive likelihood ratio" or "LR+ = Likelihood Ratio of a Positive Call;" see Peter Lee, *Bayesian Statistics: An Introduction* (Chichester: Wiley, 2012), Sec 4.1.

Not surprisingly, the diagnosticity ratio was adopted in pioneering efforts to identify lineup conditions that would yield better witness identification performance.[31] Most laboratory-based studies and meta-analyses of the effects of lineup procedures on eyewitness identification performance show that, with standard lineup instructions informing the witness that the perpetrator may or may not be present, the sequential procedure produces a higher diagnosticity ratio.[32] That is, when considering only those cases in which a witness actually selects someone from a lineup, the ratio of correct to false identifications is commonly higher with the sequential than with the simultaneous procedure.[33]

A higher diagnosticity ratio could result from a higher hit rate, a lower false alarm rate, or some combination of the two. Some early reports suggested that sequential procedures (relative to simultaneous) lead to fewer false alarms without changing the frequency of hits, which would result in a higher diagnosticity ratio.[34] More recent laboratory-based studies and meta-analyses typically show that sequential procedures (relative to simultaneous) are associated with a somewhat reduced hit rate accompanied by a larger reduction in the false alarm rate, thereby resulting in diagnosticity ratios higher than those yielded by simultaneous procedures.[35] In other

[31]R. C. L. Lindsay and G. L. Wells, "Improving Eyewitness Identifications from Lineups: Simultaneous Versus Sequential Lineup Presentation," *Journal of Applied Psychology* 70(3), 556–564 (1985).

[32]Steblay et al. "Eyewitness Accuracy Rates in Sequential and Simultaneous Lineup Presentations." Steblay, et al., "Seventy-two Tests of the Sequential Lineup Superiority Effect." S. D. Gronlund et al., "Robustness of the Sequential Lineup Advantage," *Journal of Experimental Psychology: Applied* 15(2): 140–152 (2009). S. D. Gronlund, J. T. Wixted, and L. Mickes, "Evaluating Eyewitness Identification Procedures Using ROC Analysis," *Current Directions in Psychological Science* 23(1): 3–10 (2014).

[33]But see C. A. Carlson, S. D. Gronlund, and S. E. Clark, "Lineup Composition, Suspect Position, and the Sequential Lineup Advantage," *Journal of Experimental Psychology-Applied* 14(2): 118-128 (2008), for a counterexample. Also, Clark, Moreland, and Gronlund have demonstrated that the accuracy advantage of sequential lineups as measured by diagnosticity ratios has decreased over time since the original report. Reanalysis of diagnosticity data for sequential studies showed slight, non-significant decreases in correct identification effects and increases in false identification effects, which together combine to produce a significant decrease in the advantage of sequential over simultaneous lineup methods. See S. E. Clark, M. B. Moreland, and S. D. Gronlund, "Evolution of the Empirical and Theoretical Foundations of Eyewitness Identification Reform," *Psychonomic Bulletin and Review* 21(2): 251–267 (2014).

[34]R. C. L. Lindsay, "Applying Applied Research: Selling the Sequential Lineup," *Applied Cognitive Psychology* 13(3): 219–225 (1999). G. L. Wells, S. M. Rydell, and E. P. Seelau, "The Selection of Distractors for Eyewitness Lineups," *Journal of Applied Psychology* 78(5): 835–844 (1993).

[35]A recent field-based study comparing sequential to simultaneous procedures in a limited number of jurisdictions computed the diagnosticity ratio using filler identifications as the false alarm rate (because the innocence or guilt of the suspect is unknown in such situations). See G. L. Wells, N. K. Steblay, J. E. Dysart, "Double-Blind Photo-Lineups Using Actual

words, when using a single diagnosticity ratio as a measure of eyewitness performance, the sequential procedure (relative to simultaneous) comes closer to satisfying the popular criterion that those identified as guilty are actually guilty. In light of these findings, many policy makers have advocated sequential procedures, and those procedures have been adopted by law enforcement in many jurisdictions.

While policy decisions and practice have been influenced by the aforementioned studies, there are other criteria worthy of consideration when evaluating eyewitness performance. One alternative is revealed by asking *why* the diagnosticity ratio changes across lineup conditions. This question can be addressed given a plausible model of the mechanisms underlying human recognition memory. Most models of recognition memory are based on the idea that a cue (e.g., a face in a lineup) results in the retrieval of information stored in memory (see Chapter 4). When the retrieved information provides enough evidence to satisfy the observer, they make an identification—that is, they decide that the stimulus is "recognized." Explicit in this model are two important parameters: the observer's memory sensitivity (that is, the "discriminability" between the strength of memory evidence elicited by a previously encountered stimulus and that elicited by novel stimuli), and the degree of evidence that the observer requires to make an identification ("response criterion" or "bias") (see Box 5-1).

The first of these two parameters—discriminability—is important for evaluating eyewitness performance. It tells whether a difference in performance under different task conditions reflects a true improvement in memory-based discrimination, i.e., *an improvement in the strength of the observer's retrieved memory evidence of the perpetrator.*

The fact that these two measures (the likelihood that an identified person is guilty vs. discriminability) do not assess the same thing is counterintuitive—a fact that has generated controversy in the field of eyewitness

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Eyewitnesses: An Experimental Test of a Sequential versus Simultaneous Lineup Procedure," *Law and Human Behavior*, 15 June 2014, doi: 10.1037/lhb0000096. When computed in this manner, the data revealed a modest diagnosticity ratio advantage for the sequential procedure. However, Amendola and Wixted re-analyzed a subset of the data for which proxy measures of ground truth were available [K. Amendola and J. T. Wixted, "Comparing the Diagnostic Accuracy of Suspect Identifications Made by Actual Eyewitnesses from Simultaneous and Sequential Lineups," accepted by *Journal of Experimental Criminology* (2014)]. Their analyses suggested that identification of innocent suspects is less likely and identification of guilty suspects is more likely when using the simultaneous procedures. While future field studies are needed, these latter findings raise the possibility that diagnosticity is higher for the simultaneous procedure. See also Clark, Moreland, and Gronlund, who report that published diagnosticity ratios have changed over time, reflecting a significant decrease in the advantage of sequential over simultaneous lineup procedures. (Clark, Moreland, and Gronlund, "Evolution of the Empirical and Theoretical Foundations of Eyewitness Identification Reform.")

BOX 5-1
The Influences of Discriminability and Response Bias on Human Binary Classification Decisions

All human decisions about the classification of objects based on memory—including a witness' classifications of guilt or innocence for faces in a lineup, an individual's decision as to whether a piece of luggage is his or her own, a botanist's recognition of a specific type of fern, a radiologist's detection of a tumor in a mammogram, or the determination of the sex of a newly-hatched chicken—can be distilled down to the influence of two factors that are rooted in causal models of recognition memory: the degree to which the relevant objects are discriminable by the decider (the decider's *sensitivity* to the difference between them), and the decider's criterion for making a decision (response bias, or the decider's degree of *specificity* in making choices).* There are, of course, many other variables that will affect the outcome (e.g., levels of stress, attentional focus, potential rewards or expectations), but all of these are believed to exert their influence over memory-based classification decisions by affecting discriminability and/or response bias.

To illustrate the distinction between discrimination and response bias as applied to a real-world decision problem, consider how an audiologist conducts a hearing test. In a hearing test, an individual might be asked to detect sounds along a continuum of loudness and to indicate when a sound is present. The audiologist wants to know how well someone can discriminate presence versus absence of a sound, but that assessment is complicated by the criterion people use when deciding to say that they heard a sound (response bias). Some people are hesitant to respond positively, saying "I hear it" only when they are absolutely certain ("conservative" responders). Others are more willing to respond positively, saying "I hear it" with less information and greater uncertainty ("liberal" responders). Those with a conservative bias are less likely to report hearing a sound in general, so they will have both fewer correct detections ("hits") and fewer overt mistakes ("false alarms"). By contrast, those with a liberal bias are more likely to say that they heard a sound, so they will have more hits but also more false alarms. Importantly, this can occur even if the conservative and liberal responders do not differ in their ability to discriminate the presence or absence of sound.

*See, e.g., W. P. Banks, "Signal Detection Theory and Human Memory," *Psychological Bulletin* 74(2): 81–99 (1970); J. P. Egan, *Recognition Memory and the Operating Characteristic* (Bloomington: Indiana University Hearing and Communication Laboratory, 1958); D. M. Green and J. A. Swets, *Signal Detection Theory and Psychophysics* (New York: Wiley, 1966).

identification research.[36] Intuitively, if sequential lineups yield a higher likelihood that an identified person is guilty (as quantified by a higher diagnosticity ratio), then it seems as if that procedure yields objectively better performance. The problem with this intuition is that it fails to take into account the second of the two parameters of recognition memory models—the response bias or degree of evidence that the observer finds acceptable to make an identification. This parameter, which is distinct from discriminability, reflects the witness' tendency to pick or not to pick someone from the lineup. If a witness sets a high bar for acceptable evidence—a conservative bias—then he or she will be unlikely to select anyone from the lineup (low pick frequency), meaning that they will have more misses (will be more likely to fail to select the suspect because they are less likely to make a selection at all) and fewer false alarms.

Conversely, if a witness sets a low bar for acceptable evidence—a liberal bias—then she or he will be more likely to make a selection from the lineup (a high pick frequency), meaning he or she will have more hits and will make more false identifications. Differences in pick frequency can, and generally do, lead to differences in the ratio of hit rates to false alarm rates; all else being equal, the diagnosticity ratio will be higher for a conservative bias than for a liberal bias.[37] In other words, simply by inducing a witness to adopt a more conservative bias, it is possible to increase the likelihood that an identified person is actually guilty. Importantly, this may be true even if the procedure yields no better, or potentially worse, discriminability.[38]

Despite its merits, a single diagnosticy ratio thus conflates the influences of discriminability and response bias on binary classification, which muddies the determination of which procedure, if any, yields objectively better discriminability in eyewitness performance. To overcome this problem, some investigators have recently adopted a technique from signal detection

[36] See, e.g., J. T. Wixted and L. Mickes, "The Field of Eyewitness Memory Should Abandon Probative Value and Embrace Receiver Operating Characteristic Analysis," *Perspectives on Psychological Science* 7(3): 275-278 (2012); Clark, "Costs and Benefits of Eyewitness Identification Reform"; G. L. Wells, "Eyewitness Identification Probative Value, Criterion Shifts, and Policy Regarding the Sequential Lineup," *Current Directions in Psychological Science* 23(1): 11–16 (2014); and Steblay, et al. "Seventy-two Tests of the Sequential Lineup Superiority Effect."

[37] The sole exception to this rule is the case in which classifications are made at chance level of performance, i.e., when the observer exhibits no ability to discriminate.

[38] L. Mickes, H. D. Flowe, and J. T. Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory: Comparing the Diagnostic Accuracy of Simultaneous vs. Sequential Lineups," *Journal of Experimental Psychology: Applied* 18 (4): 361–376 (2012). C. A. Meissner et al., "Eyewitness Decisions In Simultaneous and Sequential Lineups: A Dual Process Signal Detection Theory Analysis," *Memory and Cognition* 33(5): 783–792 (2005). M. A. Palmer and N. Brewer, "Sequential Lineup Presentation Promotes Less-Biased Criterion Setting but Does Not Improve Discriminability," *Law and Human Behavior* 36(3): 247–255 (2012).

theory, which distinguishes the relative influences of discriminability and bias on binary classification.[39] This technique involves analysis of Receiver Operating Characteristics (see Box 5-2). ROC analysis has been used extensively in multiple contexts of human decision-making, notably in basic research on visual perception and memory and applied studies of medical diagnostic procedures.[40] In essence, ROC analysis examines diagnosticity ratios integrated over different response biases. This approach to eyewitness research has been promoted based on the claim that it can enable lineup procedures to be evaluated by their effect on discrimination, separate from response bias, and—importantly—because the dimensions of analysis (discriminability and response bias) correspond to the mechanistic parameters of causal models of human recognition memory.

Use of ROC analysis to evaluate eyewitness performance requires calculating the diagnosticity ratio for different response bias conditions (see Box 5-2). Using expressed confidence level (ECL) as a proxy for response bias (see below), a small set of recent studies using ROC analysis has reported that discriminability (area under the ROC curve) for simultaneous lineups is as high, or higher, than that for sequential lineups.[41] In other words, when eyewitness identification performance is evaluated based on a criterion of bias-free discriminability, the results differ from those based on a single diagnosticity ratio, and they do so because the latter fails to account for response bias.

Looking broadly at the many empirical studies that have used a single diagnosticity ratio to evaluate eyewitness performance, as well as the more recent findings using ROC analysis, it appears that the practical advantage of one lineup procedure over another depends to a large degree upon the performance criterion that one adopts. From the perspective of many, the ideal lineup procedure would elicit a conservative bias (thus reducing false identifications) and high discriminability (that is, optimizing memory sensitivity). If there exists no discriminability advantage for one lineup

[39]D. M. Green and J. A. Swets, *Signal Detection Theory and Psychophysics* (New York: Wiley, 1966); D. McNicol, *A Primer of Signal Detection Theory* (London: George Allen and Unwin, 1972).

[40]J. A. Swets, "ROC Analysis Applied to the Evaluation of Medical Imaging Techniques," *Investigative Radiology* 14(2): 109–121 (1979).

[41] Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory." C. A. Carlson and M. A. Carlson, "An Evaluation of Lineup Presentation, Weapon Presence, and a Distinctive Feature Using ROC Analysis," *Journal of Applied Research in Memory and Cognition* 3(2): 45–53 (2014). D. G. Dobolyi and C. S. Dodson, "Eyewitness Confidence in Simultaneous and Sequential Lineups: A Criterion Shift Account for Sequential Mistaken Identification Overconfidence," *Journal of Experimental Psychology: Applied* 19 (4): 345–357 (2013). S. D. Gronlund et al., "Showups Versus Lineups: An Evaluation Using ROC Analysis," *Journal of Applied Research in Memory and Cognition* 1(4): 221–228 (2012).

BOX 5-2
Analysis of Receiver Operating Characteristics (ROCs)

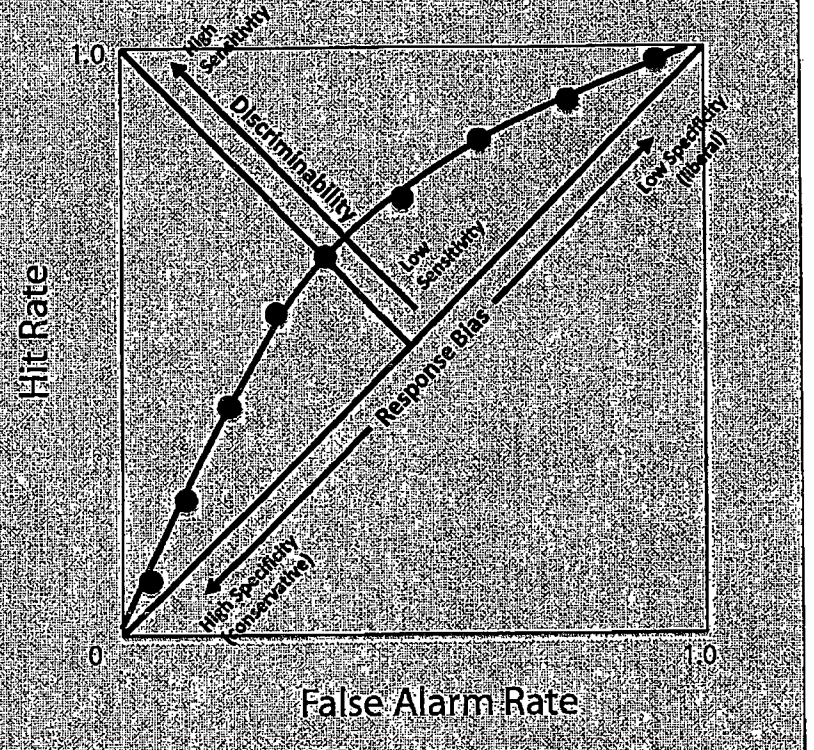
Binary classification decisions by human observers are affected by both discriminability (the observer's sensitivity to the difference between target and non-targets) and response bias (the observer's degree of specificity in making a response). Analysis of Receiver Operating Characteristics (ROCs) is a method from signal detection theory that enables one to distinguish the relative influences of discriminability and response bias on binary classification decisions. ROC analysis is performed by plotting the frequency of decisions that are hits (correctly detecting a target) versus the frequency of decisions that are false alarms (incorrectly classifying a non-target as a target).

The positive diagonal in an ROC plot (see figure next page) corresponds to response bias, moving from high specificity at the lower left corner (no detection of targets (hit rate = 0) and no incorrect attribution of non-targets as targets (false alarm rate = 0)), to low specificity at the upper right corner (all targets detected (hit rate = 1.0) and all non-targets attributed as targets (false alarm rate = 1.0)). Because all points along this positive diagonal reflect equal ratios of hits to false alarms, they vary in response bias (i.e., the frequency of lineup picks, or "pick frequency"), but they do not manifest differences in discriminability. The negative diagonal in an ROC plot corresponds, by contrast, to discriminability, moving from chance discriminability at the intersection with the positive diagonal, where hits and false alarms are equally likely, to the highest discriminability in the upper left corner, where all targets are detected (hit rate = 1.0), but no non-targets are attributed as targets (false alarm rate = 0).

To see how measured hit and false alarm rates vary over different conditions of discriminability and response bias in laboratory experiments, one can manipulate or estimate these conditions and record a diagnosticity ratio (HR/FAR) for each condition. The typical result is a set of diagnosticity ratios that, when plotted in the ROC space (represented by the dots in the figure at right), form a curve spanning from lower left to upper right. The extent to which that curve deviates (bows above and away) from the positive diagonal is a quantitative measure of discriminability (assessed as the area under the curve) for which response bias has been factored out.

ROC analysis has been used extensively in basic and applied research on recognition memory. In these experiments, response bias is sometimes manipulated explicitly by encouraging observers to be more or less selective in

their responses. Frequently, however, "expressed confidence level" (ECL)—the confidence that an observer holds in his or her classification—is used as a proxy for response bias, based on the assumption that more confident observers are likely to be more specific (conservative) in their responses, whereas less confident observers are likely to be less specific (liberal) in their responses.



Receiver Operating Characteristic (ROC) curve.
SOURCE: Courtesy of Thomas D. Albright.

procedure over another,[42] then eyewitness performance may benefit from any procedure (such as sequential) that elicits a more conservative response bias.[43] But one can only make that judgment after having applied an empirical test to determine whether a procedure offers a discriminability advantage. Future research might explore the possibility that other methods of inducing a conservative response bias (such as verbal instructions to the witness to be cautious in making an identification) might be combined with procedures that improve discriminability in order to optimize eyewitness identification performance.

Perhaps the greatest practical benefit of recent debate over the utility of different lineup procedures is that it has opened the door to a broader consideration of methods for evaluating and enhancing eyewitness identification performance. ROC analysis is a positive and promising step with numerous advantages. For example, the area under the ROC curve is a single-number index of discriminability. Moreover, this index reflects a parameter-free approach to binary classification performance; the outcome is entirely data-dependent and thus identical across all users drawing from

[42]The committee notes that some of the few recent reports using ROC analysis indeed claim improved discriminability for simultaneous lineup conditions, but the reported discriminability improvements are small.

[43]In reality, a more conservative bias may not always be beneficial, and whether it is or not depends upon a number of factors that have an impact distinct from diagnostic accuracy and are difficult to quantify. All else being equal, the "best" response bias will be one that maximizes the "expected value" of the outcome (Green and Swets, *Signal Detection Theory and Psychophysics*; Swets, "ROC Analysis Applied to the Evaluation of Medical Imaging Techniques"). For the problem of eyewitness identification, the response bias that maximizes expected value can be computed from the prevalence of guilty suspects in lineups and from societal *values* or *costs* associated with each of the possible eyewitness decisions (errors and correct assignments). Reliable data on prevalence are difficult to come by, and value/cost quantities are difficult to assign and likely to vary significantly across crimes and cultures. One can nonetheless gain an intuition for how these factors might define the best response bias conditions. Consider, for example, the consequences of decreasing the prevalence of guilty suspects in lineups. In this case, expected value can be maximized by inducing a conservative bias—i.e., if innocence is a priori likely, then there is value gained by being more selective in your response. Similarly, the optimal response bias will depend upon normative costs associated with different types of eyewitness errors. Generally speaking, if a society places greater emphasis on not identifying the innocent, relative to failing to identify the guilty, then expected value can be increased by inducing a more conservative response bias. But the opposite would be true if there were greater societal pressures for identifying the guilty, relative to protecting the innocent. Although an understanding of the relationship between response bias and expected value is important, expected value in this case has little to do with the diagnostic accuracy of an eyewitness report. But it does nonetheless bear on decisions about which lineup procedure should be employed.

the same data set.[44] Most importantly for its application to the problem of evaluating eyewitness performance, the ROC approach possesses a distinct advantage because the dimensions of analysis—discriminability and response bias—map directly onto the mechanistic parameters of causal models of human recognition memory (see Chapter 4). In other words, the approach affords insight into and quantification of the sensory and cognitive processes that are believed to underlie memory-based classification decisions (see Box 5-1), such as eyewitness identifications.

Despite these merits, as a general statistical procedure for evaluation of binary classification performance and as a tool for evaluation of eyewitness performance, the ROC approach has some well-documented quantitative shortcomings. For example, ROC analysis depends on the ability to manipulate response bias or to estimate it from some other variable, and in the case of eyewitness identification that ability has been the subject of some debate. Recent studies have used expressed confidence level (ECL)—a measure of a witness' confidence in his or her selection—as a proxy for response bias,[45] based on the common-sense logic that a witness who has high confidence in their lineup selection should manifest a more conservative response bias than a witness who selected someone from the lineup despite lacking confidence in that selection (i.e., someone who made a selection even though they were not certain—a liberal response bias). This proxy relationship is inherently noisy within individuals, and the noisy relationship is exacerbated by the fact that the eyewitness identification ROC is population-based; individual data points are obtained from different people who may scale their confidence reports differently.[46] On the other hand, it is empirically clear that, when scaled appropriately (within and across individuals), different levels of expressed confidence do, in fact, correspond to different pick frequencies and response biases.[47]

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[44]Green and Swets, *Signal Detection Theory and Psychophysics*. D. J. Hand, "Measuring Classifier Performance: A Coherent Alternative to the Area under the ROC Curve," *Machine Learning* 77, 103–123 (2009).

[45]See, e.g., N. Brewer and G. L. Wells, "The Confidence-Accuracy Relationship in Eyewitness Identification: Effects of Lineup Instructions, Foil Similarity, and Target-Absent Base Rates," *Journal of Experimental Psychology: Applied* 12(1): 11–30 (2012); Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory"; and Carlson and Carlson, "An Evaluation of Lineup Presentation."

[46]ECL is affected by over-confidence and under-confidence at the individual level, and the current implementation of the ROC approach, combining results across subjects, does not build this measurement error into the analysis or the comparison of empirical ROC curves. See Appendix C.

[47]See, e.g., Table 1 of Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory," which summarizes confidence ratings, hit rates, false alarm rates, and diagnosticity ratios (HR/FAR) derived from data published in Brewer and Wells, "The Confidence-Accuracy Relationship in Eyewitness Identification." Brewer and Wells employed

An additional prerequisite for the use of ECL as a measure of response bias is that an orderly relationship exists between confidence and accuracy—that witnesses expressing greater confidence are more likely to be accurate in their identifications. Although this hypothesis conforms to intuition,[48] the existence of a significant confidence–accuracy relationship has been challenged repeatedly over the years.[49] Recent evidence, however, suggests ways of improving the confidence–accuracy relationship (and obtaining more reliable measurements of it).[50] While the ECL measure thus has potential, more research on this and other possible methods of estimating or controlling response bias is warranted to support efforts to extract a bias-free measure of discriminability.

Another technical concern raised by the use of ROC analysis to evaluate eyewitness identification performance is that it relies on a *partial*, rather than full, area under the ROC curve measure (see Box 5-2) as an index of discriminability that is separate from response bias. This is necessitated by the fact that the highest false alarm rates in eyewitness identification data are commonly well below 1.0, even under the most liberal response bias

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a "confidence calibration" technique to normalize scaling of expressed confidence across witnesses. Both hit rates and false alarm rates declined steeply—implying an increasingly conservative response bias—as confidence levels increased. Diagnosticity ratios increased monotonically with increasing confidence. An identical pattern can be seen in Table 3 of Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory." See also H. L. Roediger III, J. T. Wixted, and K. A. DeSoto, "The Curious Complexity Between Confidence and Accuracy in Reports from Memory," in *Memory and Law,* ed. L. Nadel and W. Sinnott-Armstrong (Oxford: Oxford University Press, 2012), 97.

[48]K. A. Deffenbacher and E. F. Loftus, "Do Jurors Share a Common Understanding Concerning Eyewitness Behavior?," *Law and Human Behavior 6*: 15–30 (1982); and G. L. Wells, T. J. Ferguson, and R. C. L. Lindsay, "The Tractability of Eyewitness Confidence and Its Implication for Triers of Fact," *Journal of Applied Psychology* 66: 688–696 (1981).

[49]G. L. Wells and D. M. Murray, "Eyewitness Confidence," in *Eyewitness Testimony: Psychological Perspectives*, ed. G. L. Wells and E. F. Loftus (New York: Cambridge University Press, 1984). B. L. Cutler and S. D. Penrod, *Mistaken Identification: The Eyewitness, Psychology, and the Law* (Cambridge: Cambridge University Press, 1995). R. K. Bothwell, K. A. Deffenbacher, and J.C. Brigham, "Correlation of Eyewitness Accuracy and Confidence: Optimality Hypothesis Revisited," *Journal of Applied Psychology* 72:691–695 (1987). S. L. Sporer et al., "Choosing, Confidence, and Accuracy: A Meta-Analysis of the Confidence-Accuracy Relation in Eyewitness Identification Studies," *Psychological Bulletin* 118(3): 315–327 (1995). T. A. Busey et al., "Accounts of the Confidence-Accuracy Relation in Recognition Memory," *Psychonomic Bulletin and Review* 7(1): 26-48 (2000).

[50]N. Brewer and G. L. Wells, "The Confidence-Accuracy Relationship in Eyewitness Identification. P. Juslin, N. Olsson, and A. Winman, "Calibration and Diagnosticity of Confidence in Eyewitness Identification: Comments on What Can Be Inferred From the Low Confidence-Accuracy Correlation," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 22(5): 1304–1316 (September 1996). Roediger, Wixted, and DeSoto, "The Curious Complexity between Confidence and Accuracy." Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory."

conditions.[51] In practice, partial area under the curve is computed by truncating the ROC curve at the highest false alarm rate obtained. Because the standard error of the partial area under the curve measure depends upon the degree of truncation, accuracy of this discriminability measure can easily vary across conditions and across studies, making the interpretation difficult.[52]

While ROC analysis has many recognized merits for the evaluation of binary classification, the residual concerns associated with its typical use for evaluating eyewitness performance merit consideration of other statistical approaches to this problem. As noted above, many methods have been proposed—and adopted in specific applications—for evaluation of binary classification performance.[53] The committee knows of no instance in which any of these alternative methods has been applied to the problem of eyewitness identification. Moreover, because they have not been vetted, the committee is not in a position to endorse any specific statistical tool, the committee nevertheless encourages a general exploration of these alternatives. These alternatives may have their own share of unforeseen problems, and/or the performance criteria employed by them may bear no meaningful relationship to the sensory and cognitive processes involved in eyewitness identification. Nonetheless, some of these methods may provide greater insight into the factors that affect eyewitness identification performance and may, in turn, suggest ways of improving performance. To illustrate this opportunity by example, we consider the following possibilities.

It has been argued that a basic weakness of the existing ROC approach to binary classification performance results from the fact that, in principle

[51]Carlson and Carlson, "An Evaluation of Lineup Presentation." Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory."

[52]Along the same lines, accuracy of discriminability measures derived from ROC studies may be called into question when those studies do not take into account uncertainty in the data used to construct the ROC curves; see Appendix C. An argument has also been made that the area under the ROC curve can be a flawed metric for comparing binary classification conditions when the *costs* of classification errors are not precisely known and are different for different conditions (Hand, "Measuring Classifier Performance"). The costs of classification errors may be similar across some lineup comparisons and across some conditions of other systems variables, and for others they may be different. But for the most part they are not precisely known, and this is thus a topic that deserves greater attention given the growing use of ROC-based evaluation of eyewitness identification performance.

[53]Numerous methods for the evaluation of binary classifiers have been developed and applied in the field of machine learning, which seeks to optimize autonomous classification devices (such as, for example, the fingerprint lock access control on a smart phone, which must quickly and reliably distinguish the finger from another). This field has a long and rich history, and candidate methods are summarized in several texts on statistical classification and machine learning, such as Hastie, Tibshirani, and Friedman, *The Elements of Statistical Learning* and A. Smola and S. V. N. Vishwanathan, *Introduction to Machine Learning* (Cambridge: Cambridge University Press, 2009).

(and in practice under certain commonly unrecognized conditions), the area under the ROC curve is dependent on imprecise assumptions about the costs of classification errors across different classification conditions.[54] One might suppose, for example, that the cost of a miss for a crime of murder is greater than the cost of a miss for a stolen car. But without a precise understanding of these relative decision costs, the area under the ROC curve measure can be incoherent, in that it depends as much on the classification conditions as it does on the sensitivity of the classifier. An alternative method has been proposed to address this problem—derivation of the "H measure"—that enables the performance of binary classifiers to be compared using a common metric that is independent of the cost distributions for different types of classification errors.[55] The committee supports exploration of this alternative.

Another avenue for exploration emerges from the fact that the literature evaluating eyewitness identification performance has focused exclusively on the positive predictive value (PPV) of a witness' classification as guilty. For a given response bias, PPV is related to the diagnosticity ratio, in that, given equal prevalence of the culprit in two conditions (e.g., lineup procedures) being compared, a higher diagnosticity ratio leads to a higher PPV. As discussed above, the diagnosticity ratio is a critical piece of information in efforts to evaluate eyewitness performance. As for any binary classification, however, there is also information associated with a *negative* response, which is the predictive value of a classifier's assertion that a target is *not* present (in the eyewitness case, the witness' assertion of innocence). This negative predictive value (NPV) is related to a different ratio of decisions, namely (1-HR)/(1-FAR),[56] in that, given equal prevalence of the target in the two procedures being compared, higher values of this ratio correspond to higher values of NPV.

While NPV is commonly used to evaluate the accuracy of human classification decisions, such as in medical diagnosis, and is a source of information that may similarly be of additional value in efforts to evaluate lineup procedures, it has been largely neglected in the field of eyewitness identification.[57] One might hold the intuition that PPV and NPV are monotonically related to one another—believing that the likelihood that the

[54]See Hand, "Measuring Classifier Performance."

[55]Ibid.

[56]The reciprocal of this ratio is called the "negative likelihood ratio." See, e.g., T. Hoffmann, S. Bennett, and C. del Mar, *Evidence-Based Practice Across the Health Professionals* (Chatswood: Elsevier Australia, 2009).

[57]It seems likely that this neglect stems from the fact that the primary concern in eyewitness identification has been on incorrect assertions of guilt (i.e., false identifications) rather than incorrect assertions of innocence. There are normative values in society that reinforce this concern (as exemplified, for example, by Blackstone's formulation: "Better that 10 guilty persons escape than that one innocent suffer.")

witness will correctly identify the culprit is proportional to the likelihood that the witness will correctly identify lineup candidates as innocent—and thus conclude that evaluation of PPV alone is sufficient. Contrary to that intuition, however, evidence from studies of analogous binary classification problems reveals that these two predictive probabilities can vary with respect to one another in complex ways.[58]

In practice, NPV-related measures (quantified as negative likelihood ratios) can be subjected to ROC analysis to account for the effects of response bias in the same manner as PPV-related measures (quantified as positive likelihood ratios, i.e., diagnosticity ratios)—the ROC axes in the NPV case corresponding to 1-HR and 1-FAR. Consideration of NPV and its relationship to PPV, by this and other means, may provide additional insight into the ways in which estimator and system variables (such as lineup procedures) influence eyewitness identification performance.[59]

In sum, a formal understanding of the task facing an eyewitness, in conjunction with an appreciation of causal models of human recognition memory, has led to a potentially more comprehensive method—ROC analysis—for evaluating eyewitness identification performance. Despite these advances, it is important that practitioners in this field broadly explore the large and rich field of statistical tools for evaluation of binary classifiers. While the committee recognizes that these tools are uninvestigated for this application and may possess their own share of unforeseen problems or disadvantages, a move in this direction may be of great value for improving the validity of eyewitness identification.

Interactions with Eyewitnesses (Feedback)

The nature of law enforcement interactions with the eyewitness before, during, and after the identification plays a role in the accuracy of eyewitness identifications and in the confidence expressed in the accuracy of those identifications by witnesses.[60] Law enforcement's maintenance of neutral pre-identification communications—relative to the identification of a suspect—is seen as vital to ensuring that the eyewitness is not subjected to conscious or unconscious verbal or behavioral cues that could influence the

[58]S-Y Shiu and C. Gatsonis, "The Predictive Receiver Operating Characteristic Curve for the Joint Assessment of the Positive and Negative Predictive Values," *Philosophical Transactions, Series A, Mathematical, Physical and Engineering Sciences* 366 (1874): 2313–2333 (2008).

[59]Another potentially informative analysis that combines PPV and NPV measures is known as a PROC (predictive ROC), which affords the opportunity to see how a given system or estimator variable may have interacting—synergistic or antagonistic—effects on assertions of guilt and innocence. See Shiu and Gatsonis, "The Predictive Receiver Operating Characteristic Curve."

[60]S. E. Clark, T. E. Marshall, and R. Rosenthal, "Lineup Administrator Influences on Eyewitness Identification Decisions," *Journal of Experimental Psychology: Applied* 15(1): 63 (2009).

eyewitness' identification (see Box 2-1).[61] If a witness happened to overhear an officer say, "We've got him, but before we finalize the arrest, let's have the witness confirm it," the witness might be biased to confirm the suspect's identity in a showup. Furthermore, some types of law enforcement communication with a witness, after the witness has made an identification (e.g., "Good work! You picked the right guy..."), can increase confidence in an identification, regardless of whether the identification is correct.[62]

As discussed in Chapter 2, use of "blinded" or "double-blind" lineup identification procedures is an effective strategy for reducing the likelihood that a witness will be exposed to cues from interactions with law enforcement (such as feedback) that could influence identifications and/or confidence in those identifications. More generally, efforts to maintain objectivity and eliminate potentially informative communication will help ensure that eyewitness reports are not contaminated by knowledge or opinions held by others.

RESEARCH STUDIES ON ESTIMATOR VARIABLES

The impact of estimator variables on eyewitness accuracy is harder to measure in the field than the impact of system variables.[63] Consequently, estimator variables have been studied nearly exclusively in laboratory settings. The committee's review revealed the need for further empirical research in individual studies and systematic reviews of research on these factors.

The committee's review focused on the most-studied estimator variables: weapon focus, stress and fear, own-race bias, exposure, and retention interval. It is important to emphasize, however, that numerous other estimator variables may affect both the reliability and the accuracy of eyewitness identifications. Research has shown that the physical distance between the witness and the perpetrator is an important estimator variable, as it directly affects the ability of the eyewitness to discern visual details,[64] including features of the perpetrator[65] (see discussion of vision in Chapter 4). Re-

[61] Clark, Moreland, and Gronlund, "Evolution of the Empirical and Theoretical Foundations of Eyewitness Identification Reform": "...the performance advantage for unbiased instructions has decreased only slightly over the past 32 years. However, none of the correlations approached statistical significance." p. 258.

[62] Douglas and Steblay, "Memory Distortion in Eyewitnesses."

[63] G. L. Wells, "What Do We Know about Eyewitness Identification?" *American Psychologist* (May 1993): 553, 555.

[64] B. Uttl, P. Graf, and A. L. Siegenthaler, "Influence of Object Size on Baseline Identification, Priming, and Explicit Memory: Cognition and Neurosciences," *Scandinavian Journal of Psychology* 48(4): 281–288 (2007).

[65] C. L. Maclean et al., "Post-Identification Feedback Effects: Investigators and Evaluators," *Applied Cognitive Psychology* 25(5): 739–752 (2011).

search has also shown that an appearance change can greatly diminish the eyewitness' ability to recognize the perpetrator; the eyewitness' ability to remember faces of his or her own age group is often superior to his or her ability to remember faces of another age group (own-age bias); and if an eyewitness hears information or misinformation from another person before law enforcement involvement, his or her recollection of the event and confidence in the identification can be altered (co-witness contamination).[66] Interactions between and among these variables have not been addressed systematically by researchers.

Weapon Focus

The presence of an unusual object at the scene of a crime can impair visual perception and memory of key features of the crime event. Research suggests that the presence of a weapon at the scene of a crime captures the visual attention of the witness and impedes the ability of the witness to attend to other important features of the visual scene, such as the face of the perpetrator (see also discussion of visual attention in Chapter 4). The ensuing lack of memory of these other key features may impair recognition of a perpetrator in a subsequent lineup.

A 1992 analysis of weapon focus studies found that the presence of a weapon reduced both identification accuracy and feature accuracy (e.g., the eyewitness' ability to recall clothing, facial features, and more).[67] A more recent analysis of the weapon focus literature concluded that the presence of a weapon has an inconsistent effect on identification accuracy, in that larger effect sizes were observed in threatening scenarios than in non-threatening ones.[68] As the retention interval increased, the weapon focus effect size decreased. The analysis further indicated that the effect of a weapon on accuracy is slight in actual crimes, slightly larger in laboratory studies, and largest for simulations.

One possible cause of the inconsistent effects of the presence of a weapon is suggested by a recent laboratory-based study that exposed participants to crime videos.[69] These investigators used ROC analysis to investigate discriminability as a function of (1) sequential versus simultaneous lineups; (2) the presence of a weapon; and (3) the presence of a distinctive facial feature. Importantly for the present discussion, discriminability was

[66]R. Zajac and N. Henderson, "Don't It Make My Brown Eyes Blue: Co-Witness Misinformation about a Target's Appearance Can Impair Target-Absent Lineup Performance," *Memory* 17(3): 266–278 (2009).

[67]N. K. Steblay, "A Meta-analytic Review of the Weapon Focus Effect," *Law and Human Behavior* 16(4): 413, 415–417 (1992).

[68]Fawcett et al., "Of Guns and Geese."

[69]Carlson and Carlson, "An Evaluation of Lineup Presentation."

reduced when the perpetrator possessed a weapon, but only when no distinctive facial feature was present. This interaction between weapon focus and distinctive feature highlights the importance of exploring the effects of interactions between different estimator variables on eyewitness identification performance.

Additional questions remain as to what is the cause of reduced eyewitness performance in cases where a weapon is present. Is the effect caused by a diversion of selective attention, as is suggested by basic research on the phenomenon of inattentional blindness (see Chapter 4)? Is stress a significant factor, i.e., does anxiety cause the witness to focus less on the features of a person's face? To what extent is the prominence of the issue an artifact of the particular studies included in the meta-analysis? Is it possible, for example, that the magnitude of the weapon effect depends on whether the data are collected in a laboratory setting versus the real world? To this latter point, some analyses of weapon focus have been conducted using archival records of crimes involving weapons.[70] Unfortunately, such efforts often encounter serious methodological difficulties that include a lack of information about the crime (e.g., exposure duration) and the general lack of "ground truth" regarding accuracy of any identification, among other problems.

Stress and Fear

High levels of stress or fear can affect eyewitness identification.[71,72,73] This finding is not surprising, given the known effects of fear and stress on vision and memory (see Chapter 4). Under conditions of high stress, a witness' ability to identify key characteristics of an individual's face (e.g., hair length, hair color, eye color, shape of face, presence of facial hair) may be significantly impaired.[74]

In the particular case of weapon focus, it may not be possible to sufficiently test the effects of stress and heightened stress in the laboratory because of limitations on human participant research that uses realistic and heightened threats. A meta-analysis of the effect of high stress on eyewitness

[70]See, e.g., Fawcett et al., "Of Guns and Geese."

[71] Deffenbacher et al., "A Meta-Analytic Review of the Effects of High Stress."

[72]C. A. Morgan III et al., "Accuracy of Eyewitness Memory for Persons Encountered During Exposure to Highly Intense Stress," *International Journal of Law and Psychiatry* 27(3): 265–279 (2004).

[73]C. A. Morgan III et al., "Accuracy of Eyewitness Identification Is Significantly Associated with Performance on a Standardized Test of Recognition," *International Journal of Law and Psychiatry* 30 (3): 213–223 (2007).

[74]C. A. Morgan III et al., "Misinformation Can Influence Memory for Recently Experienced, Highly Stressful Events," *International Journal of Law and Psychiatry* 36(1): 11–17 (2013).

memory nonetheless found some support for the notion that stress impairs both eyewitness recall and identification accuracy.[75] The study authors noted that lineup type "moderated the effect of heightened stress on the false alarm rate."[76] They also suggested that the modest effect of stress may be caused by the fact that the analysis included many studies that involved modest stress-induction.[77]

Earlier studies were more mixed but with clearer results at "high levels of cognitive anxiety."[78] The findings of an earlier study "provide a concrete illustration of catastrophic decline" of eyewitness identification performance at high anxiety levels.[79] The correct identification rate went from 75 percent for those with low-state anxiety to 18 percent rate for those with high-state anxiety.[80]

The effects of suggestion may be particularly important when the original memory is of a highly stressful event. A recent study looked at more than 850 active-duty military personnel participating in a mock POW camp phase of U.S. military survival school training, which included aggressive interrogation and physical isolation-related stress.[81] The study found that misinformative details of the interrogation event (e.g., regarding the identity of the interrogator), which were introduced after the event had been encoded into long-term memory, affected identification accuracy. The study also found that memories acquired during stressful events are highly vulnerable to modification by exposure to post-event misinformation, even in individuals whose level of training and experience might be considered relatively immune to such influences.

Another recent study comparing the eyewitness accuracy of officers and citizens, concentrated on the effects of stress and weapon focus.[82] The results of this study showed that officers were less stressed and aroused than

[75]Deffenbacher et al., "A Meta-Analytic Review of the Effects Of High Stress." It should be noted that the effect sizes for stress-induced support were small with wide confidence intervals, indicating considerable heterogeneity across studies. Although the authors assert that 300 studies with null findings would be required to negate the small effects found in this meta-analysis, fewer studies might be needed if they resulted in opposite effects.

[76]Ibid, 700.

[77]Ibid, 704.

[78]Ibid, 689.

[79]T. Valentine and J. Mesout, "Eyewitness Identification Under Stress in the London Dungeon," *Applied Cognitive Psychology* 23(2): 151–161 (2009).

[80]K. A. Deffenbacher, "Estimating the Impact of Estimator Variables on Eyewitness Identification: A Fruitful Marriage of Practical Problem Solving and Psychological Theorizing," *Applied Cognitive Psychology* 22(6): 822 (2008).

[81]Morgan et al., "Misinformation Can Influence Memory."

[82]J. C. DeCarlo, "A Study Comparing the Eyewitness Accuracy of Police Officers and Citizens," (PhD Diss, City University of New York, 2010).

citizens, but that both police and citizens made more errors when a weapon was inferred or present.

Own-Race Bias

The race and ethnicity of a witness as it relates to that of the perpetrator is another important estimator variable. In eyewitness identification, own-race bias describes the phenomenon in which faces of people of races different from that of the eyewitness are harder to discriminate (and thus harder to identify accurately) than are faces of people of the same race as the eyewitness.[83] In the laboratory, this effect is manifested by higher hit rates and lower false alarm rates (higher diagnosticity ratio) in the recognition of an observer's own race relative to hits and false-alarms for recognition of other races.[84] Own-race bias occurs in both visual discrimination and memory tasks, in laboratory and field studies, and across a range of races, ethnicities, and ages. Recent analyses revealed that cross-racial (mis) identification was present in 42 percent of the cases in which an erroneous eyewitness identification was made.[85]

A recent meta-analysis of own-race bias found an interaction between own-race bias and the duration of viewing exposure: reducing the amount of time allowed for viewing of each face significantly increased the magnitude of the bias, largely manifested as an increase in the proportion of false alarm responses to other-race faces.[86] Own-race bias also interacts with the memory retention interval; cross-race errors of identification were greater when there were longer periods of time between the initial exposure and the memory retrieval.[87] A recent study found that "context reinstatement," wherein a researcher asks an individual to mentally re-create the context in which an incident occurred, failed to influence the identification of other-race faces.[88]

Although the existence of own-race bias is generally accepted, the causes for this effect are not fully understood. Some possible explanations are rooted in in-group/out-group models of human behavior (e.g., favorit-

[83]R. S. Malpass and J. Kravitz, "Recognition for Faces of Own and Other Race," *Journal of Personality and Social Psychology* 13(4): 330–334 (1969).

[84]Meissner and Brigham, "Thirty Years of Investigating the Own-Race Bias."

[85]The Innocence Project, "What Wrongful Convictions Teach Us About Racial Inequality," available at: http://www.innocenceproject.org/Content/What_Wrongful_Convictions_Teach_Us_About_Racial_Inequality.php.

[86]Meissner and Brigham, "Thirty Years of Investigating the Own-Race Bias."

[87]Ibid.

[88]J. R. Evans, J. L. Marcon, and C.A. Meissner, "Cross-Racial Lineup Identification: Assessing the Potential Benefits of Context Reinstatement," *Psychology, Crime, and Law* 15 (1): 19–28 (2009).

ism in which decisions regarding members of one's own "group" are regarded as having greater importance than decisions regarding members of a different "group") and differential perceptual expertise that results from different degrees of exposure to and familiarity with same versus other races.

Recent work has examined the role that stereotyping might play.[89] One study suggests that, in general, cross-race identification is further impaired when faces are presented in a group (as opposed to one at a time).[90] Additional research is needed to identify procedures that may help estimate the degree of own-race biases in individual eyewitnesses following an identification procedure. Until the scientific basis for these effects is better understood, great care may be warranted when constructing lineups in instances where the race of the suspect differs from that of the eyewitness.

Exposure Duration

Eyewitness identification researchers have long believed that exposure duration (e.g., time spent observing a perpetrator's face during a crime) is correlated with greater accuracy of eyewitness identification. The courts also have assumed that exposure duration has an effect on identification accuracy.[91] Meta-analyses on the effects of exposure time have found that relatively long exposure durations produce greater accuracy[92] and a larger and more stable effect size for exposure duration on eyewitness identi-

[89]H. M. Kleider, S. E. Cavrak, and L. R. Knuycky, "Looking Like a Criminal: Stereotypical Black Facial Features Promote Face Source Memory Error," *Memory and Cognition* 40(8): 1200–1213 (2012).

[90]K. Pezdek, M. O'Brien, and C. Wasson, "Cross-Race (but Not Same-Race) Face Identification Is Impaired by Presenting Faces in a Group Rather Than Individually," *Law and Human Behavior* 36(6): 488–495 (2012).

[91]*Manson v. Brathwaite*, 432 U.S. 98, 114 (1977), for example, included as a factor for assessing the reliability and admissibility of an identification, "the opportunity of the witness to view the criminal at the time of the crime" and explained that this factor includes both the length of time and the viewing conditions.

[92]B. H. Bornstein et al., "Effects of Exposure Time and Cognitive Operations on Facial Identification Accuracy: A Meta-Analysis of Two variables Associated with Initial Memory Strength," *Psychology, Crime, and Law* 18 (5): 473–490 (2012). The authors state, "We used z as the primary effect size measure for differences between proportions correct, but we also converted z to Pearson's r for comparability to other meta-analyses (see Tables 1 and 2). The rs were then normalized and averaged to obtain the overall mean effect sizes. We also report the value of Cohen's d associated with each mean effect size" (Bornstein et al., "Effects of Exposure Time and Cognitive Operations)." Although not defined, presumably z refers to the usual difference in means divided by its standard error, and, from their tables, their r was calculated as z divided by the square root of the report sample size.

fication accuracy.[93] Longer exposures were associated with higher rates of correct identifications and lower false alarm rates. Exposure duration may affect, or interact with, other variables, including own-race bias and the confidence–accuracy relationship assessed immediately after the lineup decision.[94]

The findings and conclusions from eyewitness identification studies of exposure duration are in keeping with much of the basic research on visual system function (reviewed in Chapter 4). This basic research indicates that the additional information available from longer viewing times reduces uncertainty and enables better detection and discrimination of visual stimuli.

Retention Interval

Retention interval, or the amount of time that passes from the initial observation and encoding of a memory to a future time when the initial observation must be recalled from memory, can affect identification accuracy. Laboratory studies have demonstrated that stored memories are more likely to be forgotten with the increasing passage of time and can easily become "enhanced" or distorted by events that take place during this retention interval (see discussion of memory in Chapter 4). The amount of time between viewing a crime and the subsequent identification procedure can be expected to similarly affect the accuracy of the eyewitness identification, either independently or in combination with other variables.[95]

It is difficult to specify the precise relationship between retention interval and the accuracy of eyewitness identification testimony and to estimate when a lengthy retention interval will significantly impair the accuracy of identification. Although, in general, it appears that longer retention intervals are associated with poorer eyewitness identification performance, the strength of this association appears to vary greatly across the circumstances of the initial encounter, identification procedures, and research method-

[93]B. H. Bornstein, K. A. Deffenbacher, E. K. McGorty, and S. D. Penrod, "The Effect of Cognitive Processing on Facial Identification Accuracy: A Meta-Analysis" (Unpublished manuscript, University of Nebraska-Lincoln, 2007).

[94]M. A. Palmer, et al., "The Confidence–Accuracy Relationship for Eyewitness Identification Decisions: Effects of Exposure Duration, Retention Interval, and Divided Attention," *Journal of Experimental Psychology: Applied* 19(1): 55–71 (2013).

[95]One month is the most commonly encountered delay by British police. G. Pike, N. Brace, and S. Kynan, *The Visual Identification of Suspects: Procedures and Practice* (London: Policing and Reducing Crime Unit, 2002), cited by Deffenbacher et al., "Forgetting the Once-Seen Face." Law enforcement authorities may have little control over the time required to identify a suspect and obtain the cooperation of the eyewitness to participate in an identification procedure. Thus, retention interval has commonly been considered an estimator variable in eyewitness identification studies.

ologies.[96] A meta-analysis of published facial recognition and eyewitness identification studies found, for example, that an increase in the retention interval was associated with a decreased probability of an accurate identification of a previously seen but otherwise unfamiliar face.[97] This same study also found that the rate of forgetting for an unfamiliar face is greatest soon after the initial observation and tends to level off over time, but was unable to specify the shape of this function.

The effect of the retention interval also is influenced by the strength and quality of the initial memory that is encoded, which, in turn, may be influenced by other estimator variables associated with witnessing the crime (such as the degree of visual attention) and viewing factors (such as distance, lighting, and exposure duration). As the retention interval becomes longer, the opportunity for intervening events to alter the memory also becomes greater, and other variables may interact with the retention interval to impair performance (see also discussion of memory in Chapter 4). During the retention interval, the ability to accurately identify faces of other races drops off especially quickly, relative to same-race accuracy.[98] Also, for those eyewitnesses who initially express less confidence in their identification, there is a greater decrease in accuracy of identification when the retention interval is longer.[99]

CONCLUSION

Research on eyewitness identification has appropriately identified the variables that may affect an individual's ability to make an accurate identification. Early research findings played an important role in alerting law enforcement, prosecutors, defense counsel, and the judiciary to factors that

[96]See J. Dysart and R. C. L. Lindsay, "The Effects of Delay on Eyewitness Identification Accuracy: Should We Be Concerned?" in *The Handbook of Eyewitness Psychology: Volume II: Memory for People*, ed. R. C. L. Lindsay, D. F. Ross, J. D. Read, and M. P. Toglia. (Mahwah: Lawrence Erlbaum and Associates, 2006), 361–373.

[97]Deffenbacher et al., "Forgetting the Once-Seen Face." More than 20 of the published studies included in the meta-analysis found no significant effect of retention interval.

[98]J. L. Marcon et al., "Perceptual Identification and the Cross-Race Effect," *Visual Cognition* 18(5): 767–779 (2010) (finding that the cross-race effect was more pronounced when the retention interval was lengthened). Meissner and Brigham, "Thirty Years of Investigating the Own-race Bias" [meta-analysis finding that as retention time increased "participants increasingly adopted a more liberal response criterion when responding to other-race faces. This liberal response criterion indicated that participants required less evidence from memory (e.g., familiarity or memorability of the face) to respond that they had previously seen an other-race face."].

[99]J. Sauer et al., "The Effect of Retention Interval on the Confidence–Accuracy Relationship for Eyewitness Identification," *Law and Human Behavior* 34: 337–347 (2010) (finding greater overconfidence at lengthy retention intervals).

might influence the accuracy of identifications. In some jurisdictions, eyewitness identification research was used to improve policies and procedures and to educate and train officers. However, much remains unsettled in many areas of eyewitness identification research.

While past research appropriately identified system and estimator variables that may affect an individual's ability to make an accurate identification, this research might be strengthened in several ways. Greater collaboration between the police, courts, and researchers might lead to increased consensus on research agendas and the conceptualization of variables to be examined. More attention to reproducibility and transparency is needed in the selection of data collection strategies and reporting of data. Analyses need to be reported completely, including estimates of effects, confidence intervals, and significance levels. Further, in order to be useful to stakeholders, the statistical findings of this research need to be translated back into terms that can be readily understood by practice and policy decision-makers.

Further, our understanding of errors in eyewitness identification will benefit from more effective research designs, more informative statistical measures and analyses, more probing analyses of research findings, and more sophisticated systematic reviews and meta-analyses. In view of the complexity of the effects of both system and estimator variables, and their interactions, on eyewitness identification accuracy, better experimental designs that incorporate selected combinations of these variables (e.g., presence or absence of a weapon, lighting conditions, etc.) will elucidate those variables with meaningful influence on eyewitness performance, which can inform law enforcement practice of eyewitness identification procedures. To date, the eyewitness literature has evaluated procedures mostly in terms of a single diagnosticity ratio or an ROC curve; even if uncertainty is incorporated into the analysis, many other powerful tools for evaluating a "binary classifier" are worthy of consideration.[100]

When primary studies such as those described above are available in sufficient quantities, it is important that their results are synthesized using systematic reviews that conform to current best standards.[101] These quantitative reviews would necessarily employ transparent, reproducible procedures for locating all relevant published and unpublished research; employ independent, duplicate procedures for selection of studies, extraction of data, and assessment of risk of bias; use meta-analytic procedures

[100]Hastie, Tibshirani, and Friedman, *The Elements of Statistical Learning*.

[101]See, e.g., A. Liberati, et al., "The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration," *PLoS Medicine* 6(7): e1000100. doi:10.1371/journal.pmed.1000100 (2009) and Institute of Medicine, *Finding What Works in Health Care: Standards For Systematic Reviews* (Washington, DC: The National Academies Press, 2011).

that account for the heterogeneity of outcomes both within and across studies; and interpret confidence intervals around pooled effects in a way that is readily understandable by stakeholders. These systematic reviews (which would be regularly updated as new studies are conducted) can be used to further refine the research agenda in eyewitness identification research and to establish priorities for funding of additional primary research.

6

Findings and Recommendations

Eyewitnesses make mistakes. Our understanding of how to improve the accuracy of eyewitness identifications is imperfect and evolving. In the previous chapters, we described law enforcement procedures to elicit accurate eyewitness identifications; the courts' handling of eyewitness identification evidence; the science of visual perception and memory as it applies to eyewitness identifications; and the contributions of scientific research to our understanding of the variables that affect the accuracy of identifications. On the basis of its review, the committee offers its findings and recommendations for

- identifying and facilitating best practices in eyewitness procedures for the law enforcement community;
- strengthening the value of eyewitness identification evidence in court; and
- improving the scientific foundation underpinning eyewitness identification.

OVERARCHING FINDINGS

The committee is confident that the law enforcement community, while operating under considerable pressure and resource constraints, is working to improve the accuracy of eyewitness identifications. These efforts, however, have not been uniform and often fall short as a result of insufficient training, the absence of standard operating procedures, and the continuing

presence of actions and statements at the crime scene and elsewhere that may intentionally or unintentionally influence eyewitness' identifications.

Basic scientific research on human visual perception and memory has provided an increasingly sophisticated understanding of how these systems work and how they place principled limits on the accuracy of eyewitness identification (see Chapter 4).[1] Basic research alone is insufficient for understanding conditions in the field and thus has been augmented by studies applied to such specific practical problem of eyewitness identification (see Chapter 5). Such applied research has identified key variables that affect the accuracy and reliability of eyewitness identifications and has been instrumental in informing law enforcement, the bar, and the judiciary of the frailties of eyewitness identification testimony.

A range of best practices has been validated by scientific methods and research and represents a starting place for efforts to improve eyewitness identification procedures. A number of law enforcement agencies have, in fact, adopted research-based best practices. This report makes actionable recommendations on, for example, the importance of adopting "blinded" eyewitness identification procedures. It further recommends that standardized and easily understood instructions be provided to eyewitnesses and calls for the careful documentation of eyewitness' confidence statements. Such improvements may be broadly implemented by law enforcement now. It is important to recognize, however, that, in certain cases, the state of scientific research on eyewitness identification is unsettled. For example, the relative superiority of competing identification procedures (i.e., simultaneous versus sequential lineups) is unresolved.

The field would benefit from collaborative research among scientists and law enforcement personnel in the identification and validation of new best practices that can improve eyewitness identification procedures. Such a foundation can be solidified through the use of more effective research designs (for example, those that consider more than one variable at a time, and in different study populations to ensure reproducibility and generalizability), more informative statistical measures and analyses (i.e., methods from statistical machine learning and signal detection theory to evaluate the performance of binary classification tasks), more probing analyses of research findings (such as analyses of consequences of data uncertainties), and more sophisticated systematic reviews and meta-analyses (that take

[1]Basic research on vision and memory seeks a comprehensive understanding of how these systems are organized and how they operate generally. The understanding derived from basic research includes principles that enable one to predict how a system (such as vision or memory) might behave under specific conditions (such as those associated with witnessing a crime), and to identify the conditions under which it will operate most effectively and those under which it will fail. Applied research, by contrast, empirically evaluates specific hypotheses about how a system will behave under a particular set of real-world conditions.

account of current guidelines, including transparency and reproducibility of methods).

In view of the complexity of the effects of both system and estimator variables and their interactions on eyewitness identification accuracy, better experimental designs that incorporate selected combinations of these variables (e.g., presence or absence of a weapon, lighting conditions, etc.) will elucidate those variables with meaningful influence on eyewitness performance, which can, in turn, inform law enforcement practice of eyewitness identification procedures. To date, the eyewitness literature has evaluated procedures mostly in terms of a single diagnosticity ratio or an ROC (Receiver Operating Characteristic) curve; even if uncertainty is incorporated into the analysis, many other powerful tools for evaluating a "binary classifier" are available and worthy of consideration.[2] Finally, syntheses of eyewitness research has been limited to meta-analyses that have not been conducted in the context of systematic reviews. Systematic reviews of stronger research studies need to conform to current standards and be translated into terms that are useful for decision-makers.

The committee offers the following recommendations to strengthen the effectiveness of policies and procedures used to obtain accurate eyewitness identifications.

RECOMMENDATIONS TO ESTABLISH BEST PRACTICES FOR THE LAW ENFORCEMENT COMMUNITY

The committee's review of law enforcement practices and procedures, coupled with its consideration of the scientific literature, has identified a number of areas where eyewitness identification procedures could be strengthened. The practices and procedures considered here involve acquisition of data that reflect a witness' identification and the contextual factors that bear on that identification. A recurrent theme underlying the committee's recommendations is development of, and adherence to, guidelines that are consistent with scientific standards for data collection and reporting.

Recommendation #1: Train All Law Enforcement Officers in Eyewitness Identification

The resolution and accuracy of visual perceptual experience, as well as the fidelity of our memories to events perceived, may be compromised by many factors at all stages of processing (see Chapter 4). Perceptual experiences are limited by uncertainties and biased by expectations. Unknown

[2]T. Hastie, R. Tibshirani, and J. H. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction* (New York: Springer, 2009).

to the individual, memories are forgotten, reconstructed, updated, and distorted. An eyewitness's memory can be contaminated by a wide variety of influences, including interaction with the police.

The committee recommends that all law enforcement agencies provide their officers and agents with training on vision and memory and the variables that affect them, on practices for minimizing contamination, and on effective eyewitness identification protocols. In addition to instruction at the police academy, officers should receive periodic refresher training, and officers assigned to investigative units should receive in-depth instruction. Dispatchers should be trained not to "leak" information from one caller to the next and to ask for information in a non-leading way. Police officers should be trained to ask open-ended questions, avoid suggestiveness, and efficiently manage scenes with multiple witnesses (e.g., minimize interactions among witnesses).

Recommendation #2: Implement Double-Blind Lineup and Photo Array Procedures

Decades of scientific evidence demonstrate that expectations can bias perception and judgment and that expectations can be inadvertently communicated.[3] Even when lineup administrators scrupulously avoid comments that could identify which person is the suspect, unintended body gestures, facial expressions, or other nonverbal cues have the potential to inform the witness of his or her location in the lineup or photo array.

Double-blinding is central to the scientific method because it minimizes the risk that experimenters might inadvertently bias the outcome of their research, finding only what they expected to find. For example, in medical clinical trials, double-blind designs are crucial to account for experimenter biases, interpersonal influences, and placebo effects.

To minimize inadvertent bias, double-blinding procedures are sometimes used in which the test administrator does not know the composition of the photo array or lineup. If administrators are not involved with construction of the lineup and are unaware of the placement of the potential suspect in the sequence, then they cannot influence the witness.

Some in the law enforcement community have responded to calls for double-blind lineup administration with concern, citing the potential for increased financial costs and human resource demands. The committee believes there are ways to reduce these costs and recommends that police departments consider procedures and new technologies that increase efficiency of data acquisition under double-blind procedures or those procedures that closely approximate double-blind procedures. If an administrator who does

[3]See Box 2-1.

not know the identity of the suspect cannot be assigned to the task, then a non-blind administrator (one knowing the status of the individuals in the lineup) might use a computer-automated presentation of lineup photos. If computer-based presentation technology is unavailable, then the administrator could place photos in numbered folders that are then shuffled, as is current practice in some jurisdictions.

The committee recommends blind (double-blind or blinded) administration of both photo arrays and live lineups and the adoption of clear, written policies and training on photo array and live lineup administration. Police should use blind procedures to avoid the unintentional or intentional exchange of information that might bias an eyewitness. The "blinded" procedure minimizes the possibility of either intentional or inadvertent suggestiveness and thus enhances the fairness of the criminal justice system. Suggestiveness during an identification procedure can result in suppression of both out-of-court and in-court identifications and thereby seriously impair the prosecutions's ability to prove its case beyond a reasonable doubt. The use of double-blind procedures will eliminate a line of cross-examination of officers in court.

Recommendation #3: Develop and Use Standardized Witness Instructions

The committee recommends the development of a standard set of easily understood instructions to use when engaging a witness in an identification procedure.

Witnesses should be instructed that the perpetrator may or may not be in the photo array or lineup and that the criminal investigation will continue regardless of whether the witness selects a suspect. Administrators should use witness instructions consistently in all photo arrays or lineups, and can use pre-recorded instructions or read instructions aloud, in the manner of the mandatory reading of Miranda Rights. Accommodations should be made when questioning non-English speakers or those with restricted linguistic ability. Additionally, the committee recommends the development and use of a standard set of instructions for use with a witness in a showup.

Recommendation #4: Document Witness Confidence Judgments

Evidence indicates that self-reported confidence at the time of trial is not a reliable predictor of eyewitness accuracy.[4] The relationship between the witness' stated confidence and accuracy of identifications may be greater at the moment of initial identification than at the time of trial. However, the strength of the confidence-accuracy relationship varies, as it depends on complex interactions among such factors as environmental conditions, persons involved, individual emotional states, and more.[5] Expressions of confidence in the courtroom often deviate substantially from a witness' initial confidence judgment, and confidence levels reported long after the initial identification can be inflated by factors other than the memory of the suspect. Thus, the committee recommends that law enforcement document the witness' level of confidence verbatim at the time when she or he first identifies a suspect, as confidence levels expressed at later times are subject to recall bias, enhancements stemming from opinions voiced by law enforcement, counsel and the press, and to a host of other factors that render confidence statements less reliable. During the period between the commission of a crime and the formal identification procedure, officers should avoid communications that might affect a witness' confidence level. In addition, to avoid increasing a witness' confidence, the administrator of an identification procedure should not provide feedback to a witness. Following a formal identification, the administrator should obtain level of confidence by witness' self-report (this report should be given in the witness' own words) and document this confidence statement verbatim. Accommodations should be made for non-English speakers or those with restricted linguistic ability.

Recommendation #5: Videotape the Witness Identification Process

The committee recommends that the video recording of eyewitness identification procedures become standard practice.

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[4]See, e.g., C. M. Allwood, J. Knutsson, and P. A. Granhag, "Eyewitnesses Under Influence: How Feedback Affects the Realism in Confidence Judgements," *Psychology, Crime, and Law* 12(1): 25–38 (2006); B. H. Bornstein and D. J. Zickafoose, "'I Know I Know It, I Know I Saw It': The Stability of the Confidence-Accuracy Relationship Across Domain," *Journal of Experimental Psychology-Applied* 5(1): 76–88 (1999); P. A. Granhag, L. A. Stromwall, and C. M. Allwood, "Effects of Reiteration, Hindsight Bias, and Memory on Realism in Eyewitness Confidence," *Applied Cognitive Psychology* 14(5): 397–420 (2000); and H. L. Roediger III, J. T. Wixted, and K. A. DeSoto, "The Curious Complexity between Confidence and Accuracy in Reports from Memory" in *Memory and Law*, ed. L. Nadel and W. P. Sinnott-Armstrong (Oxford: Oxford University Press, 2012).

[5]See, e.g., J. M. Talarico and D. C. Rubin, "Confidence, Not Consistency, Characterizes Flashbulb Memories," *Psychological Science* 14(5): 455–461 (September 2003).

Although videotaping does have drawbacks (e.g., costs, witness advocates opposing videotaping of witnesses' faces, and witnesses not wanting to be videotaped), it is necessary to obtain and preserve a permanent record of the conditions associated with the initial identification. When necessary, efforts should be made to obtain non-intrusive recordings of the initial identification process and to accommodate non-English speakers or those with restricted linguistic ability. Measures should also be taken to protect the identity of eyewitnesses who may be at risk of harm because they make an identification.

RECOMMENDATIONS TO STRENGTHEN THE VALUE OF EYEWITNESS IDENTIFICATION EVIDENCE IN COURT

The best guidance for legal regulation of eyewitness identification evidence comes not from constitutional rulings, but from the careful use and understanding of scientific evidence to guide fact-finders and decision-makers. The *Manson v. Brathwaite* test under the Due Process Clause of the U.S. Constitution for assessing eyewitness identification evidence was established in 1977, before much applied research on eyewitness identification had been conducted. That test evaluates the "reliability" of eyewitness identifications using factors derived from prior rulings and not from empirically validated sources. As critics have pointed out, the *Manson v. Brathwaite* test includes factors that are not diagnostic of reliability. Moreover, the test treats factors such as the confidence of a witness as independent markers of reliability when, in fact, it is now well established that confidence judgments may vary over time and can be powerfully swayed by many factors. While some states have made minor changes to the due process framework, (e.g., by altering the list of acceptable "reliability" factors; see Chapter 3), wholesale reconsideration of this framework is only a recent development (e.g., the recent decisions by state supreme courts in New Jersey and Oregon; see Chapter 3).

Recommendation #6: Conduct Pretrial Judicial Inquiry

Eyewitness testimony is a type of evidence where (as with forms of forensic trace evidence) contamination may occur pre-trial. Judges rarely make pre-trial inquiries about evidence in criminal cases without one of the parties first raising an objection. In cases involving eyewitness evidence, however, parties may not be sufficiently knowledgeable about the relevant scientific research to raise concerns.

Judges have an affirmative obligation to insure the reliability of evidence presented at trial. To meet this obligation, the committee recommends that, as appropriate, a judge make basic inquiries when eyewitness

identification evidence is offered. While the contours of such an inquiry would need to be established on a case-by-case basis, at a minimum, the judge could inquire about prior lineups, what information had been given to the eyewitness before the lineup, what instructions had been given to the eyewitness in connection with administering the lineup, and whether the lineup had been administered "blindly." The judge could also entertain requests from the parties for additional discovery and could ask the parties to brief any issues raised by these inquiries. A judge also could review reports of the eyewitness' confidence and any recordings of the identification procedures. When assessing the reliability of an identification, a judge could also inquire as to what eyewitness identification procedures the agency had in place and the degree to which they were followed. Both pre-trial judicial inquiries and any subsequent judicial review would create an incentive for agencies to adopt written eyewitness identification procedures and to document the identifications themselves.

If these initial inquiries raise issues with the identification process, a judge could conduct a pre-trial hearing to review the reliability and admissibility of eyewitness identification evidence and to assess how it should be treated at trial if found admissible. If indicia of unreliable eyewitness identifications are present, the judge should apply applicable law in deciding whether to exclude the identifications or whether some lesser sanction is appropriate. As discussed in the sections that follow, a judge may limit portions of the testimony of the eyewitness. A judge can also ensure that the jury is provided with a scientific framework within which to evaluate the evidence.

Recommendation #7: Make Juries Aware of Prior Identifications

The accepted practice of in-court eyewitness identifications can influence juries in ways that cross-examination, expert testimony, or jury instructions are unable to counter effectively. Moreover, as research suggests (see Chapters 4 and 5), the passage of time since the initial identification may mean that a courtroom identification is a less accurate reflection of an eyewitness' memory. In-court confidence statements may also be less reliable than confidence judgments made at the time of an initial out-of-court identification; as memory fails and/or confidence grows disproportionately. The confidence of an eyewitness may increase by the time of the trial as a result of learning more information about the case, participating in trial preparation, and experiencing the pressures of being placed on the stand.

An identification of the kind dealt with in this report typically should not occur for the first time in the courtroom. If no identification procedure was conducted during the investigation, a judge should consider ordering that an identification procedure be conducted before trial. In any case,

whenever the eyewitness identifies a suspect in the courtroom, it is important for jurors to hear detailed information about any earlier identification, including the procedures used and the confidence expressed by the witness at that time. The descriptions of prior identifications and confidence at the time of those earlier out-of-court identifications provide more useful information to the fact-finders and decision-makers. Accordingly, the committee recommends that judges take all necessary steps to make juries aware of prior identifications, the manner and time frame in which they were conducted, and the confidence level expressed by the eyewitness at the time.

Recommendation #8: Use Scientific Framework Expert Testimony

The committee finds that a scientific framework describing what factors may influence a witness' visual experience of an event and the resolution and fidelity of that experience, as well as factors that underlie and influence subsequent encoding, storage, and recall of memories of an event, can inform the fact-finder in a criminal case. As discussed throughout this report, many scientifically established aspects of eyewitness memory are counterintuitive and may defy expectations. Jurors will likely need assistance in understanding the factors that may affect the accuracy of an identification. In many cases this information can be most effectively conveyed by expert testimony.

Contrary to the suggestion of some courts, the committee recommends that judges have the discretion to allow expert testimony on relevant precepts of eyewitness memory and identifications. Expert witnesses can explain scientific research in detail, capture the nuances of the research, and focus their testimony on the most relevant research. Expert witnesses can convey current information based on the state of the research at the time of a trial. Expert witnesses can also be cross-examined, and limitations of the research can be expressed to the jury.

Certainly, qualified experts will not be easy to locate in a given jurisdiction; and indigent defendants may not be able to afford experts absent court funds. Moreover, once the defense secures an expert, the prosecution may retain a rebuttal expert, adding complexity to the litigation. Further investigation may explore the effectiveness of expert witness presentation of relevant scientific findings compared with jury instructions. Until there is a clearer understanding of the strengths and weaknesses of this technique, the committee views expert testimony as an appropriate and effective means of providing the jury with information to assess the strength of the eyewitness identification.

Expert witnesses should not be permitted to testify without limits. An expert explaining the relevant scientific framework can describe the state of the research and focus on the factors that are particularly relevant in a

given case. However, an expert must not be allowed to testify beyond the limits of his or her expertise. Although current scientific knowledge would allow an expert to inform the jury of factors bearing on their evaluation of an eyewitness' identification, the committee has seen no evidence that the scientific research has reached the point that would properly permit an expert to opine, directly or through an equivalent hypothetical question, on the accuracy of an identification by an eyewitness in a specific case.

In many jurisdictions, expert witnesses who can testify regarding eyewitness identification evidence may be unavailable. In state courts, funding for expert witnesses may be far more limited than funding in federal courts. The committee recommends that local jurisdictions make efforts to ensure that defendants receive funding to obtain access to qualified experts.

Recommendation #9: Use Jury Instructions as an Alternative Means to Convey Information

The committee recommends the use of clear and concise jury instructions as an alternative means of conveying information regarding the factors that the jury should consider.

Jury instructions should explain, in clear language, the relevant principles. Like the New Jersey instructions,[6] the instructions should allow judges to focus on factors relevant to the specific case, since not all cases implicate the same factors. Jury instructions do not need to be as detailed as the New Jersey model instructions and do not need to omit all reference to underlying research. With the exception of the New Jersey instructions, jury instructions have tended to address only certain subjects, or to repeat the problematic *Manson v. Brathwaite* language, which was not intended as instructions for jurors.

Appropriate legal organizations, together with law enforcement, prosecutors, defense counsel, and judges, should convene a body to establish model jury instructions regarding eyewitness identifications.

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[6]New Jersey Criminal Model Jury Instructions, *Identification* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/jury_instruction.pdf. New Jersey Court Rule 3:11, *Record of an Out-of-Court Identification Procedure* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/new_rule.pdf, New Jersey Court Rule 3:13-3. *Discovery and Inspection* (July 19, 2012), available at: http://www.judiciary.state.nj.us/pressrel/2012/rev_rule.pdf.

RECOMMENDATIONS TO IMPROVE THE SCIENTIFIC FOUNDATION UNDERPINNING EYEWITNESS IDENTIFICATION RESEARCH

Basic scientific research on visual perception and memory provides important insight into the factors that can limit the fidelity of eyewitness identification (see Chapter 4). Research targeting the specific problem of eyewitness identification (see Chapter 5) complements basic scientific research. However, this strong scientific foundation remains insufficient for understanding the strengths and limitations of eyewitness identification procedures in the field. Many of the applied studies on key factors that directly affect eyewitness performance in the laboratory are not readily applicable to actual practice and policy. Applied research falls short because of a lack of reliable or standardized data from the field, a failure to include a range of practitioners in the establishment of research agendas, the use of disparate research methodologies, failure to use transparent and reproducible research procedures, and inadequate reporting of research data. The task of guiding eyewitness identification research toward the goal of evidence-based policy and practice will require collaboration in the setting of research agendas and agreement on methods for acquiring, handling, and sharing data.

Recommendation #10: Establish a National Research Initiative on Eyewitness Identification

To further our understanding of eyewitness identification, the committee recommends the establishment of a National Research Initiative on Eyewitness Identification (hereinafter, the Initiative). The Initiative should involve the academic research community, law enforcement community, the federal government, and philanthropic organizations. The Initiative should (1) establish a research agenda to guide research for the next decade; (2) formulate practice- and policy-relevant research questions; (3) identify opportunities for additional data collection; (4) systematically review research to examine emerging findings on the impact of system and estimator variables; (5) translate research findings into policies and procedures that are both practical and appropriate for law enforcement; and (6) set priorities and timelines for issues to be addressed, the conduct of research, the development of best practices, and formal assessments.

The committee notes that there appear to be few existing partnerships between the scientific community and law enforcement organizations and therefore recommends that the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST) take a leadership role working with other federal agencies, such as the National Institute of

Justice (NIJ), the Bureau of Justice Statistics (BJS), and the Federal Bureau of Investigation (FBI), to support such collaborations.

The impact on society of innocents being incarcerated while perpetrators remain free, in conjunction with limited federal resources, highlights the need for both public and private support for this Initiative.

To enhance the scientific foundation of eyewitness identification research and practice, the Initiative should commit to the following:

a. Include a practice- and data-informed research agenda that incorporates input from law enforcement and the courts and establishes methodological and reporting standards for research to assess the fundamental performance of various aspects of eyewitness identification procedures as well as synthesize research findings across studies.
b. Develop protocols and policies for the collection, preservation, and exchange of field data that can be used jointly by the scientific and law enforcement communities. Data collection procedures used in the field should be developed to ensure the relevance of the collected data, to facilitate analysis of the data, and to minimize potential bias and loss of data through incomplete recording strategies.

Law enforcement agencies should take the lead in collecting, maintaining, and sharing relevant data from the field. Much of the data that would be useful for the evaluation of eyewitness identification procedures have been collected in the form of administrative records and may be readily adapted for use in research. Comprehensive data should be collected on lineup composition and witness selections (i.e., fillers, non-identifications, and position of suspect in lineup).

c. Develop and adopt guidelines for the conduct and reporting of applied scientific research on eyewitness identification that conform to the highest scientific standards. All eyewitness research, including field-based studies, laboratory-based studies, and research synthesis, should use rigorous research methods and provide detailed reporting of both methods and results, including (1) pre-registration of all study protocols; (2) investigation of research questions and hypotheses informed by the needs of practice and policy; (3) adoption of strict operationalization of key measures and objective data collection; (4) development of experimental designs informed by analytical concerns; (5) use of proper statistical procedures that account for the often nontraditional nature of data in this field (e.g., estimates of effects with appropriate state-

ments of uncertainty, multiple responses from different scenarios from the same individuals, effects of order and time of presentation when important, treatment of extreme observations or outliers); (6) reporting of participant recruitment and selection and assignment to conditions; (7) complete reporting of findings including effect sizes and associated confidence intervals for both significant and non-significant effects; and (8) derivation of conclusions that are grounded firmly in the findings of the study, are framed in the context of the strengths and limitations of study methodology, and clearly state their implications for practice and policy decisions.

Strict adherence to guidelines for eyewitness identification research will result in more credible research findings that can guide policy and practice. Research that conforms to guidelines will withstand rigorous scrutiny by peers, will be verifiable through replication, and will permit inclusion in systematic reviews, leading to greater confidence in the validity and generalizability of findings.

d. Adopt rigorous standards for systematic reviews and meta-analytic studies. Meta-analyses of primary studies should be conducted only in the context of systematic reviews that locate and critically appraise *all* research findings, including those from unpublished studies. Analyses should consistently appraise and account for possible biases in the included research. Studies that do not adequately conduct or report research methods, such as randomization, should be identified in the findings. Sensitivity analyses considering impacts of lower quality or inadequately reported studies on pooled effect estimates should be conducted and reported. When attempting to draw conclusions from studies with missing data, reviewers should first attempt to contact the authors of the research for additional information. When missing data cannot be retrieved from researchers, imputation methods should, if used, be specific, transparent, and reproducible. Statistical methods for meta-analysis should conform to current best practice, using models appropriate to the level of heterogeneity of results across studies, computing both point estimates and confidence intervals around effect sizes, and translating the results of meta-analyses into terms that are both understandable and useful to practice and policy decision makers.
e. Provide basic instruction for police, prosecutors, defense counsel, and judges on aspects of the scientific method relevant to eyewitness identifications procedures (e.g., the rationale for blinded administration), including principles of research design and the uncertainties associated with data analysis. Training should cover the

importance of data collection and interpretation, including the role of standardized eyewitness identification procedures and documentation of witness statements of confidence. Competencies acquired through such training (quantitative reasoning, understanding principles of research design, and recognition of data uncertainties) are likely to apply to issues beyond eyewitness identification. For example, the knowledge and skills from training can be applied to other issues that personnel face, either in forensic science technologies or in process administration, evaluation, and quality improvement. Similarly, scientists will benefit from a greater knowledge of legal issues, standards, and procedures related to the problem of eyewitness identification. Training of both communities (law and science) will enhance communication and lead to productive collaborations.

The collaborative research initiative between researchers and law enforcement communities will be challenging as it will necessitate (1) standardized police procedures;[7] (2) systematic valid evidence collection and data entry and analysis; and (3) education and training for both researchers and law enforcement professionals on the differences between these two communities in their use of terms and considerations of standards of evidence and uncertainties in data. These three elements of a collaborative initiative are critical to advancing the science related to eyewitness identifications, as each bears directly on the integrity of the foundation upon which the efficacy and validity of current and future practices will be judged. Without such a foundation, practical advances in our scientific understanding are unlikely to occur.

The committee further recommends that the Initiative support research to better understand the following: (1) the variables that affect the accuracy, precision, and reliability of eyewitness identifications, and how those variables interact and vary in practice; (2) the (possibly joint) impact of estimator and system variables on both identification accuracy and response bias; (3) best practices for probing witness memory with the least potential for bias or contamination; (4) best strategies to assess witnesses' confidence levels when making an identification; (5) appropriate types of instructions for police, witnesses, and juries to best inform and facilitate the collection and interpretation of eyewitness identifications; (6) photo array composi-

[7]The term *standardized procedures* refers to the notion that professionals reliably follow the same set of steps or procedures. Such standardization ensures that data across cases can be considered comparable and, to a greater extent, more reliable. Although reliability is not equivalent to validity, it is essential before researchers can assess questions of validity. Without standardized procedures, valid comparisons between departments and regions of the country cannot be achieved.

tion and procedures; (7) identification procedures in the field (showups); (8) innovative technologies that might increase the reliability of eyewitness testimony (e.g., algorithm-based computer face recognition software, computer administered photo arrays, and mobile technologies with photo identification programs); and (9) the most effective means of informing jurors how to consider the factors that affect the strengths and weaknesses of eyewitness identification evidence.

Recommendation #11: Conduct Additional Research on System and Estimator Variables

Among the many variables that can affect eyewitness identification, the procedures for constructing a lineup have received the greatest attention in recent years. As discussed in Chapter 5, the question as to whether a simultaneous or sequential lineup is preferred is a specific case of the more general question of what conditions might improve the performance of an eyewitness. The answer to that question depends upon the criteria used to evaluate performance, and much of the debate has thus focused on the analysis tools for evaluation. These tools have improved significantly over the years, beginning with the use of a diagnosticity ratio, which uses the likelihood that the person identified is actually guilty as an evaluation criterion. More recently, the diagnosticity ratio approach has been augmented by analysis of Receiver Operating Characteristics (ROC analysis), which uses a measure of discriminability (i.e., a measure of how well the witness can discriminate between different possible matches to his or her memory of the face of the culprit) as an evaluation criterion. In principle, ROC analysis is a positive step, if only because it incorporates more information (i.e., the earlier diagnosticity ratio is one component of the ROC analysis). But a more complex question concerns how policy-makers and practitioners should weigh the two evaluation criteria that have been considered thus far—likelihood of guilt and discriminability—when making a decision about which lineup procedures to adopt. The answer is particularly nuanced because the two criteria do not always lead to the same conclusion; one lineup procedure may yield poorer discriminability while at the same time increasing the likelihood that the identified person is actually guilty.

The committee concludes that there should be no debate about the value of greater discriminability—to promote a lineup procedure that yields less discriminability would be akin to advocating that the lineup be performed in dim instead of bright light. For this reason, the committee recommends broad use of statistical tools that can render a discriminability measure to evaluate eyewitness performance. But a lineup procedure that improves discriminability can yield greater or lesser likelihood of correct identification, depending on how the procedure is applied (see Chapter 5).

For lineup procedures that yield greater discriminability, greater likelihood of correct identification would appear preferable and can be achieved by methods that elicit a more conservative response bias, such as a sequential (relative to simultaneous) lineup procedure.[8] The committee thus recommends a rigorous exploration of methods that can lead to more conservative responding (such as witness instructions) but do not compromise discriminability.

In view of these considerations of performance criteria and recommendations about analysis tools, can we draw definitive conclusions about which lineup procedure (sequential or simultaneous) is preferable? At this point, the answer is no. Using discriminability as a criterion, there is, as yet, not enough evidence for the advantage of one procedure over another. The committee thus recommends that caution and care be used when considering changes to any existing lineup procedure, until such time as there is clear evidence for the advantages of doing so. From a larger perspective, the identification of factors (such as specific lineup procedures or states of other system variables) that can objectively improve eyewitness identification performance must be among the top priorities for this field. This leads us to three additional recommendations.

a. The committee recommends a broad exploration of the merits of different statistical tools for use in the evaluation of eyewitness performance. ROC analysis represents an improvement over a single diagnosticity ratio, yet there are well-documented quantitative shortcomings to the ROC approach. But are there alternatives? As noted in Chapter 5, the task facing an eyewitness is a binary classification task and there exist many powerful statistical tools for evaluation of binary classification performance that are widely used, for example, in the field of machine learning. While none of these tools has been vetted for application to the problem of eyewitness identification, they offer a potentially rich resource for future investigation in this field.
b. The alternative (sequential) lineup procedure was introduced as part of an effort to improve eyewitness performance. While, as noted above, it remains unclear whether the procedure has improved eyewitness performance, that goal is still primary. In an effort to achieve that goal, many studies over the past three decades have explored the possibility that other factors may also affect performance, but until recently these investigations have not

[8]The committee stresses, however, that adoption of a more conservative response bias necessitates a compromise by which fewer lineup "picks" are made overall and thus fewer guilty suspects are identified (see Chapter 5).

evaluated performance using a discriminability measure. The committee therefore recommends a broad exploration of the effects of different system variables (e.g., additional variants on lineup procedures, witness lineup instructions) and estimator variables (e.g. presence or absence of weapon, elapsed time between incident and identification task, levels of stress) and—importantly—interactions between these variables using either the ROC approach or other tools for evaluation of binary classifiers that can be shown to have advantages over existing analytical methods.

c. Building upon the committee's call for a practice- and data-informed research agenda that incorporates input from law enforcement and the courts and establishes methodological and reporting standards for research, the committee recommends that the scientific community engaged in studies of eyewitness identification performance work closely with law enforcement to identify other system and estimator variables that might influence performance and practical issues that might preclude certain strategies for influencing performance. In addition, the committee recommends that policy decisions regarding changes in procedure should be made on the basis of evidence of superiority and should be made in consultation with police departments to determine which procedure yields the best combination of performance and practicality.

CONCLUSION

Eyewitness identification can be a powerful tool. As this report indicates, however, the malleable nature of human visual perception, memory, and confidence; the imperfect ability to recognize individuals; and policies governing law enforcement procedures can result in mistaken identifications with significant consequences. New law enforcement training protocols, standardized procedures for administering lineups, improvements in the handling of eyewitness identification in court, and better data collection and research on eyewitness identification can improve the accuracy of eyewitness identifications.

Appendixes

Appendix A

Biographical Information of Committee and Staff

CO-CHAIRS

Thomas D. Albright, Ph.D., (NAS) is Professor and Conrad T. Prebys Chair in Vision Research at the Salk Institute for Biological Studies, where he joined the faculty in 1986. Dr. Albright is also Director of the Salk Institute Center for the Neurobiology of Vision, Adjunct Professor of Psychology and Neurosciences at the University of California, San Diego, and Visiting Centenary Professor at the Indian Institute of Science, Bangalore.

Dr. Albright is an authority on the neural basis of visual perception, memory, and visually guided behavior. Probing the relationship between the activity of brain cells and perceptual state, his laboratory seeks to understand how visual perception is affected by attention, behavioral goals, and memories of previous experiences. His discoveries address the ways in which context influences visual perceptual experience and the mechanisms of visual associative memory and visual imagery. An important goal of this work is the development of therapies for blindness and perceptual impairments resulting from disease, trauma, or developmental disorders of the brain. A second aim of Dr. Albright's work is to use our growing knowledge of brain, perception, and memory to inform design in architecture and the arts, and to leverage societal decisions and public policy.

Albright received a Ph.D. in psychology and neuroscience from Princeton University in 1983. He is a recipient of numerous honors for his work, including the National Academy of Sciences Award for Initiatives in Research. Dr. Albright is a member of the National Academy of Sciences, a fellow of the American Academy of Arts and Sciences, a fellow of the

American Association for the Advancement of Science, and an associate of the Neuroscience Research Program. He is currently president of the Academy of Neuroscience for Architecture; a member of the National Academy of Sciences Committee on Science, Technology, and Law; and serves on the Scientific Advisory Committee for the Indian National Brain Research Center.

Jed S. Rakoff, J.D., has been a United States District Judge for the Southern District of New York since 1996. Prior to his appointment, he was a federal prosecutor (1973–1980) and a criminal defense lawyer at two large New York law firms (1980–1995). Judge Rakoff is coauthor of 5 books and the author of more than 110 published articles, 500 speeches, and 1,200 judicial opinions. He has been an Adjunct Professor at Columbia Law School since 1988, teaching upper class seminars in science and the law, class actions, white collar crime, and the interplay of civil and criminal law.

Judge Rakoff is a Commissioner on the National Commission on Forensic Science and is a former member of the Governance Board of the MacArthur Foundation Initiative on Law and Neuroscience. He was a member of the National Research Council Committee on the Development of the Third Edition of the Reference Manual on Scientific Evidence and the Committee on the Review of the Scientific Approaches Used During the FBI's Investigation of the 2001 *Bacillus anthracis* Mailings. He is a member of the American Academy of Arts and Sciences and the American Law Institute. He is a Judicial Fellow at the American College of Trial Lawyers, a former director of the New York Council of Defense Lawyers, and former chair of the Criminal Law Committee, New York City Bar Association.

Judge Rakoff received a B.A. from Swarthmore College in 1964, an M.Phil. from Oxford University in 1966, and a J.D. from Harvard Law School in 1969.

MEMBERS

William G. Brooks III is the Chief of the Norwood, Massachusetts Police Department. He began his tenure on May 1, 2012. He served as the Deputy Chief with the Wellesley Police Department from 2000 to 2012. As Deputy Chief, Brooks was involved in hiring, discipline, administration, budgeting, training, and multi-agency coordination. Prior to 2000, he served as a patrolman with the Westwood Police Department from 1977 to 1982 and as an officer with the Norwood Police Department from 1982 to 2000. In Norwood, he served as a patrolman and sergeant and as a detective sergeant for 14 years, supervising all criminal investigations conducted by detectives. Chief Brooks has been a police academy instructor for 30 years and a presenter on eyewitness identification for 6 years. He presents nation-

ally on behalf of the Innocence Project, is a member of the Massachusetts Supreme Judicial Court's Study Committee on Eyewitness Identification, and was the 2012 recipient of the Innocence Network's Champion of Justice Award. Chief Brooks holds a master's degree in criminal justice and is a graduate of the FBI National Academy.

Joe S. Cecil, Ph.D., J.D, is a Project Director in the Division of Research at the Federal Judicial Center. Currently, he is directing the Center's Program on Scientific and Technical Evidence. As director, Dr. Cecil is responsible for judicial education and training in the area of scientific and technical evidence and served as principal editor of the first two editions of the Center's *Reference Manual on Scientific Evidence,* which is the primary source book on evidence for federal judges. He also has published several articles on the use of court-appointed experts. Dr. Cecil is currently directing a research project that examines the difficulties that arise with expert testimony in federal courts, with an emphasis on clinical medical testimony and forensic science evidence. Other areas of research interest include federal civil and appellate procedure, jury competence in complex civil litigation, and assessment of rule of law in emerging democracies. Dr. Cecil serves on the editorial boards of social science and legal journals. He previously served on the National Academies' Panel on Confidentiality and Data Access and the Committee on Identifying the Needs of the Forensic Sciences Community. He currently is a member of the National Academy of Sciences' Committee on Science, Technology, and Law and was a member of its Access to Research Data: Balancing Risks and Opportunities subcommittee. Dr. Cecil received his doctorate (in psychology) and law degree from Northwestern University.

Winrich Freiwald, Ph.D., is Assistant Professor, Laboratory of Neural Systems, The Rockefeller University. Dr. Freiwald is interested in the neural processes that form object representations as well as those that allow attention to make those representations available for social behavior and cognition. Dr. Freiwald co-discovered a specialized neural machinery for face processing located in the temporal and frontal lobes of the brain. He and his colleagues further showed that this machinery is composed of a small network of a fixed number of face selective regions, termed face patches, each dedicated to a different aspect of face processing and all closely connected with each other. Dr. Freiwald's laboratory aims to understand the inner workings of this system, from the level of individual cells to the interactions of brain areas, in order to answer questions such as: How does face selectivity emerge in a single cell? How is information transformed from one face patch to another? What is the contribution of each face patch to different face recognition abilities like the recognition of

a friend or a smile? How do the different face patches interact in different tasks? And how is information extracted from a patch when a perceptual decision is made?

Dr. Freiwald, a native of Oldenburg, Germany, performed his graduate work at the Max Planck Institute for Brain Research in Frankfurt and received his Ph.D. from Tübingen University in 1998. He then joined the Institute for Brain Research at the University of Bremen as a lecturer. Starting in 2001, he worked as a postdoctoral fellow at the Massachusetts Institute of Technology, Massachusetts General Hospital, Harvard Medical School, and the Hanse Institute for Advanced Study in Delmenhorst, Germany. He was head of the primate brain imaging group at the Centers for Advanced Imaging and Cognitive Sciences in Bremen from 2004 to 2008 and a visiting associate at the California Institute of Technology in 2009. He joined The Rockefeller University as assistant professor in 2009. Dr. Freiwald was named a Pew Scholar in 2010, a McKnight Scholar in 2011, and a NYSCF—Robertson Neuroscience Investigator in 2013.

Brandon L. Garrett is the Roy L. and Rosamond Woodruff Morgan Professor of Law at the University of Virginia Law School. Garrett joined the law faculty in 2005. His research and teaching interests include criminal procedure, wrongful convictions, habeas corpus, corporate crime, scientific evidence, civil rights, civil procedure, and constitutional law.

Mr. Garrett's recent research includes studies of DNA exonerations, organizational prosecutions, and eyewitness identification procedures in Virginia. In 2011, Harvard University Press published Mr. Garrett's book, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong*, examining the cases of the first 250 people to be exonerated by DNA testing. In 2013, Foundation Press published his co-authored casebook, *Federal Habeas Corpus: Executive Detention and Post-Conviction Litigation*. Mr. Garrett is currently completing a new book, in contract with Harvard University Press, examining corporate prosecutions.

Mr. Garrett attended Columbia Law School, where he was an articles editor of the *Columbia Law Review* and a Kent Scholar. After graduating, he clerked for the Honorable Pierre N. Leval of the United States Court of Appeals for the Second Circuit. He then worked as an associate at Neufeld, Scheck & Brustin LLP in New York City.

Karen Kafadar, Ph.D., is Commonwealth Professor and Chair of Statistics at the University of Virginia. Dr. Kafadar received her B.S. in mathematics and M.S. in statistics at Stanford University and her Ph.D. instatistics from Princeton University. Before joining the Statistics Department in 2014, she was Mathematical Statistician at the National Institute of Standards and Technology, member of the technical staff at Hewlett Packard's

RF/Microwave R&D Department, Fellow in the Division of Cancer Prevention at National Cancer Institute, Professor and Chancellor's Scholar at University of Colorado-Denver, and Rudy Professor of Statistics at Indiana University-Bloomington. Her research focuses on robust methods, exploratory data analysis, characterization of uncertainty in the physical, chemical, biological, and engineering sciences, and methodology for the analysis of screening trials, with awards from CDC, American Statistical Association (ASA), and American Society for Quality.

Kafadar was editor of *Technometrics* and the review section of the *Journal of the American Statistical Association* and is currently Biology, Medicine, and Genetics Editor for *The Annals for Applied Statistics*. She has served on several National Research Council committees and is a past or present member on the governing boards for ASA, Institute of Mathematical Statistics, International Statistical Institute, and National Institute of Statistical Sciences. She is a Fellow of the ASA, the American Association for the Advancement of Science, and the International Statistics Institute; she has authored more than 100 journal articles and book chapters; and has advised numerous M.S. and Ph.D. students.

A.J. Kramer, J.D., is Federal Public Defender for the District of Columbia. He earned a Bachelor's of Arts from Stanford University (1975), followed by a Juris Doctorate from the Boalt Hall School of Law at the University of California at Berkeley (1979). Mr. Kramer clerked for the Honorable Procter Hug, Jr., at the United States Court of Appeals for the Ninth Circuit in Reno, Nevada. He spent seven years as an Assistant Federal Public Defender in San Francisco, California, followed by three years as the Chief Assistant Federal Public Defender in Sacramento, California. He taught legal research and writing at Hastings College of the Law, University of California, San Francisco from 1982 to 1988. Mr. Kramer was appointed Federal Public Defender for the District of Columbia in 1990.

A permanent faculty member at the National Criminal Defense College in Macon, Georgia, and at the Western Trial Advocacy Institute in Laramie, Wyoming, Mr. Kramer is a Fellow of the American College of Trial Lawyers. He is currently a member of the American Bar Association Criminal Justice Section Council and a member of the United States Judicial Conference Advisory Committee on the Rules of Evidence.

Scott McNamara, J.D., graduated from Syracuse University with a major in mathematics. Mr. McNamara attended Vermont Law School, graduating *cum laude* in 1991. On July 20, 1992, he became an Oneida County Assistant District Attorney. As such, he handled thousands of cases with a concentration in narcotic and homicide prosecutions. McNamara was the Bureau Chief of the Narcotics Unit for twelve years, and he was also

the First Assistant District Attorney for six years. During his years in the District Attorney's Office, he was a member and the lead prosecutor assigned to the Oneida County Drug Task Force. He also chaired the Oneida County District Attorney's Office Death Penalty Committee. From 2001 to 2006, Mr. McNamara represented the District Attorney's Office on the Joint Terrorism Task Force. In January of 2007, Mr. McNamara took office as the Oneida County District Attorney and has since been elected, and re-elected, by the citizens of Oneida County. His tenure as District Attorney has been one of proactive engagement and problem-solving. He has created an Economic Crime Unit, a Conviction Integrity Unit, and he has appointed a community liaison to improve communication and accessibility between the District Attorney's Office and the diverse population it serves. In addition, Mr. McNamara initiated a strategy of video recording all police interrogations in Oneida County. He has always maintained that his goal as the county's chief law enforcement officer is to continue the legacy of bringing justice to those victimized by crime while recognizing the need to safeguard and enhance fairness within the legal system.

For 10 years, Mr. McNamara taught search and seizure at the Mohawk Valley Police Academy. He was also an adjunct instructor at Mohawk Valley Community College, where he taught both criminal law and constitutional criminal procedural law. McNamara currently is an adjunct instructor at Utica College, where he teaches legal concepts of criminal fraud.

Charles Alexander Morgan III, M.D., is Associate Clinical Professor of Psychiatry, Yale University School of Medicine. Over the course of twenty years at Yale University and the Neurobiological Studies Unit of National Center for Posttraumatic Stress Disorder, Dr. Morgan's neurobiological and forensic research has established him as an international expert in posttraumatic stress disorder (PTSD), in eyewitness memory, and in human performance under conditions of high stress. He is a forensic psychiatrist and has testified as an expert on memory and PTSD at the International Tribunal on War Crimes, the Hague, Netherlands. Dr. Morgan is subject matter expert in the selection and assessment of U.S. Military Special Operations and Special Mission Units. His work has provided insight into the psycho-neurobiology of resilience in elite soldiers and has contributed to the training mission of U.S. Army special programs. For his work in the special operations community, Dr. Morgan was awarded the U.S. Army Award for Patriotic Service in 2008. In 2010, Dr. Morgan was awarded the Sir Henry Welcome Medal and Prize for his research on enhancing cognitive performance under stress in special operations personnel. In 2011, Dr. Morgan deployed to Afghanistan as an operational advisor with the Asymmetric Warfare Group.

Elizabeth A. Phelps, Ph.D., is Silver Professor of Psychology and Neural Science at New York University. Her research examines the cognitive neuroscience of emotion, learning, and memory. Her primary focus has been to understand how human learning and memory are changed by emotion and to investigate the neural systems mediating their interactions. She has approached this topic from a number of different perspectives, with an aim of achieving a more global understanding of the complex relations between emotion and memory. As much as possible, Dr. Phelps has tried to let the questions drive the research, not the techniques or traditional definitions of research areas. Dr. Phelps has used a number of techniques (behavioral studies, physiological measurements, brain-lesion studies, fMRI) and has collaborated with a number of people in other domains (social and clinical psychologists, psychiatrists, neuroscientists, economists, physicists). Dr. Phelps received a Ph.D. in neuroscience from Princeton University.

Daniel J. Simons, Ph.D., is a professor in the department of psychology at the University of Illinois, where he heads the Visual Cognition Laboratory. His research explores the limits of awareness and memory, the reasons why we often are unaware of those limits, and the implications of such limits for our personal and professional lives. He is best known for his research that demonstrates how people are far less aware of their visual surroundings than they think.

Dr. Simons received his B.A. from Carleton College and his Ph.D. in experimental psychology from Cornell University. He then spent 5 years on the faculty at Harvard University before being recruited to Illinois in 2002. He has published more than 50 articles for professional journals, and his work has been supported by the National Institutes of Health, the National Science Foundation, and the Office of Naval Research. He is a Fellow and Charter Member of the Association for Psychological Science and an Alfred P. Sloan Fellow, and he has received many awards for his research and teaching, including the 2003 Early Career Award from the American Psychological Association. His research adopts methods ranging from real-world and video-based approaches to computer-based psychophysical techniques, and it includes basic behavioral measures, survey and individual-difference methods, simulator studies, and training studies. This diversity of approaches helps establish closer links between basic research on the mechanisms of attention, perception, memory, and awareness and how those mechanisms operate in the real world.

In addition to his scholarly research, Dr. Simons is the co-author (with Christopher Chabris) of the *New York Times* bestselling book, *The Invisible Gorilla*. He has penned articles for the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, and the *Chicago Tribune* (among others), and he appears regularly on radio and television.

Anthony D. Wagner, Ph.D., is a Professor of Psychology and Neuroscience and Co-Director, Center for Cognitive and Neurobiological Imaging, Stanford University. He is also Director of the Stanford Memory Laboratory. At Stanford since 2003, Dr. Wagner's research explores how the brain supports learning, memory, and executive function. In addition to his basic science, his research examines memory dysfunction in clinical populations and the role of neuroscience evidence in legal and educational settings. He is on the faculty in the Psychology Department and participates in the Neurosciences Program, the Symbolic Systems Program, the Human Biology Program, and the Stanford Center for Longevity. Externally, he is a member of the MacArthur Foundation's Research Network on Law and Neuroscience. He is a Fellow of the American Association for the Advancement of Science, and a recipient of the American Psychological Association's Distinguished Scientific Award for Early Career Contribution, among other honors. Dr. Wagner received a Ph.D. in psychology from Stanford University in 1997.

Joanne Yaffe, Ph.D., is Professor, College of Social Work, University of Utah and Adjunct Professor of Psychiatry, College of Medicine, University of Utah. Her scholarly interests are in evidence based practice and using scientific knowledge for policy and practice decisions. She is particularly interested in the synthesis of research through systematic reviews and meta-analysis, and, with colleagues in the United Kingdom, was funded by the Cochrane Collaboration to develop guidelines for reporting systematic reviews without included studies. She is affiliated with the Social Welfare Coordinating Group and the Knowledge Translation Group of the Campbell Collaboration and has worked with the Methods Group of the Cochrane Collaboration. Dr. Yaffe is a member of the International Advisory Group for CONSORT-SPI, which has developed guidelines for the reporting of randomized trials for complex social and psychological interventions. Dr. Yaffe received a B.S. in Psychology from University of Massachusetts, an M.S.W. from the University of Michigan, and a Ph.D. in Social Work and Psychology from the University of Michigan. She has advanced training in systematic reviews and meta-analysis.

STAFF

Anne-Marie Mazza, Ph.D., is the Director of the Committee on Science, Technology, and Law. Dr. Mazza joined the National Academies in 1995. She has served as Senior Program Officer with both the Committee on Science, Engineering and Public Policy and the Government-University-Industry Research Roundtable. In 1999, she was named the first director of the Committee on Science, Technology, and Law, a newly created activity

designed to foster communication and analysis among scientists, engineers, and members of the legal community. Dr. Mazza has been the study director on numerous Academy reports including, *Reference Manual on Scientific Evidence*, 3rd Edition (2011); *Review of the Scientific Approaches Used During the FBI's Investigation of the 2001 Anthrax Letters* (2011); *Managing University Intellectual Property in the Public Interest* (2010); *Strengthening Forensic Science in the United States: A Path Forward* (2009); *Science and Security in A Post 9/11 World* (2007); *Reaping the Benefits of Genomic and Proteomic Research: Intellectual Property Rights, Innovation, and Public Health* (2005); and *Intentional Human Dosing Studies for EPA Regulatory Purposes: Scientific and Ethical Issues* (2004). Between October 1999 and October 2000, Dr. Mazza divided her time between the National Academies and the White House Office of Science and Technology Policy, where she served as a Senior Policy Analyst responsible for issues associated with a Presidential Review Directive on the government-university research partnership. Before joining the Academy, Dr. Mazza was a Senior Consultant with Resource Planning Corporation. She is a fellow of the American Association for the Advancement of Science. Dr. Mazza was awarded a B.A., M.A., and Ph.D. from The George Washington University.

Arlene F. Lee, J.D., is the Board Director for the Committee on Law and Justice (CLAJ). Prior to joining CLAJ, Ms. Lee was the Director of Policy at the Center for the Study of Social Policy, where she focused on helping federal and state elected officials develop research-informed policies and funding to improve results for children and families. In this capacity, she oversaw PolicyforResults.org, a leading national resource for results-based policy. Previously she was the Executive Director of the Maryland Governor's Office for Children, where she chaired the Children's Cabinet and was responsible for the cabinet's fund of 60+ million dollars annually. She has served as the Deputy Director of the Georgetown University Center for Juvenile Justice Reform, Director of the Federal Resource Center for Children of Prisoners, and Youth Strategies Manager for the Governor's Office of Crime Control and Prevention. Ms. Lee is also the author of numerous articles and coauthored *The Impact of the Adoption and Safe Families Act on Children of Incarcerated Parents*. She has a B.A. in Sociology from Washington College and a J.D. from Washington College of Law, American University. As a result of her work, Ms. Lee was named one of Maryland's Top 100 Women and has received three Governor's Citations.

Steven Kendall, Ph.D., is Program Officer for the Committee on Science, Technology, and Law. Dr. Kendall has contributed to numerous Academy reports including the *Reference Manual on Scientific Evidence*, 3rd Edition (2011); *Review of the Scientific Approaches Used During the FBI's Inves-*

tigation of the 2001 Anthrax Mailings (2011); *Managing University Intellectual Property in the Public Interest* (2010); and *Strengthening Forensic Science in the United States: A Path Forward* (2009). Dr. Kendall received his Ph.D. from the Department of the History of Art and Architecture at the University of California, Santa Barbara, where he wrote a dissertation on 19th century British painting. He received his M.A. in Victorian Art and Architecture at the University of London. Prior to joining the National Research Council in 2007, Dr. Kendall worked at the Smithsonian American Art Museum and The Huntington in San Marino, California.

Karolina Konarzewska is Program Coordinator for the Committee on Science, Technology, and Law. Ms. Konzarzewska received a B.A. in Political Science from the College of Staten Island, City University of New York and an M.A. in International Relations, New York University. Prior to joining The National Academies, she worked at various research institutions in Washington, DC, where she covered political and economic issues pertaining to Europe, Russia, and Eurasia.

Appendix B

Committee Meeting Agendas

Meeting 1
Washington, DC
Monday, 2 December 2013

OPEN SESSION

8:00	Continental Breakfast
8:30	Opening Remarks and Introductions
	Co-chairs:
	Thomas D. Albright, Salk Institute for Biological Studies Jed S. Rakoff, U.S. District Court for the Southern District of New York
8:45–9:30	Charge to the Committee
	Speaker:
	Anne Milgram, Laura and John Arnold Foundation
9:30–11:00	The Science of Memory—A Dynamic Process

Speakers:

Daniel L. Schacter, Harvard University (via videoconference)
John T. Wixted, University of California, San Diego

11:00–11:15 Break

11:15–12:00 Overview of Eyewitness Identification

Speaker:

Gary L. Wells, Iowa State University

12:00–1:00 Lunch

1:00–2:30 Meta-Analytical Reviews of System and Estimator Variables

Speakers:

Nancy K. Steblay, Augsburg College
Christian A. Meissner, Iowa State University
Kenneth Deffenbacher, University of Nebraska at Omaha

2:30–3:00 Strengths and Weaknesses of Eyewitness Research Methodologies

Speaker:

Steven D. Penrod, John Jay College of Criminal Justice

3:00–3:30 General Acceptance of Eyewitness Testimony Research

Speaker:

Saul Kassin, John Jay College of Criminal Justice

3:30–3:45 Break

3:45–4:15 Simultaneous and Sequential Lineups

Speaker:

Roy S. Malpass, University of Texas at El Paso

4:15–5:15 Perspectives on Eyewitness Identification

Speakers:

John Firman, International Association of Chiefs of Police
David LaBahn, Association of Prosecuting Attorneys
Kristine Hamann, National District Attorney's Association
Barry Scheck, The Innocence Project

Tuesday, 3 December 2013

CLOSED SESSION: 8:00–9:15

OPEN SESSION

9:30–10:15 Police Practices

Speakers:

Joseph Salemme, Chicago Police Department
Rob Davis, Police Executive Research Forum

10:15–11:45 Judicial Findings and Recommendations—Including Jury Instructions

Speakers:

The Honorable Robert J. Kane, Supreme Judicial Study Group on Eyewitness Identification (MA)
The Honorable Geoffrey Gaulkin, Special Master, *State v. Henderson* (NJ)
The Honorable Paul De Muniz, Oregon Supreme Court
The Honorable Barbara Hervey, Texas Court of Criminal Appeals

11:45–12:30 Research on Jury Instructions

Speakers:

Shari Seidman Diamond, Northwestern University and American Bar Foundation
David V. Yokum, University of Arizona

CLOSED SESSION: 12:30–2:00

Meeting 2
Washington, DC
Thursday, 6 February 2014

OPEN SESSION

8:30–8:45 Opening Remarks and Introductions

Co-chairs:

Thomas D. Albright, Salk Institute for Biological Studies
Jed S. Rakoff, U.S. District Court for the Southern District of New York

8:45–9:30 The Illinois Pilot Program on Sequential Double-Blind Identification Procedures

Speaker:

Sheri Mecklenburg, U.S. Department of Justice

9:30–10:15 Face Recognition and Human Identification

Speaker:

P. Jonathon Phillips, National Institute of Standards and Technology

10:15–10:30 Break

10:30–11:15 Evaluating Eyewitness Research in Court: Moving from General to Specific Inference

Speaker:

John Monahan, University of Virginia

11:15–12:00 Eyewitness Identification from the Perspective of State Attorney Generals

Speaker:

Peter Kilmartin, State of Rhode Island

12:00–12:45 Lunch

12:45–1:30 Costs and Benefits of Eyewitness Identification Reforms

Speaker:

Steven E. Clark, University of California, Riverside

1:30–2:30 Misinformation and the Creation of False Memories

Speaker:

Elizabeth Loftus, University of California, Irvine—via videoconference

2:30–3:15 Obtaining Better Descriptive Information: The Use of the Cognitive Interview

Speaker:

Ronald Fisher, Florida International University

CLOSED SESSION: 3:30–5:30

1.0. Although Table 2 in Juslin, Olsson, and Winman provides the counts (numbers of trials), it does not tabulate the accuracies (numbers of correct responses). One can estimate these accuracies by weighted averages of the displayed percentages shown in the plots in their Figure 2[4] for the "suspect-similarity condition" ("A" = 0.27, 0.38, 0.51, 0.55, 0.87; n = 15, 21, 25, 29, 51) and for the "culprit-description condition" ("A" = 0.18, 0.66, 0.63, 0.90, 0.91; n = 10, 18, 28, 41, 37). In the confidence level categories (15%, 35%, 55%, 75%, 95%), the accuracies (with their standard errors and the total sample sizes on which they are based following them in parentheses) are, respectively, 23.4% (8.5%, n = 25), 50.9% (8.0%, n = 39), 52.6% (6.9%, n = 53), 75.5% (5.1%, n = 70), and 88.7% (3.4%, n = 88). For these data, both the unweighted correlation coefficient, 0.9766 (t-statistic = 7.865, p-value 0.004), and the slope of the weighted linear regression (points weighted inversely proportional to their standard errors), 0.773 (standard error 0.085, p-value 0.003), are statistically significant, in that such convincing data of a relationship between correlation and accuracy would be unlikely to arise if, in fact, no association existed.

Another method for assessing the significance of the unweighted correlation is through the simulation of a large number of trials on the basis of the data that were observed. For each trial, one can first simulate five confidence values, uniformly distributed between the endpoints that were observed: c_1 is uniformly distributed between (0.05, 0.25) (mean is the observed 0.15); c_2 is uniformly distributed between (0.25, 0.45) (mean is the observed 0.35); ... c_5 is uniformly distributed between (0.85, 1.00). Next, one simulates five proportions using the observed conditions: a_1 is a binomial variate (n = 25, p = 0.234) divided by n = 25; a_2 is a binomial variate (n = 39, p = 0.509) divided by n = 39; ... a_5 is a binomial variate (n = 88, p = 0.887) divided by n = 88. For each trial with five simulated c values and their five corresponding a values, one calculates a Pearson correlation coefficient. Figure C-1 shows a plot of the five data points, with limits of one standard error on the estimated accuracies (left panel) and the histogram of the 1,000 simulated Pearson correlation coefficients (right panel). The median is 0.9534 (close to the observed 0.9766), the upper and lower quartiles are 0.916 and 0.977, and the central 90% of the 1,000 values lie between 0.8650 and 0.993. Thus, an approximate 90% confidence interval for the true correlation coefficient (0.865, 0.993) definitely does not include zero, a further indication of the significance of the Pearson correlation coefficient.

The example above illustrates the importance of incorporating known uncertainty in the estimated accuracy for the confidence level category. The relationship between confidence and accuracy should take into account (1)

[4]See pages 1310–1311 of Juslin, Olsson, and Winman for the data in their Table 2 and Figure 2, respectively.

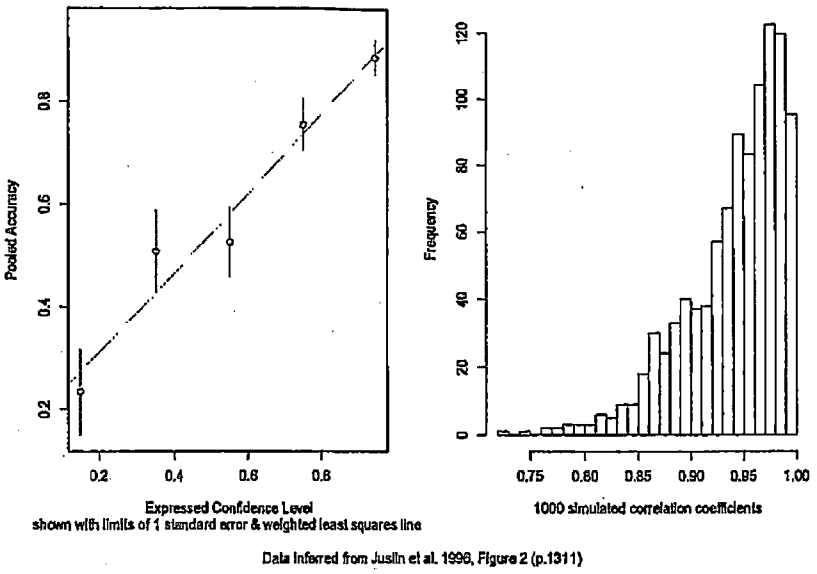


FIGURE C-1 Data Inferred from Juslin, Olsson, and Winman.
NOTE: Adapted from Juslin, Olsson, and Winman, "Calibration and Diagnosticity of Confidence in Eyewitness Identification." The left panel plots confidence-accuracy data from p. 1311. Data are pooled into five categories; accuracies are inferred from p. 1313. Data are shown with limits of one standard error and weighted least squares regression line. The right panel is a histogram of 1000 simulated Pearson correlation coefficients, using data from 5 categories shown in right panel. The central 90% of the simulated values lie between 0.853 and 0.993, indicating that the true unweighted Pearson correlation coefficient is significantly different from zero. Courtesy of Karen Kafadar.

the repeated responses of a limited number of "eyewitnesses" in the study and (2) the uncertainty in an eyewitness' "expressed confidence level." The 2009 National Research Council report, *Strengthening Forensic Science in the United States: A Path Forward*, cited studies in which fingerprint examiners reached different conclusions when presented with exactly the same evidence at a later time.[5] Quite possibly, in many of these laboratory studies on which these confidence–accuracy relationships are based, participants

[5]National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* (Washington, DC: The National Academies Press, 2009), p. 139.

may express different levels of confidence if presented with exactly the same set of circumstances and procedures 6 months later.

The existing literature varies in its assessment of the significance of the confidence–accuracy relationship, with some articles suggesting a very strong relationship and many others suggesting that the relationship is weak or nonexistent. The lack of significance in the confidence–accuracy relationship may result from other factors not taken into account. For example, Smalarz and Wells suggest that restricting the plot to only those data corresponding to "choosers" may strengthen the relationship.[6] Other factors that might affect the relationship include the presence or absence of weapon, the level of stress during the incident, and the length of exposure to the perpetrator. Roediger and colleagues state that

> the simple assumption usually made that confidence and accuracy are always tightly linked is wrong...the relation between confidence and accuracy depends on the method of analysis, on the target material being remembered, on who is doing the remembering, and (in situations where memory is tested by recognition) on the nature of the lures and distractors. In addition, there is more than one way to measure the relationship between confidence and accuracy, and not every way is equally relevant to what courts of law would like to know about the issue.[7]

Studies that incorporate numerous variables, as well as soliciting a confidence statement at various times (e.g., immediately, or 10 minutes after the incident, or 1 hour after the incident), would be valuable.

RECEIVER OPERATING CHARACTERISTIC ANALYSIS

A receiver operator characteristic (ROC) is a reliable, time-honored assessment of test performance. ROC has been used for decades in the medical test diagnostic literature. Conventionally, as noted in Chapter 5, two procedures were compared using a single diagnosticity ratio: $DR = HR/FAR$ = *hit rate/false alarm rate,* or *sensitivity / (1 – specificity)*. Wixted and colleagues observed that the diagnosticity ratio, *DR*, can vary depending

[6]L. Smalarz and G. L. Wells, "Eyewitness Certainty as a System Variable," in *Reform of Eyewitness Identification Procedures*, ed. B. L. Cutler (Washington, DC: American Psychological Association, 2013), 161–177.

[7]Roediger, Wixted, and DeSoto, "The Curious Complexity Between Confidence and Accuracy in Reports from Memory.

on an eyewitness' ECL and hence proposed the use of an ECL-based ROC curve to compare two lineup procedures (simultaneous versus sequential).[8]

The ECL-based ROC curve for a given procedure (e.g., simultaneous) is constructed as follows:

1) Collect participants in a study and subject them to the experimental conditions.
2) For each participant, record whether she or he accurately selected the correct suspect or accurately passed over the filler and the expressed confidence level in the decision.
3) Collect all the responses for participants who answered "100% confident" (say, n_1 of them) and record the combined *FAR* (false alarm rate, or 1 – specificity) and *HR* (hit rate, or sensitivity) across n_1 participants (FAR_1, HR_1).
4) Repeat step 3 for all participants who answered "90% confident" (or higher; say, $n_{0.9}$ of them), resulting in the data pair ($FAR_{0.9}$, $HR_{0.9}$).
5) Repeat step 3 for all participants who answered "80% confident" (or higher; say, $n_{0.8}$), resulting in the data pair ($FAR_{0.8}$, $HR_{0.8}$).
6) Continue to repeat step 3 for the groups of participants who answered "70% confident" ... "10% confident" (or higher; say, $n_{0.7}$... $n_{0.1}$ of them).
7) Plot the 10 data pairs, (FAR_1, HR_1), ..., ($FAR_{0.1}$, $HR_{0.1}$).

This plot results in the ROC curve, whose points (*HR*, *FAR*) correspond to different ECLs.

The plotted points usually are connected by straight lines, and the slope of the ROC curve at each of those plotted points represents the *DR* corresponding to that confidence category. The ROC curve illustrates the separate *DR*s rather than calculating a single *DR* collapsed across all confidence categories. As with the confidence–accuracy relationship, it is important to recognize the uncertainty in the estimated (*FAR*, *HR*) data points. How does the uncertainty in *FAR* and *HR*, and hence in the diagnosticity ratio (*DR* = *HR*/*FAR*), translate into uncertainty into the ROC curve?

The effect of uncertainty in estimates of *HR*, *FAR*, *DR* (= *HR*/*FAR*) on the ROC curve can be seen by simulating new *HR* and *FAR* rates,

[8]L. Mickes, H. D. Flowe, and J. T. Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory: Comparing the Diagnostic Accuracy of Simultaneous and Sequential Lineups," *Journal of Experimental Psychology: Applied* 18: 361–376 (2012). See especially pp. 362–365 for a description of ROC analysis in the medical literature and applied to the eyewitness identifications.

assuming that the observed HR and FAR rates are true "means" from the simulated distributions. As a first example, consider the set of data from Brewer and Wells[9] which is cited by Mickes, Flowe, and Wixtedin their Table 1.[10] The data are: *HR* = (.090,.237,.320,.355,.370); *FAR* = (.002,.015,.030,.038,.041), leading to five diagnosticity ratios (rounded) *DR* = (45,16,11,9,9). The article states that the experiment involved 1,200 participants.

As above, one can simulate each of the five hit rates and the five false alarm rates, with 4,000 independent trials and 1,200 participants, in such a way that the means of the five distributions of hit rates (*HRs*) and the means of the five distributions of false alarm rates (*FARs*) equal the values observed in the experiment [e.g., 0.090, 0.237, 0.320, 0.355, 0.370 for *HR* and (0.002, 0.015, 0.030, 0.038, 0.041) for *FAR*], leading to five distributions of 4,000 diagnosticity ratios (*HR/FAR*). For example, consider simulating 1,200 individuals whose *HR* is 0.090 = 9.0%. One expects that, on average, about (9%) × 1,200 = 108 of the simulated 1,200 participants will have "hits." When repeating this trial of 1,200 individuals, the number might be 110, or 95, or some other number around, but usually not exactly, 108. Repeating the trial 4,000 times, one can average the 4,000 numbers (e.g., 108, 110, 95...) and divide by 1,200, yielding a mean simulated *HR*. The advantage is that one can also use the 4,000 numbers to calculate a standard deviation.[11] One repeats exactly the same exercise for the five *FAR* rates, yielding a mean *FAR* and a standard deviation, SD_{FAR}. As noted in Chapter 5, in real life, *HR* and *FAR* will be estimated on the same set of 1,200 participants, so the two numbers, *HR* and *FAR*, in the five (*HR*, *FAR*) pairs, will be correlated. In the simulation, *HR* and *FAR* are independent, so the estimated uncertainties are likely to be optimistic; the real uncertainties could well be larger. One can then plot three sets of points (each set contains five points): (1) (mean *HR*, mean *FAR*) (this plot should look qualitatively similar to the one in Figure 6(A) in Mickes, Flowe and Wixted;[12] (2) (mean $HR - SD_{HR}$, mean $FAR - SD_{FAR}$) [these points should lie somewhat below the points plotted in (1)[; and (3) (mean $HR + SD_{HR}$, mean $FAR + SD_{FAR}$) [these points should lie somewhat above the points plotted in (1)].

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[9]N. Brewer and G. L. Wells, "The Confidence-Accuracy Relationship in Eyewitness Identification: Effects of Lineup Instructions, Foil Similarity, and Target-Absent Base Rates," *Journal of Experimental Psychology: Applied* 12(1): 11–30 (2012) (as cited by Mickes et al., Table 1, p. 367).

[10]Mickes, Flowe, and Wixted, p. 367.

[11]Or Standard Deviation Hit Rate (SD_{HR}), which also can be obtained from standard formulas for the standard deviation of the binomial distribution. See G. Snedecor and W. Cochran, *Statistical Methods, Sixth Ed.* (Ames, Iowa: Iowa State University Press, 1967).

[12]Mickes, Flowe, and Wixted, p. 371.

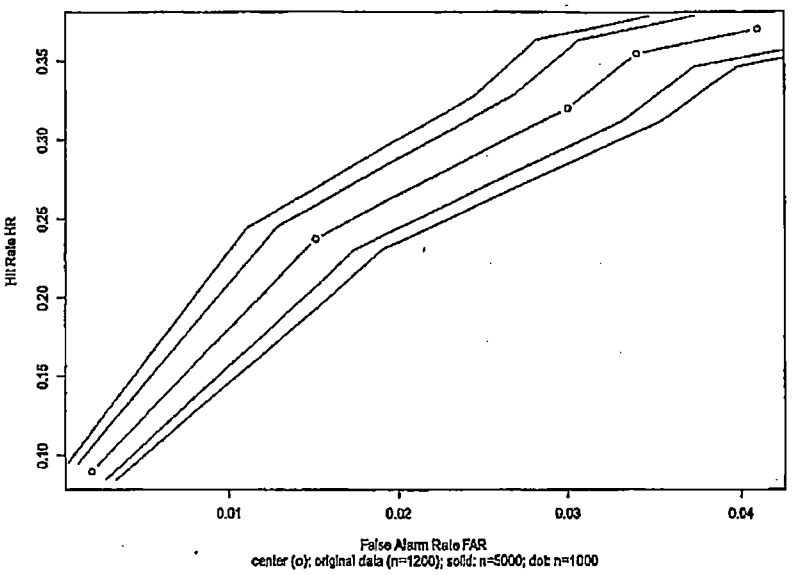


FIGURE C-2 Data from Brewer and Wells.
NOTE: Adapted from Brewer and Wells, "The confidence-accuracy relationship in eyewitness identification." The data are cited by Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory." Courtesy of Karen Kafadar.

Figure C-2 shows bands of one standard error in both *HR* and *FAR*, illustrating one source of uncertainty in the ROC curve due to estimating *HR* and *FAR*. The same approach to calculating uncertainties was used for the two sets of (*HR*, *FAR*) values given by the "simultaneous" and "sequential" data in Mickes, Flowe, and Wixted, Table 3.[13] The text indicates that Experiment 1A used $n = 598$ participants, so the simulation assumed $n = 600$. In Figure C-3, "M" refers to "siMultaneous," and "Q" refers to "seQuential." Note that the "M" and "Q" points fall roughly in the same pattern as in Mickes, Flowe, and Wixted's Figure 6A.[14] Note the substantial overlap in the bands of "one standard deviation" surrounding each of the data points, indicating no "statistically significant" differences between the "M" (simultaneous) and "Q" (sequential) points.[15] If one were to take

[13]Ibid, p. 372.
[14]Ibid, p. 371.
[15]The bands of two standard deviations would overlap even more.

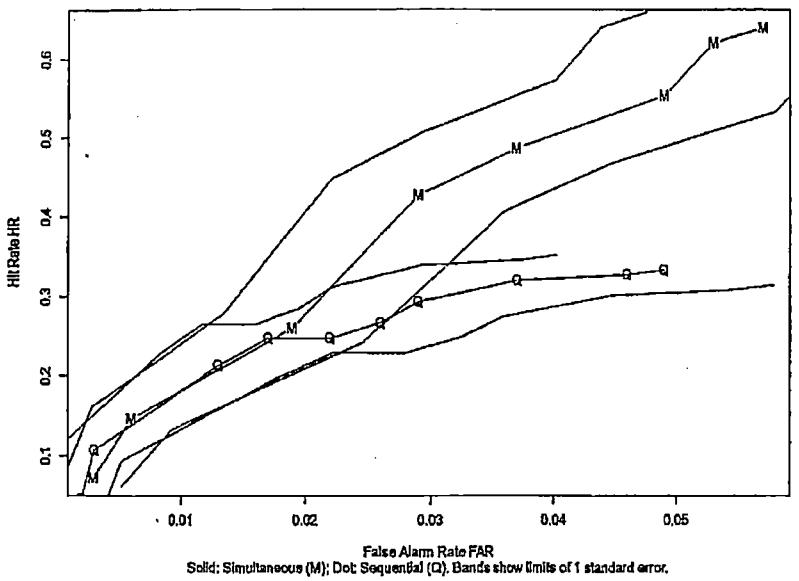


FIGURE C-3 Data from Experiment 1A in Mickes, Flowe, and Wixted.
NOTE: Adapted from Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory." Courtesy of Karen Kafadar.

into account the effects of using the *same* eyewitness in the same study with different responses to different tasks, the variability would be even larger.

When the same exercise is repeated for the data in Experiment 2 (n=631), similarly ambiguous results (see Figure C-4) are obtained. As Mickes and colleagues suggest, the differences between simultaneous and sequential are even less impressive, and especially so once bands of one standard errors around the points are shown.

These further analyses on these published data sets suggest the following conclusions.

1) The strength of the confidence-accuracy relationship involves uncertainty in the measures of both A (accuracy) and C (confidence), as well as other factors that can influence the relationship.
2) A ROC curve incorporates more information than a single *DR* (diagnosticity ratio = *HR*/*FAR*) using a third variable [different test thresholds in the medical literature; in the present context, different expressed confidence levels (ECLs); i.e., *HR* and *FAR* at

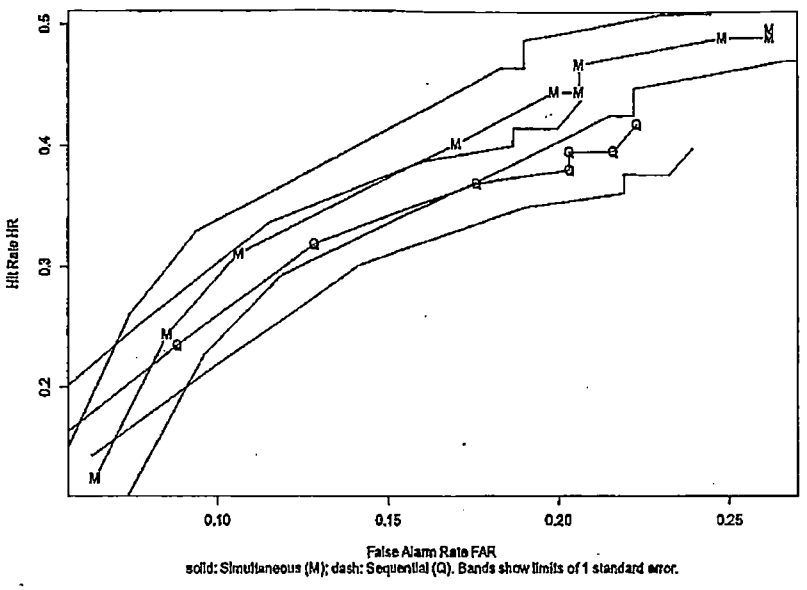


FIGURE C-4 Data from Experiment 2 in Mickes, Flowe, and Wixted.
NOTE: Adapted from Mickes, Flowe, and Wixted, "Receiver Operating Characteristic Analysis of Eyewitness Memory." Courtesy of Karen Kafadar.

different expressed confidence levels]. As is true with any data, the data from which a ROC is constructed (*FAR*s, *HR*s, expressed confidence levels) have uncertainty, and that uncertainty is passed on to the ROC. A comparison of two ROCs without recognizing that uncertainty can be misleading. As with any tool, one must be careful in how one draws inferences when comparing ROC curves.

3) Other methods for comparing two procedures (in which the outcome is a binary classification such as "identification" / "no identification" of an individual) exist in other literature.[16]

These analyses considered only the most obvious form of random measurement error. The ROC may be influenced by other sources of bias; these sources are not considered or displayed in the plots shown here (see Chapter 5). Also, the ROC curve takes into consideration only the prob-

[16]See, e.g., T. Hastie, R. Tibshirani, and J.H. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction* (New York: Springer, 2009) for a discussion on classification and evaluation methods of statistical machine learning research.

ability that an eyewitness who makes a positive identification of a suspect has correctly identified the true culprit (positive predictive value); it does not take into consideration the rule-out probability that an eyewitness who fails to make an identification of a suspect has correctly recognized that the suspect is *not* the true culprit (negative predictive value) (see Chapter 5).

ALTERNATIVE ANALYSIS TO CONFIDENCE-BASED ROC FOR COMPARING PROCEDURES

As noted in Chapter 5, the diagnosticity ratio [hit rate/false alarm rate = *HR/FAR* = sensitivity/(1 – specificity)] can depend not only on an eyewitness' tendency toward "conservative" or "liberal" identification (as measured by expressed confidence level), but also on numerous other factors, including: (1) lineup procedure (e.g., two levels: simultaneous versus sequential); (2) presence or absence of a weapon (two levels; more levels could be considered, such as gun, knife, towel, none); (3) stress (e.g., three levels: high, medium, low); (4) elapsed time between incident and exam (e.g., three levels: 30 min, 2 hours, 1 day); (5) race difference (e.g., two levels: same or different race or four levels: eyewitness/culprit = white/white; white/non-white; non-white/white; non-white/non-white; non-white/white); (6) participant (e.g., *N* levels, corresponding to *N* participants).

If a study is sufficiently large, one could develop a performance metric for each participant in the study corresponding to each of these conditions. For example, one could construct a ROC curve and calculate as the performance metric the logarithm of the area under the curve, or log(*AUC*), for each person and each condition in the study. One could also use as a performance metric the logarithm of the odds (log odds) of a correct decision; e.g., log(*HR*/(1-*HR*)) or log((1-*FAR*)/*FAR*).

Consider the following approach:

Let $y_{ijklmnr}$ denote the log(*AUC*) or a log odds (or another performance metric) for the r^{th} trial using participant n (n = 1, ...,*N*) for procedure i, weapon level j, stress level k, time condition l, and cross-race effect m.[17] One could write:

$$y_{ijklmnr} = \mu + \alpha_i + \beta_j + \gamma_k + \delta_l + \phi_m + (\alpha\beta)_{ij} + ...(interactions)... + \varepsilon_{ijklmnr}$$

[17]When the performance metric is a log odds, this model is known as logistic regression; see, e.g., F. Harrell, *Regression Modeling Strategies* (New York: Springer-Verlag, 2001). A model where the performance metric is log(*AUC*) was studied by F. Wang and C. Gatsonis. See F. Wang and C. Gatsonis, "Hierarchical Models for ROC Curve Summary Measures: Design and Analysis of Multi-Reader, Multi-Modality Studies of Medical Tests," *Statistics in Medicine* 27: 243-256 (2008).

where μ represents the overall average log(AUC) or log odds across all conditions, the next six terms reflect the main effects of A (lineup procedure: $i = 1$ for sequential and $i = 2$ for simultaneous); B (weapon: $j = 1$ for presence and $j = 2$ for absence of weapon); C (stress level: $k = 1$ for low, $k = 2$ for medium, $k = 3$ for high); D (elapsed time between incident and report: $\ell = 1$ for 30 minutes, $\ell = 2$ for 2 hours, $\ell = 3$ for 1 day); E (cross-race effect: $m = 1$ for same race and $m = 2$ for different races); F (participant effect: $n = 1, 2, \ldots, N$ participants); "(*interactions*)" reflects the joint effect of two or more factors together; and the last term, $\varepsilon_{ijklmnr}$ represents any random error in the r^{th} trial that is not specified from the previous terms (e.g., measurement, "ECL," multiple trials). This approach would allow one to separate the effects of the different factors, to assess which factors have the greatest influence on the outcome (here, logarithm of the area under the ROC curve: bigger is better), and to evaluate the importance of these factors relative to variation among "eyewitnesses." It may be that eyewitnesses are the greatest source of variability, dominating the effects of all other factors. Or it may be that, in spite of person-to-person variability, one or more factors still stand out as having strong influence on the outcome. Note that (1) other covariates could be included, such as age and gender of participant; and (2) the ROC curve need not be defined in terms of expressed confidence level thresholds if a more sensitive measure of response bias (tendency toward "liberal" versus "conservative" identifications) can be developed.

For example, C. A. Carlson and M. A. Carlson[18] use *partial area under the curve*, or *pAUC*, as a summary measure of the information in an ROC curve (bigger is better), for each of twelve different conditions defined by three factors: (1) Procedure, three levels: simultaneous (SIM: suspect in position 4), sequential (SEQ2: suspect in position 2), sequential (SEQ5: suspect in position 5); (2) Weapon focus, two levels: present versus absent; (3) Distinctive feature, two levels: present versus absent. The data are provided in their Table 3, along with 95% confidence intervals.[19] Because the length of a confidence interval is proportional to the standard error, *pAUC* values with shorter confidence intervals correspond to smaller standard errors and hence should have higher weights. The logarithms of the reported *pAUC* values and weights (reciprocals of the lengths of the reported confidence intervals) are given below in Table C-1.

For the Carlson study, the data on all $N = 2{,}675$ participants (720 undergraduates and 1,955 SurveyMonkey respondents) were combined, and

[18]C. A. Carlson and M. A. Carlson, "An Evaluation of Lineup Presentation, Weapon Presence, and a Distinctive Feature Using ROC Analysis," *Journal of Applied Research in Memory and Cognition* 3(2): 45–53 (2014).

[19]Ibid., p. 49.

TABLE C-1 Conditions and Logarithms of Reported *pAUC* Values[a]

Condition	Procedure	Weapon	Feature	$5 + \log(pAUC)$	Weight
1	SIM	Yes	Yes	1.31112	47.6
2	SIM	Yes	No	1.72983	33.3
3	SIM	No	Yes	0.92546	55.6
4	SIM	No	No	1.87643	45.5
5	SEQ2	Yes	Yes	1.49344	47.6
6	SEQ2	Yes	No	1.22774	47.6
7	SEQ2	No	Yes	1.08798	52.6
8	SEQ2	No	No	1.58875	41.7
9	SEQ5	Yes	Yes	1.70316	38.5
10	SEQ5	Yes	No	0.98262	58.8
11	SEQ5	No	Yes	0.65719	66.7
12	SEQ5	No	No	1.49344	55.6

[a]Adapted from data on *pAUC* from Table 3 in C. A. Carlson and M. A. Carlson. "An Evaluation of Lineup Presentation, Weapon Presence, and a Distinctive Feature Using ROC Analysis," *Journal of Applied Research in Memory and Cognition* 3(2): 45–53 (2014). The addition of "5" to log(*pAUC*) is simply to avoid negative numbers; the inferences from the analysis remain unchanged. Courtesy of Karen Kafadar.

expressed confidence levels were solicited on a 7-point scale. Variations in the twelve log(*pAUC*) values can be decomposed into three main effects (one each for procedure, weapon, and feature), and their two-way interactions. (The raw data may permit a more detailed analysis.) The data can be analyzed using a less complex model than that stated above (because the model has fewer terms):

$$y_{ijk} = \mu + \alpha_i + \beta_j + \gamma_k + (\alpha\beta)_{ij} + (\alpha\gamma)_{ik} + (\beta\gamma)_{jk} + \varepsilon_{ijk}$$

where y_{ijk} denotes (5 + log(*pAUC*)) for procedure i (i = 1, 2, 3), weapon condition j (j = 1, 2), and feature k (k = 1, 2); μ represents the overall average log(*pAUC*) across all conditions; α_i represents the effect of procedure i; βj represents the effect of weapon condition j; γ_k represents the effect of feature condition k; and the next three terms reflect the three two-factor interactions between the main factors. The analysis of variance, where log(*pAUC*) values are weighted according to the values in the last column of Table C-1, is given in Table C-2 below. None of the factors is significant.[20] It must be stressed that the complete set of raw data may yield a more powerful analysis with different results, as might a different summary measure of the ROC curve, such as *AUC*, or area under the ROC curve.[21]

[20]We can decompose the two degrees of freedom in the sum of squares for *Procedure* (three levels), 8.04, into two single degree of freedom contrasts, *SEQ2* versus *SEQ5* (4.14), and *sim* versus the average of *SEQ2* and *SEQ5* (3.90), and consider all pairwise interaction terms among the four "main effects." All single degree-of-freedom effects remain non-significant, in either this weighted analysis or in an unweighted analysis.

[21]For a discussion of the advantages and disadvantages of using *AUC* versus *pAUC* as a summary measure, see S. D. Walter, "The Partial Area Under the Summary ROC Curve," *Statistics in Medicine* 24(13): 2025–2040 (July 2005).

TABLE C-2 Analysis of Variance Table for log(*pAUC*)[a]

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F-statistic	p-value
Procedure	2	8.04	4.02	1.129	0.470
Weapon	1	2.94	2.94	0.826	0.460
Feature	1	14.72	14.72	4.138	0.179
Procedure×Weapon	2	0.59	0.30	0.083	0.923
Procedure×Feature	2	10.41	5.21	1.463	0.406
Weapon×Feature	1	34.80	34.80	9.780	0.089
Residuals	2	7.12	3.56		

[a]Adapted from data on *pAUC* from Table 3 in C. A. Carlson and M. A. Carlson. "An Evaluation of Lineup Presentation, Weapon Presence, and a Distinctive Feature Using ROC Analysis," *Journal of Applied Research in Memory and Cognition* 3(2): 45–53 (2014). Courtesy of Karen Kafadar.

THE STATE OF SOUTH CAROLINA)	IN THE COURT OF COMMON PLEAS
)	
COUNTY OF **RICHLAND**)	**FIFTH** JUDICIAL CIRCUIT
)	
Chris A. Liverman,)	Case No.: **2012CP4004870**
Applicant)	
)	
v.)	**MEMORANDUM IN SUPPORT OF POST-CONVICTION RELIEF**
)	
State of South Carolina,)	
Respondent.)	
)	

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RICHLAND COUNTY, S.C.

TO: The Honorable R. Scott Sprouse
Deputy Attorney General Ed Salter
Assistant Attorney General Lindsey McCallister

The Applicant, by and through the undersigned Counsel, submits this memorandum in support of Applicant's application for Post-Conviction Relief (PCR), and the testimony presented during the evidentiary hearing on December 17, 2018. *See Strickland v. Washington*, 466 U.S. 668 (1984); U.S. Const. amends. V, VI, XIV; S.C. Const. art. I, §§ 3 and 14; *See* S.C. Code § 17-27-20(A)(1), (4), and (6).

Procedural History

On August 27, 2004, the City of Columbia arrested Chris Liverman (Applicant) for two counts of murder. Applicant remained incarcerated until he proceeded to trial before the Honorable James W. Johnson, Jr. and a jury on November 6, 2006. The jury found Applicant guilty as charged. Judge Johnson sentenced Applicant to two consecutive life sentences on November 9, 2006.

On December 4, 2009, the Court of Appeals affirmed Applicant's convictions and sentences. *State v. Liverman*, 386 S.C. 223, 687 S.E.2d 70 (Ct. App. 2009). Our Supreme Court affirmed in result on June 6, 2012. *State v. Liverman*, 398 S.C. 130, 727 S.E.2d 422 (2012).

On July 17, 2012, Applicant filed an application for PCR. The South Carolina Attorney General's Office filed a Return to the PCR application on October 18, 2012. Applicant ultimately filed three Amended PCR applications: March 6, 2013; August 7, 2018; and December 11, 2018. In his final PCR application, Applicant raised the following allegations of ineffective assistance of counsel:

Allegations of Ineffective Assistance of Trial Counsel

(A) Trial Counsel denied Applicant's right to effective assistance of counsel as guaranteed by the Sixth and Fourteenth Amendments to the United States Constitution and Article I, Sections 3 and 14 of the South Carolina Constitution. *See* S.C. Code § 17-27-20(A)(1), (4), and (6). Trial Counsel's unreasonably deficient performance prejudiced Applicant because there is a reasonable probability that, but for Trial Counsel's errors, the result of the proceeding would have been different. *See Strickland v. Washington*, 466 U.S. 668 (1984). Specifically, Trial Counsel's acts or omissions included, but not are not limited to the following allegations:

(1) Trial Counsel failed to conduct a reasonable investigation and to develop all available, relevant, and admissible mitigating evidence in preparation for trial. *See Wiggins v. Smith*, 539 U.S. 510 (2003). Specifically, Trial Counsel failed to consult with an expert witness for an independent review of the eye-witness identification evidence implicating Applicant as the murderer when it was reasonable and necessary. *See Reeves v. State*, 415 S.C. 366, 782 S.E.2d 747 (Ct. App. 2015).

(2) Trial Counsel improperly argued irrelevant and highly prejudicial character evidence during the Applicant's opening statement by telling the jurors that Applicant had been incarcerated for twenty-six months prior to his jury trial.

(3) Trial Counsel failed to move for suppression of objectively false evidence that Applicant stole the gun that was used in the murders, resulting in Trial Counsel having to introduce otherwise inadmissible, irrelevant, and highly prejudicial character evidence that Applicant was incarcerated when the gun was used during the homicide was stolen.

(4) Trial Counsel failed to object to improper and highly prejudicial testimony by witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family.

(5) Trial Counsel failed to object to the admissibility of any testimony, by either lay or expert witnesses, that Applicant was a member of a gang, when such evidence was not relevant to the State's case and was inadmissible, unduly prejudicial character evidence.

(6) Trial Counsel failed to object to the admissibility of the State's gang expert witness testimony. *See State v. Jones*, 273 S.C. 723, 259 S.E.2d 120 (1979); *State v Council*, 335 S.C.1, 515 S.E.2d 508 (1999); *State v. White*, 382 S.C. 265, 273, 676 S.E.2d 684, 688 (2009) and Rules 702 and 703, SCRE.

(7) Trial Counsel failed to preserve for appellate review objections to highly prejudicial testimony of the State's gang expert witnesses, including but not limited to testimony about possible meanings of the teardrop tattoos and hash mark tattoos.

(8) Trial Counsel improperly called an expert witness to testify about gangs, including the possible meaning of tattoos, when it only served to bolster the credibility of the State's gang expert witnesses and enhance the State's improper and highly prejudicial evidence.

(9) Trial Counsel failed to object to the Solicitor's improper comments during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Specifically, Trial Counsel failed to object when

the prosecutor argued in closing, "There is not a single witness, or any evidence in this case, that points to anyone other than [Applicant] as being the shooter, the murderer." This unduly prejudicial argument was both burden shifting and an impermissible comment on Applicant's right not to testify.

(10) Trial Counsel failed to present all reasonable and necessary evidence to the judge during the sentencing phase in mitigation of Applicant's potential sentence.

(11) Trial Counsel failed to call an expert witness to testify in rebuttal of the eye-witness identification evidence presented by the State at trial when it was reasonable and necessary to present this critical evidence.

(12) Trial Counsel failed to properly object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors. *See* Rules 403 and 702, SCRE; *see also* United States *v. Santiago*, 643 F.3d 1007, 1011 (7th Cir. 2011) (juries are "likely to associate gangs with criminal activity and deviant behavior, such that the admission of gang evidence raises the specter of guilt by association or a verdict influenced by emotion." (internal quotation marks omitted)); *Cf. United States v. Archuleta*, 737 F.3d 1287, 1295 (10th Cir. 2013), cert. denied, 134 S. Ct. 2859 (2014) ("Any unfairness from gang-affiliation testimony stems from the implicit connection [drawn] between the crimes committed by gangs and the defendant gang member. In most cases, concern about such innuendo would be proper, because ordinarily the jury should not assume that the defendant gang member committed the [gang's] crimes.").

(13) Trial Counsel failed to object to improper and highly prejudicial testimony by a State's witness that he was scared to testify but was testifying for the victims and their

family.

Allegations of Ineffective Assistance of Appellate Counsel

(B) Appellate Counsel denied Applicant's right to effective assistance of counsel as guaranteed by the Sixth and Fourteenth Amendments to the United States Constitution and Article I, Sections 3 and 14 of the South Carolina Constitution. Appellate Counsel's unreasonably deficient performance prejudiced Applicant because there is a reasonable probability that, but for Appellate Counsel's errors, the result of the proceeding would have been different. *See Strickland*, 466 U.S. 668. Specifically, Appellate Counsel's acts or omissions included, but not are not limited to the following allegations:

(1) Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the testimony of the State's gang expert witnesses was entirely inadmissible.

(2) Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of teardrop tattoos was inadmissible.

(3) Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinions about the possible meaning of hash marks tattoos was preserved for appellate review.

(4) Appellate Counsel failed to appeal the portion of the S.C. Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

PCR Evidentiary Hearing

On December 17, 2018, Applicant appeared before the Honorable R. Scott Sprouse for an evidentiary hearing on the allegations of ineffective assistance of counsel.

Attorneys Dayne Phillips and Charles Grose represented Applicant, and Assistant Attorney General Lindsey McCallister and Deputy Attorney General Ed Salter represented the State. Dawn McQuiston, Ph.D. and Trial Counsel Elizabeth Franklin-Best testified at the evidentiary hearing.

Prior to testimony, the undersigned Counsel verbally added allegations of ineffective assistance of counsel based on Trial Counsel's failure to object during the State's closing argument. Specifically, the undersigned Counsel noted that Trial Counsel failed to object to the State's vouching and bolstering of two witnesses, Shante Bethel and Diego Thompson, and that the State presented improper Golden Rule and burden shifting arguments during its closing arguments.

Dawn McQuiston, Ph.D., testified that she is a psychology professor at Wofford College. She provided her educational background in psychology and her research on eye-witness memory. She also testified that she is a member of several psychological organizations and that her research has been published and peer-reviewed. Professor McQuiston further noted that she had been previously qualified numerous times as an expert witness in South Carolina.

The PCR Court subsequently qualified Dawn McQuiston as an expert witness in eye-witness identification and eye-witness memory. Over the State's objection, the PCR Court also admitted numerous articles and reports containing research data on eye-witness identification and memory into evidence. Ms. McQuiston testified that the authors of those articles and reports were considered experts in her field and contained accurate research data.

Professor McQuiston testified as to how memory works and how memories are stored in the human brain. Specifically, she testified that there are three types of memory: sensory; short-term; and long-term. She also testified regarding "attention" and "perception", and how each of these affects a person's memory. She further testified about how familiarity with a specific person can sometimes lead to a misidentification because it increases the person's confidence in the identification.

Professor McQuiston then testified about the research on a person's confidence and accuracy when making an identification. She noted that, based on empirical research, eye-witness confidence is not a strong predictor of the identification's accuracy. Notably, Professor McQuiston testified that a one-on-one identification procedure (also known as a "showup") where a person is shown a single picture of a person is suggestive, unlike the preferred method of using a lineup identification procedure.

Professor McQuiston testified that there is empirical research examining how the one-on-one procedure compares to a lineup procedure. She further testified the research indicates that there is a higher risk that people make false identifications when a one-on-one procedure is used compared to a lineup procedure. She also testified that the U.S. Department of Justice published guidelines discussing the administration of identification procedures in 1999.

Furthermore, Professor McQuiston testified that the National Academy of Sciences (NAS) released a comprehensive report endorsing the best practices for identification procedure. Notably, the NAS guidelines state that the use of a one-on-one identification procedure is inherently a suggestive procedure and that in-court identifications can be influenced by a prior suggestive identification.

Professor McQuiston testified she had reviewed portions of the Applicant's trial transcript (the testimony of Tyrone Smith and Investigator Joe Gray) and answered the undersigned Counsel's questions regarding relevant factors that could have affected Applicant's memory (eye-witness identification) such as the inherently suggestive one-on-one identification procedure. Based on her training and experience as an expert witness, Professor McQuiston testified that expert testimony on eye-witness identification and memory would have been helpful to the jury in Applicant's trial because it would have educated the jury on those issues and would have put the jury in a better position to make a determination based on eye-witness identification and memory testimony. Professor McQuiston also testified regarding the Innocence Project's research on eye-witness misidentification.

Trial Counsel, Elizabeth Franklin-Best, testified about the Prosecutor's reference to a stolen gun during the State's opening statement, and the Defense's decision to inform the jury of Applicant's prior incarceration to prove Applicant could not have stolen the gun. Trial Counsel also testified that this was her first murder trial and that she had limited experienced with using expert witnesses. Trial Counsel noted that Applicant tested negative for Gunshot Residue (GSR) and that Applicant's statement to law enforcement was materially different from provable facts based on the evidence.

Trial Counsel testified regarding the existence of implausible statements by witnesses and inconsistences in the State's theory based on the evidence. Trial Counsel noted the defense theory was that Diego Thompson was the shooter because he was present at the shooting and had a motive to lie at Applicant's trial. Trial Counsel admitted that she did not consult with an eye-witness identification expert and agreed the identified

was flawed. Notably, Trial Counsel also admitted that her failure to consult with an eye-witness identification expert was not a strategic decision.

Trial Counsel testified regarding the State's presentation of gang evidence, gang membership, gang tattoos/hashmarks, and expert testimony regarding gang membership and activity. Trial Counsel also testified about the *State v. Council*, 335 S.C. 1, 515 S.E.2d 508 (1999) hearing to determine the reliability of unscientific evidence and acknowledged that the subsequent appellate opinion in *State v. White*, 382 S.C. 265, 676 S.E.2d 684 (2009). Trial Counsel further testified regarding her failure to object during the State's closing argument. Specifically, her failure to object to improper vouching/bolstering of the State's witnesses, improper references to Applicant's tattoos, Solicitor's references about the danger to the community, and Golden Rule arguments.

After hearing testimony, the PCR Court granted Applicant's request to submit "briefs" (this memoranda) instead of immediately presenting arguments in support of the allegations of ineffective assistance of counsel.

STANDARD OF REVIEW

The Sixth Amendment to the United States Constitution guarantees a defendant the right to effective assistance of counsel. U.S. Const. amend. VI. To establish ineffective assistance of counsel, an applicant must satisfy the two-prong test set forth in *Strickland v. Washington*, 466 U.S. 668 (1984) (establishing the standard for ineffective assistance of counsel claims). "First, a [applicant] must show that counsel's performance was deficient. Under this prong, [t]he proper measure of attorney performance remains simply reasonableness under prevailing professional norms." *Cherry v. State*, 300 S.C. 115, 386 S.E.2d 624 (1989) (internal citations omitted). "The second prong of the *Strickland* test

requires a showing that the deficient performance prejudiced the defendant to the extent that there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different." *Id.* at 118, 386 S.E.2d at 625 (internal citations omitted). Therefore, an applicant must prove that "counsel's conduct so undermined the proper functioning of the adversarial process that the trial cannot be relied upon as having produced a just result" when seeking relief based on ineffective assistance of counsel. *Butler v. State*, 286 S.C. 441, 442, 334 S.E.2d 813, 814 (1985) (quoting *Strickland*, 466 U.S. at 692).

Due process also requires a defendant receive effective assistance of counsel on direct appeal. *Evitts v. Lucey*, 469 U.S. 387, 396 (1985). Effectiveness of appellate counsel is judged under the *Strickland* standard. *See Smith v. Robbins*, 528 U.S. 259 (2000). Notably, appellate counsel is ineffective for failing to raise a meritorious issue entitling an appellant to relief. *See Southerland v. State*, 337 S.C. 610, 524 S.E.2d 833 (1999); *Patrick v. State*, 349 S.C. 203, 562 S.E.2d 609 (2002).

In a PCR action, "[t]he burden of proof is on the applicant to prove his allegations by a ***preponderance of the evidence***." *Frasier v. State*, 351 S.C. 385, 389, 570 S.E.2d 172, 174 (2002) (citing Rule 71.1(e), SCRCP) (emphasis added). Strategic "[d]ecisions made [by counsel] in ignorance of relevant, available information cannot be characterized as strategic." *Weik v. State*, 409 S.C. 214, 236, 761 S.E.2d 757, 768 (2014). "Ordinarily, the existence of 'overwhelming evidence' does not automatically preclude a finding of prejudice." *Smalls v. State*, 422 S.C. 174, 189, 810 S.E.2d 836, 844 (2018). Notably, "for the evidence to be 'overwhelming' such that it categorically precludes a finding of prejudice . . . the evidence must include something conclusive,

such as a confession, DNA evidence demonstrating guilt, or a combination of physical and corroborating evidence so strong that the *Strickland* standard of 'a reasonable probability . . . the factfinder would have had a reasonable doubt' cannot possibly be met." *Id.* 422 S.C. at 191, 810 S.E.2d at 845.

ARGUMENT

Trial and Appellate Counsel denied Applicant's right to effective assistance of counsel as guaranteed by the Sixth and Fourteenth Amendments to the United States Constitution and Article I, Sections 3 and 14 of the South Carolina Constitution.

In this case, Trial Counsel's and Appellate Counsel's performance were deficient, as both fell below an objective standard of reasonableness "under prevailing professional norms." *See Strickland*, 466 U.S. at 687-88; *Cherry*, 300 S.C. 115, 386 S.E.2d 624; *see also* S.C. Code § 17-27-20(A)(1), (4), and (6). Their deficient performance prejudiced Applicant because it "so undermined the proper functioning of the adversarial process that the trial cannot be relied upon as having produced a just result." *Butler*, 286 S.C. at 442, 334 S.E.2d at 814 (quoting *Strickland*, 466 U.S. at 692). Therefore, the PCR court erred in finding trial counsel provided effective assistance of counsel because "there is a reasonable probability that, but for [trial] counsel's unprofessional errors, the result of the proceeding would have been different." *Cherry*, 300 S.C. at 118, 386 S.E.2d at 625 (internal citations omitted).

I. Trial Counsel failed to conduct a reasonable investigation and failed to develop all available, relevant, and admissible mitigating evidence in preparation for Applicant's trial.

The Supreme Court of the United States has held that "counsel has a duty to make reasonable investigations or to make a reasonable decision that makes particular investigations unnecessary." *Strickland*, 466 U.S. at 691; *See Wiggins v. Smith*, 539 U.S.

510, 527 (2003). Notably, our Supreme Court held that "[a] criminal defense attorney has the duty to conduct a reasonable investigation to discover all reasonably available mitigation evidence and all reasonably available evidence tending to rebut any aggravating evidence introduced by the State." *McKnight v. State*, 378 S.C. 33, 46, 661 S.E.2d 354, 360 (2008); *see also Ard v. Catoe*, 372 S.C. 318, 642 S.E.2d 590 (2007) ("Without a doubt, [a] criminal defense attorney has a duty to investigate, but this duty is limited to reasonable investigation.") (internal quotation omitted)).

Furthermore, "while the scope of a reasonable investigation depends on a number of issues, at a minimum, counsel has the duty to interview potential witnesses and to make an independent investigation of the facts and circumstances of the case." *Lounds v. State*, 380 S.C. 454, 460, 670 S.C. 646, 649 (2008) (quoting *Ard*, 372 S.C. at 331-32, 642 S.E.2d at 597). The duty to conduct a reasonable investigation extends to consulting and possibly presenting expert witnesses. *See McKnight*, 378 S.C. at 46, 661 S.E.2d at 360-61; *see also Von Dohlen v. State*, 360 S.C. 598, 607, 602 S.E.2d 738, 743 (2004) ("Petitioner has demonstrated his attorneys erred in failing to adequately investigate and prepare expert testimony about his mental condition as it existed at the time of the murder."). Therefore, "[i]n assessing the reasonableness of an attorney's investigation, . . . a court must not only consider the quantum of evidence already known to counsel, but also whether the known evidence would lead a reasonable attorney to investigate further." *Wiggins*, 539 U.S. at 527.

Discussion

In this case, Trial Counsel failed to consult with an expert witness for an independent review of the eye-witness identification evidence implicating Applicant as the

murderer when it was reasonable and necessary given the critical importance of Tyrone Smith's testimony (i.e., his identification of Applicant). *See Strickland*, 466 U.S. at 691; *See Wiggins*, 539 U.S. at 527; *Von Dohlen*, 360 S.C. at 607, 602 S.E.2d at 743. Trial Counsel testified that her failure to consult with this type of expert witness was not a strategic decision. *See McKnight*, 378 S.C. at 46, 661 S.E.2d at 360 (finding "[a] criminal defense attorney has the duty to conduct a reasonable investigation to discover all reasonably available mitigation evidence and all reasonably available evidence tending to rebut any aggravating evidence introduced by the State.").

II. Trial Counsel failed to call an expert witness to testify in rebuttal of the eye-witness identification evidence presented by the State at trial when it was reasonable and necessary to present this critical evidence in Applicant's defense.

In *Lounds v. State*, 380 S.C. 454, 462, 670 S.E.2d 646, 650 (2008), our Supreme Court found that it "was not objectively reasonable given the defense theory of the case" for trial counsel not to call witnesses who would have "added significantly to the credibility of petitioner's case". *See Hicks v. State*, 314 S.C. 280, 443 S.E.2d 907 (1994) (finding ineffective assistance of counsel when there is a reasonable probability the result would have been different had trial counsel introduced relevant and favorable evidence at trial); *But cf. Stokes v. State*, 308 S.C. 546, 419 S.E.2d 778 (1992) (finding trial counsel's decision not to call witnesses reasonable where their testimony would have been of no value to the case and had made inconsistent statements in the past).

Discussion

In this case, Trial Counsel's decision not to call an expert witness in eye-witness identification and memory "was not objectively reasonable given the defense theory of the case" because expert testimony would have "added significantly to the credibility of

petitioner's case". *See Lounds*, 380 S.C. at 462, 670 S.E.2d at 650 (finding that it "was not objectively reasonable given the defense theory of the case" for counsel not to call witnesses that were critical to his client's defense). This argument is supported by Professor Dawn McQuiston's testimony at the evidentiary hearing that the jury would have been in a better position to judge the identification evidence if educated on the research data by an expert witness. *See McKnight*, 378 S.C. at 46, 661 S.E.2d at 360 (finding that counsel was ineffective in a homicide by child abuse case for: (1) calling an expert witness that undermined the defense; (2) failing to call an expert witness that supported the defense theory; and (3) in failing to challenge the State's evidence.).

III. Trial Counsel improperly argued irrelevant and highly prejudicial character evidence during the Applicant's opening statement by telling the jurors that Applicant had been incarcerated for twenty-six months prior to his jury trial.

Our Supreme Court has found that "evidence introduced for the sole purpose of implying a defendant has a prior criminal record is improper." *Geter v. State*, 305 S.C. 365, 367, 409 S.E.2d 344, 345 (1991) (citing *State v. Tate*, 288 S.C. 104, 341 S.E.2d 380 (1986)). *See also Deck v. Missouri*, 544 U.S. 622 (2005); *Estelle v. Williams*, 425 U.S. 501 (1976). In *Roseboro v. State*, 317 S.C. 292, 294, 454 S.E.2d 312, 313 (1995), our Supreme Court held that "counsel must articulate a valid reason for employing a certain strategy to avoid a finding of ineffectiveness, and where counsel articulates a strategy, it is measured under an objective standard of reasonableness". *See Stacy v. Solem*, 801 F.2d 1048, 1051 (8th Cir. 1986) (finding that "labeling counsel's actions as "trial strategy" does not automatically immunize an attorney's performance from sixth amendment challenges.").

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Discussion

In this case, during a pre-trial hearing, Trial Counsel moved for a continuance based on pre-trial publicity, including an article the prior day in *The State Newspaper* about gangs. The article "included a mug short of Christopher Liverman," which counsel reminded "would be clearly inadmissible at trial." The article discussed Mr. Liverman's trial, alleged he was a member of a gang, and implicated him in other unsolved murders. The articles appeared on thestate.com and linked to an article setting forth Mr. Liverman's criminal history. Trial counsel argued the publication of this article denied Mr. Liverman "due process" and interfered with his "right to a fair trial." Tr. (8/28/2006) at 12-15.

During opening statements, trial counsel informed the jurors:

> Christopher Liverman was arrested in 18 minutes, and he has been under arrest ever since. For the last 26 months he has been under arrest, and for the last 26 months the State has had the opportunity to build a case against him, so that's 26 months he has been in jail.

Tr. 117. These remarks implied Mr. Liverman's guilt and was improper character evidence in violation of Rule 404(a), SCRE. "[E]vidence introduced for the sole purpose of implying a defendant has a prior criminal record is improper." *Geter v. State*, 305 S.C. 365, 367, 409 S.E.2d 344, 345 (1991) (citing *State v. Tate,* 288 S.C. 104, 341 S.E.2d 380 (1986)). *See also Deck v. Missouri*, 544 U.S. 622 (2005); *Estelle v. Williams*, 425 U.S. 501 (1976).

IV. Trial Counsel failed to move for suppression of objectively false evidence that Applicant stole the gun that was used in the murders, resulting in Trial Counsel having to introduce otherwise inadmissible, irrelevant, and highly prejudicial character evidence that Applicant was incarcerated when the gun was used during the homicide was stolen.

The *Roseboro* Court held that "counsel must articulate a valid reason for employing a certain strategy to avoid a finding of ineffectiveness, and where counsel articulates a

strategy, it is measured under an objective standard of reasonableness". *Roseboro*, 317 S.C. at 294, 454 S.E.2d at 313; *See Solem*, 801 F.2d at 1051 (finding that "labeling counsel's actions as "trial strategy" does not automatically immunize an attorney's performance from sixth amendment challenges."); *Sikes v. State*, 323 S.C. 28, 32, 448 S.E.2d 560, 563 (1994) ("Because counsel's failure to motion to suppress evidence was based on the fact that he thought the officers' action were justified, we find counsel's decision fell below an objective standard of reasonableness"); *see also Martin v. Maxey*, 98 F.3d 844 (5th Cir. 1996) (Failure to file a motion to suppress could be grounds for ineffectiveness claim).

Discussion

In this case, on October 2, 2004, Officer Robin Dutton, while working on another case, located in a creek bed the firearm that was used in these two murders. An N.C.I.C. check revealed the firearm had been reported stolen in June 2004, prior to these murders. Tr. 708-30. During the testimony of Joe Gray, the lead investigator in this case, the Solicitor elicited the following testimony:

> Q: Regarding the trace of the rifle, in your experience in investigating criminal cases all these years, is it – how often is it that crimes involving weapons that are committed are done with a weapon that's registered to the person that commits the offense?
>
> A: Very rarely.
>
> Q: Okay. And when they asked you would you please do the gun trace, you did it?
>
> A: Yes.
>
> Q: And lo and behold the result of the investigation was what?
>
> A: The was stolen during an auto breaking.

Q: And you contacted the victim o the auto breaking?

A: Yes, I did.

Q: You let him know, "We recovered your weapon, but you're not getting it back"?

A: Yes.

Q: It's now a piece of a criminal investigation?

A: Ma'am?

Q: It's now a piece of evidence –

A: Yes, ma'am.

Q: – in a criminal investigation?

She asked you if you had any leads on who stole that weapon. In fact, you did have one lead in your investigation, didn't you?

A: Well, there was I think a pair of sunglasses left in the car at the time.

Q: Okay. Did Diego give a statement about where the defendant got this weapon?
A: Yes, he did.

Q: Okay. And Diego told you that the defendant dis he stole it a few months before.

A: He said he had stolen the gun, yes.

Tr. 650-52.

The Solicitor's argument that Christopher Liverman stole the gun is objectively false, which trial counsel demonstrated when they called Officer Tylisa L. Edmonds of the Columbia Police Department and Captain William M. bowman of the Alvin S. Glenn Detention Center. Officer Edmonds testified about responding to the automobile breaking on June 24, 2004 where the murder weapon was reported stolen. Tr. 1095-99. Captain Bowman testified that Mr. Liverman was incarcerated from June 2-28, 2004. Tr. 1135-36.

Thus, in order to prove false Diego Thompson's allegation that Mr. Liverman stole the murder weapon, trial counsel had to call witnesses to prove Mr. Liverman was incarcerated on an unrelated charge on the day the firearm was stolen. This testimony infomred the jurors that Mr. Liverman, who did not testify at trial, had a prior criminal record. *See Deck, Estelle, Geter* and *Tate, supra.* The Solicitor had a due process obligation and ethical duty not to present false testimony. *Riddle v. Ozmint*, 369 S.C. 39, 631 S.E.2d 70 (2006) (State was obligated to correct co-defendant's false testimony at trial). *Riddle* was decided five months before Mr. Liverman's trial, and his trial counsel were deficient for not objecting to the presentation of the false testimony and moving the trial judge to require the solicitor to correct it. Therefore, Trial Counsel provided ineffective assistance of counsel for introducing this inadmissible evidence.

V. Trial Counsel failed to object to improper and highly prejudicial testimony by the State's witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family.

In *Mincey v. State*, 314 S.C. 355, 444 S.E.2d 510 (1994), our Supreme Court found trial counsel was ineffective for failing to object to solicitor's closing argument that petitioner had intimidated witnesses where there was no evidence of intimidation presented at trial. Our Supreme Court found trial counsel ineffective in a case involving multiple charges arising from a shooting incident due to counsel's failure to object to the admission of a handgun found in the defendant's apartment that had no relevance to the offenses for which the defendant was charged. *See Holman v. State*, 381 S.C. 491, 674 S.E.2d 171 (2009); Rules 401 and 403, SCRE. Our Supreme Court also found trial counsel's failure to object to a forensic interviewer's inadmissible testimony that a criminal sexual conduct victim's statement was "believable," and that the victim had no reason

"not to be truthful" was not a valid trial strategy where counsel failed to set forth a specific strategic reason for failing to object. *Smith v. State*, 386 S.C. 562, 689 S.E.2d 629 (2010); *see also Dawkins v. State*, 346 S.C. 151, 551 S.E.2d 260 (2001) (finding trial counsel's failure to object to prejudicial hearsay because he did not want to "confuse or upset the jury" was not valid strategy). *See Holman*, 381 S.C. 491, 674 S.E.2d 171; *Smith*, 386 S.C. 562, 689 S.E.2d 629; *see also Dawkins*, 346 S.C. 151, 551 S.E.2d 260.

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing to object to improper and highly prejudicial testimony by the State's witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family. *See Mincey*, 314 S.C. 355, 444 S.E.2d 510; *see also* Rules 401 and 403, SCRE.

VI. Trial Counsel failed to object to the admissibility of all testimony, by either lay or expert witnesses, that Applicant was a member of a gang, when such evidence was not relevant to the State's case and was inadmissible, unduly prejudicial character evidence.

In *Mitchell v. State*, 298 S.C. 186, 379 S.E.2d 123 (1989), our Supreme Court found trial counsel ineffective for failing to object to the inadmissible evidence of defendant's devil worship and mafia membership which tended to prove only that the defendant was a bad person with a propensity to commit crime. *See Smith*, 386 S.C. 562, 689 S.E.2d 629; *Dawkins*, 346 S.C. 151, 551 S.E.2d 260; *see also* Rules 401 and 403, SCRE.

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing to object to the admissibility of all testimony, by either lay or expert witnesses, that Applicant was a member of a gang, when such evidence was not relevant to the State's case and

was inadmissible, unduly prejudicial character evidence. *See Mitchell*, 298 S.C. 186, 379 S.E.2d 123; *see also* Rules 401 and 403, SCRE.

VII. Trial Counsel failed to object to the admissibility of the State's gang expert witness testimony.

Relying on *State v. Price*, 368 S.C. 494, 629 S.E.2d 363 (2006), the Solicitor announced during a pre-trial hearing that the State planned to rely on the testimony of a gang expert. The State acknowledged the testimony in *Price* was limited to a history of gang activity in Columbia, including clothing and hand signals. The State further acknowledged it was "improper" for the witness in *Price* "to testify based on hearsay that the defendant was a member of a gang." The State, however, announced its hope "to introduce evidence of the tattoos on [Mr. Liverman's] body that are indicative of" gang membership. The State's gang expert would "explain the pitchfork, the IGD which is tattooed on [Mr. Liverman's] hand that he is a member of the Insane Gangster Disciple which is a set of Folk Nation." The State claimed this evidence is part of the *res gestae* and tends to prove motive for the murders. Trial counsel pointed out that gang membership is not "an element of the crime" and reminded the Court about the pre-trial publicity about gangs. The trial judge ruled the testimony would be admissible under *State v. Price* and would not be excluded under Rule 403, SCRE. The State pressed further, telling the trial judge, "[W]e will be eliciting information regarding the tattoos. So at some point we would just want to cover those prior to opening statements." Tr. (8/28/2006) at 4-12.

The trail judge called for additional arguments about "the State wishing to require [Mr. Liverman] to demonstrate or expose tattoos." Although acknowledging displaying the tattoos would be "non-testimonial," trial counsel argued the State "must lay a

foundation before they can get these tattoos into evidence." Counsel argued the State should not be allowed to "attribute a specific meaning to the tattoo" and expressed concern that the prosecution 'want[ed] to enter this into evidence so that the jury will infer that it [represents] the death of these two children, but it is not what these two tattoos mean." Counsel argued "this sort of evidence is character assignation" and an attempt to "terrify the jury with this talk of hidden meanings and secret meanings of gang members," which is "grossly and unduly prejudicial to [Mr. Liverman]." Counsel argued "allowing any evidence about tattoos" would be "back door character propensity evidence" that would deny Mr. Liverman a fair trial under the United States and South Carolina constitutions. Tr. (8/28/2006) 112-14.

The State continued to argue these tattoos have specific meaning but acknowledged this information came from interviewing gang members about the specific meanings of tattoos, which would be hearsay. Trial counsel called for "an in camera hearing on this specific question before we actually do this in front of the jury so that [the trial court] can make a determination of whether or not it is admissible." The trial judge agreed the court should convene a *Council* hearing. See *State v. Council*, 335 S.C. 1, 515 S.E.2d 508 (1999); *see also State v. White*, 382 S.C. 265, 273, 676 S.E.2d 684, 688 (2009); *State v. Jones*, 273 S.C. 723, 259 S.E.2d 120 (1979); and Rules 702 and 703, SCRE. Tr. 114-17. The trial court never convened a *Council* hearing.

When the trial resumed, the State called Edward O'Cain as an expert in gangs, subject to trial counsel's previous objections. He acknowledged his information came, in part, from interviews of inmates in the Department of Corrections and street investigations. Mr. O'Cain testified about the purported meanings of Mr. Liverman's

tattoos and "brands." Asking about the meanings of particular tattoos, the Solicitor asked about what a person has to do the get the "rank" of "set king strike two." Mr. O'Cain responded, "What I'm being told from the streets and interviews, to get the strike series of that rank, you have to have bodies attributed to you." Trial counsel objected and asked for a hearing outside the presense of the jurors. Counsel moved for a mistrial calling the testimony "a completely outrageous claim [with] absolutely no support at all." Trial counsel argued the information was hearsay that implicated the Confrontation clause. Cunsel cited *State v. Price,* 368 S.C. 494, 629 S.E.2d 363 (2006). The trial judge overruled the objection. Tr. 900-53. The State also called Officer Walter F. Mahoney of the Columbia Police department's Gang Task Force, subject to Mr. Liverman's "continuing objection," who provided testimony similar to Mr. O'Cain's testimony. Tr. 953-70.

Trial counsel was deficient for not insisting on a *Council* hearing to determine the admissibility of the State's gang expert testimony. The trial court judge had the gatekeeping obligation to determine whether the subject matter rose to the level of expert testimony, whether the expert had the requisite qualifications, and whether the testimony was reliable. *Watson v. Ford Motor Co.*, 389 S.C. 434, 699 S.E.2d 169 (2010). A *Council* hearing would have led to a proper application of *State v. Price*, 368 S.C. 494, 629 S.E.2d 363 (2006), and the most prejudicial portions of Mr. O'Cain's testimony would have been excluded. *See State v. Jones*, 273 S.C. 723, 259 S.E.2d 120 (1979); *State v Council,* 335 S.C.1, 515 S.E.2d 508 (1999); *State v. White*, 382 S.C. 265, 273, 676 S.E.2d 684, 688 (2009) and Rules 702 and 703, SCRE.

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VIII. Trial Counsel failed to preserve for appellate review objections to highly prejudicial testimony of the State's gang expert witnesses, including but not limited to testimony about possible meanings of the teardrop tattoos and hash mark tattoos.

"On appeal, [Mr. Liverman] contend[ed] the trial judge erred in allowing Investigator O'Cain to testify the hash marks on [his] back indicated he had bodies attributed to him, as this evidence placed his character at issue in violation of Rules 403 and 404(b), SCRE. *State v. Liverman*, 386 S.C. 223, 242, 687 S.E.2d 70, 79-80 (Ct. App. 2009), *aff'd but criticized State v. Liverman,* 398 S.C. 130, 727 S.E.2d 422 (2012). Specifically, Mr. Liverman argued "this testimony, in violation of Rule 404(b), 'referred to possible homicides prior to the two for which [appellant] was standing trial,' as the State had maintained the two teardrop tattoos symbolized the homicide of C.D. and T.M." *Id.* Mr. Liverman "further summarily argue[d] evidence appellant was involved in two prior murders is inadmissible under Rule 403, SCRE, as it is "unduly prejudicial and inflammatory." *Id.* The Court of Appeals ultimately held, "The precise argument appellant raises on appeal, that the hash mark testimony referred to prior homicides and thus violated Rules 403 and 404(b), was not raised to the trial judge and therefore is not preserved for review." *Id.* 386 S.C. at 242, 687 S.E.2d at 80.

Trial counsel was ineffective for not preserving this issue for appeal. *See Mitchell v. State*, 298 S.C. 186, 379 S.E.2d 123 (1989) (failure to object to improper character evidence was prejudicial ineffective assistance of counsel warranting a new trial).

IX. Trial Counsel improperly called an expert witness to testify about gangs, including the possible meaning of tattoos, when it only served to bolster the credibility of the State's gang expert witnesses and enhance the State's improper and highly prejudicial evidence.

Trial counsel called Robert C. Walker as a gang expert with the hopes of

establishing that the testimony of the state's gang experts was not reliable. Tr. 1163-1223. The result was emphasizing the most prejudicial portions of testimony by Mr. O'Cain and Officer Mahoney. Mr. Walker's testimony was unreliable and inadmissible under *Council* and *Jones*. To the extent that Mr. Walker had information relevant for the trial judge, counsel should have presented it during the Counsel hearing to assist the trial judge in exercising the court's gatekeeping role regarding the admissibility of unreliable testimony. *See Watson, supra*. Trial counsel, therefore, was in effective for not presenting this testimony during an *in camera Council* hearing. Trial counsel was additionally ineffective for presenting this unreliable testimony to the jurors. This testimony also emphasized the inadmissible bad character evidence. *See Mitchell, supra*.

X. Trial Counsel failed to object to the Solicitor's improper comments during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments.

During closing argument, "[a] solicitor has a right to state his version of the testimony and to comment on the weight to be given such testimony." *Randall v. State*, 356 S.C. 639, 642, 591 S.E.2d 608, 610 (2004). Yet, the "argument must not be calculated to arouse the jurors' passions or prejudices, and its content should stay within the record and reasonable inferences to it." *State v. Rudd*, 355 S.C. 543, 549, 586 S.E.2d 153, 156 (Ct. App. 2003) (citation omitted); *See State v. Copeland*, 321 S.C. 318, 324, 468 S.E.2d 620, 624 (1996) (finding a solicitor's closing argument must be carefully tailored so as not to appeal to the personal biases of the jury).

In *State v. Northcutt*, our Supreme Court explained the boundaries for prosecutors in closing arguments:

> Solicitors are bound to rules of fairness in their closing arguments ... While the solicitor should prosecute vigorously, his duty is not to convict a defendant but to see justice done. The solicitor's closing argument must, of course, be based on this principle. The argument therefore must be carefully tailored so as not to appeal to the personal bias of the juror nor be calculated to arouse his passion or prejudice.

State v. Northcutt, 372 S.C. 207, 222, 641 S.E.2d 873, 881 (2007) (internal citation and quotation omitted).

"The relevant question is whether the solicitor's comments so infected the trial with unfairness as to make the resulting conviction a denial of due process." *Humphries v. State*, 351 S.C. 362, 373, 570 S.E.2d 160, 166 (2002) (finding "[i]mproper comments do not automatically require reversal if they are not prejudicial to the defendant, and the appellant has the burden of proving he did not receive a fair trial because of the alleged improper argument."); *See State v. Hornsby*, 326 S.C. 121, 129, 484 S.E.2d 869, 873 (1997) ("A denial of due process occurs when a defendant in a criminal trial is denied the fundamental fairness essential to the concept of justice."); *Vaughn v. State*, 362 S.C. 163, 170, 607 S.E.2d 72, 75 (2004) (citing *Donnelly v. DeChristoforo,* 416 U.S. 637, 642, 94 S.Ct. 1868 (1974)).

Notably, when the solicitor has improperly commented on the accused's right to maintain silence, the prejudice prong is the same as the harmless error analysis on direct appeal. *See McFadden v. State*, 342 S.C. 637, 539 S.E.2d 391 (2000).

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing to object when the prosecutor argued in closing: (1) "There is not a single witness, or any evidence in this case, that points to anyone other than [Applicant] as being the shooter,

the murderer"; (2) "He sits there today bragging to you, to us, and to our community, that he did this"; (3) references to tattoos on Applicant's face; (4) juror's community, not gangs; (5) "My office, my job was to seek justice"; and (6) "We use the word truth". Tr. 1304, ll. 15-16; Tr. 1319, ll. 3-6; Tr. 1368 – 1374; Tr. 1392, l. 2 – 1393, l. 7. This unduly prejudicial argument was both burden shifting and an impermissible comment on Applicant's right not to testify. *See Humphries*, 351 S.C. at 373, 570 S.E.2d at 166; *McFadden*, 342 S.C. 637, 539 S.E.2d 391; *State v. Kennedy*, "272 S.C. 231, 250 S.E.2d 338 (1978) (finding curative instruction could not cure the prejudice to the defendant).

XI. Trial Counsel failed to object to the Solicitor's improper comments vouching/bolstering the credibility of the State's witnesses during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments.

The South Carolina Supreme Court has defined when a solicitor vouches for the credibility of a witness in *State v. Kelly*, 343 S.C. 350, 540 S.E.2d 851 (2001), *rev'd on other grounds*, *Kelly v. State*, 534 U.S. 246, 122 S.Ct. 726 (2002):

> Vouching constitutes an assurance by the prosecuting attorney of the credibility of a Government witness through personal knowledge or by other information outside of the testimony before the jury. . . . A prosecutor's vouching for the credibility of a government witness raises two concerns: (1) such comments can convey the impression that evidence is not presented to the jury but known to the prosecutor, supports the charges against the defendant and can thus jeopardize the defendant's right to be tried solely on the basis of the evidence presented to the jury; and (2) the prosecutor's opinion carries with it the imprimatur of the Government and may induce the jury to trust the Government's judgment rather than its own view of the evidence.

Id. at 368-69, 540 S.E.2d at 860 (quotation omitted). *See State v. Shuler,* 344 S.C. 604, 545 S.E.2d 805, *cert. denied,* 534 U.S. 977, 122 S.Ct. 404 (2001) ("[A] solicitor: cannot vouch for the credibility of a witness by expressing or implying his personal opinion

concerning a witness' truthfulness . . . . Improper vouching occurs when the prosecution places the government's prestige behind a witness by making explicit personal assurances of a witness' veracity, or where a prosecutor implicitly vouches for a witness' veracity by indicating information not presented to the jury supports the testimony[.]") (citations omitted). Therefore, "[b]ecause a jury must make its own assessment on the credibility of witnesses, it is inappropriate for the State to assure the jury of a government witness's credibility." *Gilchrist v. State*, 350 S.C. 221, 227, 565 S.E.2d 281, 285 (2002) (quoting *Kelly*, 343 S.C. at 369, 540 S.E.2d at 861).

In *Matthews v. State*, 350 S.C. 272, 565 S.E.2d 766 (2002), our Supreme Court found trial counsel's decision not to object to prosecutor's improper vouching for the credibility of the State's witnesses because counsel did not want the judge to scold him in front of the jury or give the prosecution more time to make their closing was not valid, even though the record reflected the judge did admonish counsel for wrongfully objecting during the closing and did grant additional time to compensate for the interruption

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing object to the Solicitor's improper comments vouching/bolstering the credibility of the State's witnesses during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Tr. 1315; Tr. 1319, ll. 14-17; 1369, ll. 8-110; 1377, ll. 2-12; 1381, ll. 2-3. *See Shuler,* 344 S.C. 604, 545 S.E.2d 805, *cert. denied,* 534 U.S. 977, 122 S.Ct. 404; *Gilchrist v. State*, 350 S.C. at 227, 565 S.E.2d at 285.

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XII. Trial Counsel failed to object to the Solicitor's improper comments in violation of the Golden Rule during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments.

In *Von Dohlen v. State*, 360 S.C. 598, 611, 602 S.E.2d 738, 745 (2004), our Supreme Court noted, "[o]ther courts, including our own Court of Appeals, uniformly have condemned and prohibited golden rule arguments in criminal and civil settings". *See State v. Reese*, 359 S.C. 260, 271, 597 S.E.2d 169, 175 (Ct. App. 2004) (recognizing that a "Golden Rule" argument which suggests to jurors to put themselves in the shoes of one of the parties is generally impermissible because it encourages the jurors to depart from neutrality and to decide the case on the basis of personal interest and bias rather than evidence), *aff'd in part and rev'd in part*, 370 S.C. 31, 633 S.E.2d 898 (2006) (affirming the Court of Appeals' finding that the defendant was entitled to a new trial based on the solicitor's "Golden Rule" closing argument).

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing to object to the Solicitor's improper comments (references to the juror's community versus gang turf) in violation of the Golden Rule during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Tr. 1392, l. 15 – 1393, l. 30; *See Von Dohlen*, 360 S.C. at 611, 602 S.E.2d at 745; *Reese*, 359 S.C. at271, 597 S.E.2d at 175.

XIII. Trial Counsel failed to properly object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors.

In *United States v. Santiago*, 643 F.3d 1007, 1011 (7th Cir. 2011), the Seventh Circuit Court of Appeals held that juries are "likely to associate gangs with criminal activity

and deviant behavior, such that the admission of gang evidence raises the specter of guilt by association or a verdict influenced by emotion." (internal quotation marks omitted)); *Cf. United States v. Archuleta*, 737 F.3d 1287, 1295 (10th Cir. 2013), cert. denied, 134 S. Ct. 2859 (2014) ("Any unfairness from gang-affiliation testimony stems from the implicit connection [drawn] between the crimes committed by gangs and the defendant gang member. In most cases, concern about such innuendo would be proper, because ordinarily the jury should not assume that the defendant gang member committed the [gang's] crimes."); See Rules 403 and 702, SCRE.

In *State v. Owens*, 378 S.C. 636, 638, 664 S.E.2d 80, 81 (2008), our Supreme Court held constitutional claims are not preserved for review without a contemporaneous objection at trial. *See State v. Smith*, 337 S.C. 27, 32, 522 S.E.2d 598, 600 (1999) ("A ruling in limine is not final; unless an objection is made at the time the evidence is offered and a final ruling procured, the issue is not preserved for review."); *State v. Dunbar*, 356 S.C. 138, 142, 587 S.E.2d 691, 693-94 (2003) (arguments not raised below and ruled on by the court are not preserved for appellate review).

Discussion

In this case, Trial Counsel provided ineffective assistance of counsel by failing to properly object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors. *See Santiago*, 643 F.3d at 1011; *Archuleta*, 737 F.3d 1287, 1295 (10th Cir. 2013), cert. denied, 134 S. Ct. 2859.

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XIV. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of teardrop tattoos and possible meaning of hash marks tattoos was inadmissible and preserved for appellate review.

As seen above, the pre-trial hearing addressed the admissibility of the State's gang expert testimony on multiple grounds. The trial judge expressly considered the hearsay argument under *State v. Price*, 368 S.C. 494, 629 S.E.2d 363 and employed a Rule 403, SCRE analysis. Trial counsel argued that any testimony about certain tattoos meaning Mr. Liverman had killed people would be "character assignation" and "grossly and unduly prejudicial." These objections were renewed when the State called its gang expert witnesses.

Due process requires a defendant receive effective assistance of counsel on direct appeal. *Evitts v. Lucey*, 469 U.S. 387, 396 (1985). Effectiveness of appellate counsel is judged under *Strickland*. *Smith v. Robbins*, 528 U.S. 259 (2000). Appellate counsel is ineffective for not raising a meritorious issue entitling an appellant to relief. *See, e.g., Southerland v. State*, 337 S.C. 610, 524 S.E.2d 833 (1999); *Patrick v. State*, 349 S.C. 203, 562 S.E.2d 609 (2002). Here, appellate counsel was deficient for two reasons. First, appellate counsel did not argue that the most prejudicial portions of the expert testimony was inadmissible hearsay under *State v. Price*. Second, appellate counsel did not argue that trial counsel had preserved the Rules 403 and 404, SCRE objection when they argued attributing meanings to the tattoos was prejudicial character assignation.

XV. Appellate Counsel failed to appeal the portion of the S.C. Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

In *Evitts v. Lucey*, 469 U.S. 387 (1985), the Supreme Court of the United Stated held tjat a criminal defendant is constitutionally entitled to the effective assistance of

appellate counsel, and to be effective, appellate counsel must give assistance of such quality as to make appellate proceedings fair. *See Simpkins v. State*, 303 S.C. 364, 401 S.E.2d 142 (1991) (post-conviction relief granted where appellate counsel failed to raise an issue on appeal that constituted reversible error); *Southerland*, 337 S.C. at 617, 524 S.E.2d at 836 (Southerland "met his burden of demonstrating both that appellate counsel's performance was deficient and that, but for the deficient performance, the result of his appeal would have been different").

CONCLUSION

Based on the foregoing reasons, the undersigned Counsel respectfully requests that this Court grant Applicant's application for PCR. *See Strickland v. Washington*, 466 U.S. 668 (1984); U.S. Const. amends. V, VI, XIV; S.C. Const. art. I, §§ 3 and 14; *See* S.C. Code § 17-27-20(A)(1), (4), and (6).

Respectfully submitted,

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ATTORNEYS FOR THE APPLICANT

February 8, 2019

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the within and foregoing Memorandum in Support of Applicant's PCR Application by depositing a true and correct copy of the same via first-class mail, postage prepaid, upon all parties as follows:

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FILED
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February 8, 2019

STATE OF SOUTH CAROLINA)	IN THE COURT OF COMMON PLEAS
)	IN THE FIFTH JUDICIAL CIRCUIT
COUNTY OF RICHLAND)	
)	
Chris A. Liverman, #308393,)	Case No.: 2012-CP-40-04870
Applicant,)	
)	**RESPONDENT'S MEMORANDUM**
v.)	**IN OPPOSITION TO PCR**
)	
State of South Carolina,)	
Respondent.)	

FILED
RICHLAND COUNTY
2019 DEC 15 AM 8:09
JEANNETTE W. WALKER
CLERK OF COURT

This matter comes before the Court by way of an Application for Post-Conviction Relief (PCR) filed July 17, 2012. Respondent made its Return on October 15, 2012. Applicant amended the application on March 6, 2013, August 7, 2018, and December 11, 2018.[1] An evidentiary hearing into the matter was convened on December 17, 2018, at the Richland County Courthouse before the Honorable R. Scott Sprouse. E. Charles Grose, Jr., and Dayne C. Phillips, Esquires, represented Applicant. Lindsey A. McCallister and W. Edgar Salter, Esquires, of the South Carolina Attorney General's Office, represented Respondent.

At the hearing, Applicant testified on his own behalf. Applicant also presented testimony from Dr. Dawn McQuiston, and Elizabeth Anne Franklin-Best, Esquire, Applicant's trial counsel. At the close of all the evidence, the Court indicated it would take this matter under advisement, and the parties requested the opportunity to submit post-trial briefs. This Memorandum follows.

[1] In what appears to be a scrivener's error, the amendments filed August 7, 2018, and December 11, 2018, are both entitled "Second Amended Application for Post-Conviction Relief," although the two documents contain slightly different allegations.

PROCEDURAL HISTORY

Applicant is presently confined in the South Carolina Department of Corrections pursuant to orders of commitment of the Richland County Clerk of Court. Applicant was true-bill indicted at the April 2005 term of the Richland Grand Jury for two counts of murder (2005-GS-40-6831, -6832). He was represented by Elizabeth Anne Franklin-Best (Franklin-Best), Esquire; Maxwell Schardt, Esquire; and Carolyn Gripp, Esquire, on the charges. On October 30, 2006, Applicant proceeded to jury trial before the Honorable James W. Johnson, Jr, and a jury. On November 9, 2006, Applicant was found guilty of both charges as indicted and sentenced to life imprisonment without parole on each count, to run consecutively.

A timely notice of appeal was filed and an appeal was perfected on Applicant's behalf. He was represented by A. Mattison Bogan, Esquire, and Chief Appellate Defender Robert M. Dudek, Esquire, of the South Carolina Office of Appellate Defense on the appeal. After briefing, the matter proceeded to oral argument before the South Carolina Supreme Court on February 23, 2012. On June 6, 2012, the Court issued an opinion affirming the convictions in result. State v. Liverman, Op. No. 27130 (S.C. filed June 6, 2012). The remittitur was issued June 26, 2012.

ALLEGATIONS

At the hearing, Counsel for Applicant clarified that the December 11, 2018, amendments were meant to supersede the allegations contained in the original application and all other amendments. Applicant ultimately went forward only on the following allegations contained in the amended application filed December 11, 2018:

1. Ineffective Assistance of Trial Counsel, in that:
    a. Trial Counsel failed to conduct a reasonable investigation and to develop all available, relevant, and admissible mitigating evidence in preparation for trial. . . . Specifically, Trial Counsel failed to consult with an expert witness for an independent review of the eye-witness identification evidence implicating Applicant as the murderer when it was reasonable and necessary;

b. Trial Counsel improperly argued irrelevant and highly prejudicial character evidence during the Applicant's opening statement by telling the jurors that Applicant had been incarcerated for twenty-six months prior to his jury trial;
c. Trial Counsel failed to move for suppression of objectively false evidence that Applicant stole the gun that was used in the murders, resulting in Trial Counsel having to introduce otherwise inadmissible, irrelevant, and highly prejudicial character evidence that Applicant was incarcerated when the gun used during the homicide was stolen;
d. Trial Counsel failed to object to improper and highly prejudicial testimony by witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family;
e. Trial Counsel failed to object to the admissibility of any testimony, by either lay or expert witnesses, that Applicant was a member of a gang, when such evidence was not relevant to the State's case and was inadmissible, unduly prejudicial character evidence;
f. Trial Counsel failed to object to the admissibility of the State's gang expert witness testimony;
g. Trial Counsel failed to preserve for appellate review objects to highly prejudicial testimony of the State's gang expert witnesses, including by not limited to testimony about possible meanings of the teardrop tattoos and hash mark tattoos;
h. Trial Counsel improperly called an expert witness to testify about gangs, including the possible meaning of tattoos, when it only served to bolster the credibility of the State's gang expert witnesses and enhance the State's improper and highly prejudicial evidence;
i. Trial Counsel failed to object to the Solicitor's improper comments during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Specifically, Trial Counsel failed to object when the Solicitor argued in closing, "There is not a single witness, or any evidence in this case, that points to anyone other than [Applicant] as being the shooter, the murderer." This unduly prejudicial argument was both burden shifting and an impermissible a comment on the Applicant's right not to testify;
j. Trial Counsel failed to call an expert witness to testify in rebuttal of the eye-witness identification evidence presented by the State at trial when it was reasonable and necessary to present this critical evidence;
k. Trial Counsel failed to object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors (sic). . . .;
l. Trial Counsel failed to object to improper and highly prejudicial testimony by a State's witness that he was scared to testify but was testifying for the victims and their family.

2. Ineffective Assistance of Appellate Counsel, in that:
   a. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the testimony of the State's gang expert witness was entirely inadmissible;
   b. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of the teardrop tattoos was inadmissible;

c. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of the hash mark tattoos was preserved for appellate review;
d. Appellate Counsel failed to appeal the portion of the S.C. Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

Applicant added two more allegations regarding trial counsel's performance prior to the start of the hearing:

1. Trial Counsel failed to object to improper vouching and bolstering of two witnesses, Shante Bethel and Diego Thompson, during the State's closing argument;
2. Trial Counsel failed to object when the State presented improper Golden Rule and burden-shifting arguments during closing arguments.

ARGUMENT

In a PCR action, an applicant bears the burden of proving the allegations in his application. Butler v. State, 286 S.C. 441, 334 S.E.2d 813 (1985). Where the application alleges ineffective assistance of counsel as a ground for relief, Applicant must prove "counsel's conduct so undermined the proper functioning of the adversarial process that [it] cannot be relied upon as having produced a just result." Strickland v. Washington, 466 U.S. 668 (1984); Butler, 286 S.C. at 442, 334 S.E.2d at 814.

In evaluating allegations of ineffective assistance of counsel, the reviewing court applies the two-pronged test outlined in Strickland. First, Applicant must prove counsel's performance was deficient. Id.; Cherry v. State, 300 S.C. 115, 117, 386 S.E.2d 624, 625 (1989). Under this prong, the court measures an attorney's performance by its "reasonableness under prevailing professional norms." Cherry, 300 S.C. at 117, 386 S.E.2d at 625 (quoting Strickland, 466 U.S. at 690). The proper measure of performance is whether the attorney provided representation within the range of competence required in criminal cases. Butler, 286 S.C. at 442, 334 S.E.2d at 814. "Counsel is strongly presumed to have rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment." Id. (citing Strickland, 466 U.S. at

690). Applicant must overcome this presumption to receive relief. Cherry, 300 S.C. at 118, 386 S.E.2d at 625. Second, counsel's deficient performance must have prejudiced Applicant such that "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different." Id. at 117-18, 386 S.E.2d at 625.

Applicant also alleges ineffective assistance of appellate counsel. A defendant is entitled to effective assistance of appellate counsel. Southerland v. State, 337 S.C. 610, 615, 524 S.E.2d 833, 836 (1999). Although appellate counsel is required to provide effective assistance of counsel, "appellate counsel is **not** required to raise every non-frivolous issue that is presented by the record." Thrift v. State, 302 S.C. 535, 539, 397 S.E.2d 523, 526 (1990) (citing Jones v. Barnes, 463 U.S. 745 (1983)) (emphasis added). "For judges to second-guess reasonable professional judgments and impose on ... counsel a duty to raise every 'colorable' claim suggested by a client would disserve the very goal of vigorous and effective advocacy. . . ." Tisdale v. State, 357 S.C. 474, 476, 594 S.E.2d 166, 167 (2004) (citing Jones, 463 U.S. at 754). Where the strategic decision to exclude certain issues on appeal is based on reasonable professional judgment, the failure to appeal all trial errors is not ineffective assistance of counsel. Griffin v. Aiken, 775 F.2d 1226 (4th Cir. 1985).

Generally, in analyzing a claim of ineffective assistance of appellate counsel, the Court applies the Strickland test just as it would when analyzing a claim of ineffective assistance of trial counsel. See Southerland, 337 S.C. at 616, 524 S.E.2d at 836 (1999). Thus, in this case, we ask first whether appellate counsel's performance was deficient, and two, whether Applicant was prejudiced by appellate counsel's deficient performance. Bennett v. State, 383 S.C. 303, 309, 680 S.E.2d 273, 276 (2009). To prove prejudice, an applicant must show that, but for appellate

counsel's errors, there is a reasonable probability he would have prevailed on appeal. Anderson v. State, 354 S.C. 431, 434, 581 S.E.2d 834, 835 (2003).

I. Allegations 1(a), (j): Trial Counsel was ineffective in failing to consult with and call at trial an expert in eyewitness identification.

Applicant alleges his trial counsels were deficient for failing to consult with an expert on eyewitness identification and for failing to call such an expert to rebut testimony presented by the State. In support of this claim, Applicant presented the testimony of Dr. Dawn McQuiston (McQuiston), Ph. D., who was qualified as an expert in memory and eyewitness identification.

McQuiston testified generally to issues that may be present regarding memory and eyewitness identifications. According to McQuiston, memory decays over time, and people's limited ability for attention can lead to errors in perception which contribute to misidentifications. McQuiston also testified there is scientific data to show misidentification occurs, although she could not say whether it was a "common" occurrence. McQuiston also testified familiarity does not necessarily make an identification more accurate, nor does confidence, although there is some relationship between the person's confidence in the identification and its accuracy. Finally, McQuiston testified an identification from a line up is more reliable than a show up identification. Both McQuiston and Franklin-Best testified McQuiston's testimony may have been helpful at trial to help the jurors better understand all of the issues surrounding eyewitness identifications. Franklin-Best testified although she was aware of the ability to secure forensic experts for the defense, she did not consider hiring an expert on this particular issue.

However, crucially, McQuiston admitted she could not testify as to the reliability of the specific identification in this case, nor was she in any better position to say if a particular identification was accurate than a juror. In this case, the witness, Tyrone Smith, identified

Applicant by his nickname, Baby Jesus, before officers even knew a suspect had been detained and before the show up occurred. Tr. p. 768. Further, although there were some issues with the identification, such as the suggestiveness of the show up procedure, trial counsel pointed out these issues on cross-examination. Additionally, another witness, Diego Thompson, who testified he was part of the group that traveled to T.S. Martin on the night of the shooting, identified Applicant as the shooter, and Applicant's *own statement* to law enforcement acknowledges he was at the scene and firing a gun. Tr. pp. 265-76.

"Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. "It is all too tempting for a defendant to second-guess counsel's assistance after conviction or adverse sentence, and it is all too easy for a court, examining counsel's defense after it has proved unsuccessful, to conclude that a particular act or omission of counsel was unreasonable. A fair assessment of attorney performance requires that every effort be made to eliminate the distorting effects of hindsight, to reconstruct the circumstances of counsel's challenged conduct, and to evaluate the conduct from counsel's perspective at the time." Id. at 689. Further, "while the Constitution requires that a criminal defendant receive effective assistance of counsel, the presentation of expert testimony is not necessarily an essential ingredient of a reasonably competent defense." Bonin v. Calderon, 59 F.3d 815, 834 (9th Cir. 1995). Counsel's failure to procure expert witnesses does not render his or her representation deficient when counsel vigorously cross-examines the State's witnesses and attacks the accuracy of the evidence. Lorenzen v. State, 376 S.C. 521, 531, 657 S.E.2d 771, 777 (2008). Here, Counsel vigorously cross-examined the witnesses Tyrone Smith and Deigo Thompson regarding

their assertions Applicant was the shooter. Tr. pp. 287-358, 777-824. Applicant's trial counsel also argued the show up was suggestive, Smith's inconsistent statements regarding his prior familiarity with Applicant, and the distance from which Smith viewed the shooting. Despite Franklin-Best's second-guessing of her own performance in hindsight, her decision not to consult with or call an expert on this witness did not render her representation of Applicant constitutionally deficient, as she was able to attack the credibility of the identification in various other ways. See Wright v. Hopper, 169 F.3d 695, 707 (11th Cir. 1999) ("The question of ineffectiveness is a question for the court to decide so admissions of defective performance by attorneys are not decisive.").

Finally, "[a]n error by counsel, even if professionally unreasonable, does not warrant setting aside the judgment of a criminal proceeding if the error had no effect on the judgment." Strickland, 466 U.S. at 691. To establish prejudice, Applicant is required to show "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different. A reasonable probability is a probability sufficient to undermine confidence in the outcome." Id. at 694. There was significant evidence in the case supporting the reliability of this specific identification of Applicant by Tyrone Smith, which could not be overcome by McQuiston's testimony since she is unable to comment on the reliability of this particular identification.

Therefore, because Applicant cannot prove either deficiency or prejudice regard to the expert witness issue, these allegations should be denied and dismissed.

II. Allegation 1(b): Trial Counsel improperly argued irrelevant and highly prejudicial character evidence during Applicant's opening statement.

Applicant argues trial counsel was ineffective by telling the jurors Applicant had been incarcerated for twenty-six months prior to his jury trial in the defense's opening statement. The

attorney who gave the opening, Maxwell Shardt, was unavailable to testify at trial, and Franklin-Best testified she was not aware he was going to make such an argument beforehand. However, it is clear from the record and the context of the opening, as well as the defense's overall strategy, counsel's decision was a strategic one.

"Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. There is a strong presumption that counsel's decisions are based on tactical strategy rather than neglect. Yarborough v. Gentry, 540 U.S. 1, 8 (2003) (quoting Massaro v. United States, 538 U.S. 500 (2003)). When counsel articulates valid reasons for employing certain strategy, such conduct will not be deemed ineffective assistance of counsel. Stokes v. State, 308 S.C. 546, 419 S.E.2d 778 (1992); Ingle v. State, 348 S.C. 467, 470, 560 S.E.2d 401, 402 (2002) (holding counsel may avoid a finding of ineffectiveness if he articulates a valid reason for using a certain strategy). "Because of the difficulties inherent in making the evaluation, a court must indulge a strong presumption that counsel's conduct falls within the wide range of reasonable professional assistance; that is, the defendant must overcome the presumption that, under the circumstances, the challenged action might be considered sound trial strategy." Strickland, 466 U.S. at 689.

Here, Schardt stated during his opening Applicant had been in jail for twenty-six months, and it was public knowledge Applicant "was their guy," and law enforcement had been focused on him that entire time, rather than following the evidence. Tr. pp. 117-18. Schardt concluded by telling the jury Applicant had been waiting for twenty-six months for them to send him home. Tr. p. 130. It is clear from a full reading of the opening statement and from the record as a

whole, Schardt was arguing the police investigation was deficient because they had jumped to the conclusion Applicant was the perpetrator and pursued that theory, rather than letting the evidence tell them what to do or what avenues to pursue. It is also clear Schardt was making this argument in order to point to Applicant's innocence, rather than his guilt.

Judicial scrutiny of counsel's performance must be highly deferential. Id. at 689. Additionally, courts should not "insist counsel confirm every aspect of the strategic basis for his or her actions." Harrington v. Richter, 562 U.S. 86, 109 (2011). Where, as here, a strategic basis can be deduced from the record, trial counsel's performance should not be found deficient. Accordingly, this allegation should be denied and dismissed.

III. Allegation 1(c): Trial Counsel failed to object to improper testimony regarding the gun used in the homicide, since Applicant was in jail when that gun was originally stolen.

Applicant alleges trial counsel failed to object when the State presented evidence showing the gun used in the homicide had been stolen because Applicant was in jail during the timeframe of the theft, and refuting such evidence required the defense to present otherwise inadmissible evidence implicating Applicant's character. As an initial matter, the extent Applicant is arguing the introduction of this evidence constituted prosecutorial misconduct, that allegation was not plead, and relief should not be granted on that ground. Instead, Applicant has framed the issue as one of ineffective assistance of trial counsel for failing to object.

Applicant asserts this evidence was "highly prejudicial" because it required the defense to admit evidence showing Applicant was in jail at the time of the theft. However, contrary to Applicant's description of this evidence as harmful to his case, it was instead beneficial and consistent with the defense theory, as testified to by Franklin-Best, that the shooter was not Applicant, but was Diego Thompson. The evidence showing Applicant was in jail at the time of

the gun theft refuted Thompson's testimony Applicant stole the gun, putting Thompson's credibility in doubt. The State's investigator agreed the identity of the person who stole the gun was important to the murder investigation, and law enforcement knew it could not have been Applicant. Tr. p. 1338. The defense was then able to argue in closing the State had not tied the gun to Applicant, and that fact, along with the fact the gun was not found where Thompson said it was or near where Applicant was arrested, was evidence Thompson was the shooter rather than Applicant. Thus, because the introduction of this evidence was consistent with the defense theory, Applicant's trial counsels were not deficient for introducing it, and this allegation should be denied and dismissed.

IV. Allegations 1(d), (l): Trial Counsel failed to object to testimony by witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family.

Applicant alleges his counsels were ineffective for failing to object when Tyrone Smith testified he was "scared to be on T.V," but was testifying for the victims and their families. Tr. pp. 775-76. Applicant has failed to meet his burden of proof as to this allegation.

In the exchange at issue, Smith states he is comfortable with testifying because there were no cameras in the courtroom and his concern was being on television, because Applicant "is a brother." Tr. p. 775. Franklin-Best testified she should have objected because this testimony was bolstering and impermissible character evidence. However, Applicant's gang affiliation was uncontested at trial. Further, Smith never testified he was afraid of Applicant himself or that anyone had threatened him. If anything, his testimony implies he is afraid of *other* community members who might see him on television, not Applicant. Finally, the reference to Smith being afraid was fleeting, comprising seventeen lines in a transcript of more than one-thousand pages.

To establish prejudice, Applicant is required to show "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different. A reasonable probability is a probability sufficient to undermine confidence in the outcome." Strickland, 466 U.S. at 694. Accordingly, because Applicant's presentation on this issue was insufficient to meet his burden of proof as to the prejudice prong, and therefore, this allegation should be denied and dismissed. See, e.g., Bannister v. State, 333 S.C. 298, 303, 509 S.E.2d 807, 809 (1998) ("This Court has repeatedly held a PCR applicant must produce the testimony of a favorable witness or otherwise offer the testimony in accordance with the rules of evidence at the PCR hearing in order to establish prejudice. . . .).

V. Allegations 1(e) -(h), (k): Trial Counsel failed to object to or otherwise preserve for appellate review testimony from the State's witnesses regarding to Applicant's gang affiliation and the possible meaning of Applicant's tattoos, and Trial Counsel called an expert that only served to reinforce the State's expert witness testimony regarding the meaning of the tattoos.

First, Applicant contends evidence of his gang affiliation was "irrelevant" and "highly prejudicial." In fact, the entire theory of the State's case was based on this shooting being a gang-related retaliation; thus Applicant's membership in the Folk Nation gang was clearly relevant. Additionally, Applicant's counsel objected to the testimony of the State's expert witnesses on multiple bases, in both the pre-trial motion hearing and at trial.

The defense's main argument was that the State was unable to establish what the tattoos meant to Applicant, specifically. Tr. p. 19. The defense also argued the testimony was improper "propensity" evidence, overly prejudicial, and based on inadmissible hearsay. Pre-Trial Tr. pp. 5-9, 112-17; Tr. pp. 12-24, 901. Although the initial objections were overruled, Franklin-Best made multiple motions for a mistrial based on the testimony actually elicited, arguing the portion of the experts' testimony attributing "bodies" to the tattoos was "inflammatory," irrelevant,

based on hearsay which violated Applicant's rights under the Confrontation Clause, and was improper "propensity" evidence. Tr. pp. 919-24, 971-73. Thus, it is clear from the transcript the defense counsel fought the admission of this testimony on multiple grounds.

However, Franklin-Best testified at the evidentiary hearing she should have objected based on character, and she should have argued the evidence did not meet the Council test for admissibility. State v. Council, 335 S.C. 1, 515 S.E.2d 508 (1999) (holding when admitting scientific evidence, the trial judge must find the evidence will assist the trier of fact, the expert is qualified, and the evidence is reliable). However, Council applies to scientific evidence, and at the time of Applicant's trial, was not the standard for non-scientific expert testimony, which was governed instead by State v. Morgan, 326 S.C. 503, 485 S.E.2d 112 (Ct. App. 1997). The testimony at issue here was much like that at issue in Morgan, in that it was not based on rigorous scientific data and testing, but instead on the observations and experience of the testifying experts. In those instances, Morgan instructed the reliability of the expert testimony went to the weight of the evidence, not its admissibility. 326 S.C. at 513, 485 S.E.2d at 118. Morgan was not overruled until 2009, thus it was the law at the time of Applicant's trial, and any argument for use of the Council standard would have been incorrect. Applicant's trial counsel was therefore not deficient for failing to object to on that ground.

Additionally, Applicant's appellate counsel raised the issue of the expert testimony regarding "bodies" being attributed to the tattoos on appeal. Although the Court of Appeals found it was not preserved as to the character evidence argument, it nevertheless addressed the issue on the merits, finding any error in the admission of such evidence harmless given the eyewitness identifications of Applicant as the shooter and Applicant's own incriminating statement. State v. Liverman, Op. No. 27130 (S.C. filed June 6, 2012). An issue that was raised

on direct appeal but found to be unpreserved may be raised in the context of a post-conviction relief claim alleging ineffective assistance of counsel. McHam v. State, 404 S.C. 465, 475, 746 S.E.2d 41, 47 (2013) (citing McLaughlin v. State, 352 S.C. 476, 575 S.E.2d 841 (2003); Foye v. State, 335 S.C. 586, 518 S.E.2d 265 (1999)). However, to be entitled to relief on such a claim, an applicant must establish the underlying claim is meritorious and would have resulted in a reversal on appeal to a reasonable probability. McHam, 404 S.C. at 475–76, 746 S.E.2d at 47 ("Since the Fourth Amendment issue was not considered on direct appeal because it was unpreserved, an examination of the merits of the issue is appropriate in analyzing the prejudice prong in McHam's PCR claim."). Therefore, before a post-conviction relief court can grant relief on a claim of ineffective assistance of trial counsel for failing to preserve a ground for appellate review, the court must determine the underlying claim was meritorious and a reasonable probability that it would have resulted in reversal and a new trial. Here, the Court of Appeals explicitly found the admission of the gang expert testimony was harmless, and therefore, Applicant cannot meet his burden as to the prejudice prong.

Finally, Applicant argues Franklin-Best was deficient in failing to call a defense expert (Walker) regarding the tattoos when his testimony only served to reinforce the opinions of the State's experts. However, this characterization of Walker's testimony is unjustified. Walker had extensive law enforcement credentials, and testified there were multiple possible meanings for the teardrop tattoos other than signifying "bodies," including that a friend or family member had died, serving time, or simply being a copycat. Tr. pp. 1164, 1169. He also pointed to multiple celebrities with teardrop tattoos including the rapper Lil Wayne and the basketball player Larry Hughes. Tr. p. 1196. Walker also testified the hash mark tattoos signified rank, not "bodies." Tr.

p. 1173. Finally, Walker helped build the defense's argument that no expert could say definitively say what the tattoos meant, as only Applicant would know. Tr. pp. 1174-75.

Thus, calling Walker as a defense witness was a reasonable strategic decision to counter the presentation of the State's expert witnesses, and Applicant's counsels were not deficient in doing so. "Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. There is a strong presumption that counsel's decisions are based on tactical strategy rather than neglect. Yarborough v. Gentry, 540 U.S. 1, 8 (2003) (quoting Massaro v. United States, 538 U.S. 500 (2003)). "Accordingly, when counsel articulates a valid reason for employing a certain strategy, such conduct will not be deemed ineffective assistance of counsel." Smith v. State, 386 S.C. 562, 567, 689 S.E.2d 629, 632 (2010) (citing Caprood v. State, 338 S.C. 103, 110, 525 S.E.2d 514, 517 (2000)). See also Stokes v. State, 308 S.C. 546, 419 S.E.2d 778 (1992) (holding where counsel articulates valid reasons for employing certain strategy, such conduct will not be deemed ineffective assistance of counsel); Ingle v. State, 348 S.C. 467, 470, 560 S.E.2d 401, 402 (2002) (holding counsel may avoid a finding of ineffectiveness if he articulates a valid reason for using a certain strategy).

Because Applicant has shown neither deficiency nor prejudice regarding the defense's handling of the expert witness testimony, these allegations should be denied and dismissed.

VI. Allegation 1(i): Trial Counsel failed to object to various improper comments during the State's closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments.

Applicant alleges trial counsel should have objected to the solicitor's argument in closing, "There is not a single witness, or any evidence in this case, that points to anyone other

than [Applicant] as being the shooter, the murderer." Tr. p. 1319. Applicant contends this argument was both burden shifting and an impermissible a comment on the Applicant's right not to testify. Applicant also alleges trial counsel should have objected to improper vouching and bolstering of two witnesses, Shante Bethel and Diego Thompson, and to improper Golden Rule and burden-shifting arguments during the State's closing. Tr. pp. 1319-20, 1392.

Here, the solicitor's statement that there were no witnesses or evidence pointing to anyone other than Applicant as the shooter is clearly within the bounds of permissible argument. The solicitor did not argue "the defendant" or "the defense" had failed to present such evidence; she was merely commenting on her view of the all the evidence presented at trial. Tr. p. 1319. This is a permissible comment for a solicitor to make, as the State has a right to argue its version of the facts and credibility of the evidence. Further, the defense called Diego Thompson and Shante Bethel "liars" during closing, which put their credibility in issue before the jury, as it always is, and the State had a right to respond to the defense's characterization of those witnesses. Tr. p. 1337.

"A solicitor's closing argument must be carefully tailored so as not to appeal to the personal biases of the jury." Von Dohlen v. State, 360 S.C. 598, 609, 602 S.E.2d 738, 744 (2004). "The argument must not be calculated to arouse the jurors' passions or prejudices, and its content should stay within the record and reasonable inferences that may be drawn therefrom." Id. at 609-10, 602 S.E.2d at 744. "If a solicitor's closing argument remains within the record evidence and the reasonable inferences therefrom, no error occurs. Undoubtedly, a solicitor may argue the State's version of the testimony presented, and furthermore may comment on the weight to be accorded such testimony." State v. New, 338 S.C. 313, 319, 526 S.E.2d 237, 240 (Ct. App. 1999) (internal citations omitted). However, "[i]mproper comments do not

automatically require reversal if they are not prejudicial to the defendant, and the [defendant] has the burden of proving he did not receive a fair trial because of the alleged improper argument." Humphries v. State, 351 S.C. 362, 373, 570 S.E.2d 160, 166 (2002). "The relevant question is whether the solicitor's comments so infected the trial with unfairness as to make the resulting conviction a denial of due process." Id.

None of the comments at issue in this case were so prejudicial as to amount to a denial of due process, particularly in the context of the whole trial. See State v. Rudd, 355 S.C. 543, 550, 586 S.E.2d 153, 157 (Ct. App. 2003) (appellate courts will review the alleged impropriety of an opening or closing argument in the context of the entire record). In Smith v. State, 375 S.C. 507, 654 S.E.2d 523 (2007), abrogated on other grounds by Smalls v. State, 422 S.C. 174, 810 S.E.2d 836 (2018), the Supreme Court concluded any impropriety in the solicitor's closing argument was not sufficient to grant post-conviction relief where the solicitor's improper use of the pronoun "I" was limited, did not recur throughout his argument, there was overwhelming evidence of the defendant's guilt, and the trial judge instructed the jury not to consider counsels' statements as evidence. Similarly, the trial court in Applicant's case instructed the jury the attorneys would recount their recollections of the testimony, but if what the attorneys said differed from the jurors' own recollections, they were to rely on their own memories. Tr. p. 1298. He also instructed jurors it was their duty to judge the credibility of witnesses, and in doing so, they could consider whether a witness had exhibited any interest, any motive, any bias, or any prejudice in the case." Tr. pp. 1403-05. In this context of the closing arguments and jury instructions taken as a whole, the solicitor's comments were not so prejudicial as to deprive Applicant of due process.

Therefore, because Applicant has failed to prove either deficiency or prejudice, these allegations should be denied and dismissed.

VII. Allegation 2(a)-(d): Appellate Counsel was ineffective in his handling of the gang expert testimony on appeal.

Applicant alleges appellate counsel was ineffective because he failed to argue on appeal before the S.C. Court of Appeals that the testimony of the State's gang expert witness was entirely inadmissible, failed to argue the State's gang experts' opinion about the possible meaning of the teardrop tattoos was inadmissible, failed to argue the State's gang experts' opinion about the possible meaning of the hash mark tattoos was preserved for appellate review, and failed to appeal the portion of the S.C. Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

As an initial matter, the State notes Applicant has alleged both trial counsel was ineffective in failing to preserve these issues and appellate counsel was ineffective in failing to raise them. It cannot be both ways, as appellate counsel cannot be deficient for failing to raise an unpreserved issue. Legge v. State, 349 S.C. 222, 562 S.E.2d 618 (2002). Further, Applicant did not present any testimony at the evidentiary hearing regarding appellate counsel's performance, and therefore he is unable to overcome the presumption in favor of appellate counsel that appellate counsel's decisions regarding which issues to raise where based on strategy rather than neglect. Therefore, these allegations should be deemed waived based on Applicant's failure to present evidence as to these issues and/or denied and dismissed due to Applicant's failure of proof.

Notwithstanding the procedural objection, Applicant has not met his burden on the merits of these allegations. Although appellate counsel is required to provide effective assistance of

counsel, "appellate counsel is **not** required to raise every non-frivolous issue that is presented by the record." Thrift v. State, 302 S.C. 535, 539, 397 S.E.2d 523, 526 (1990) (citing Jones v. Barnes, 463 U.S. 745 (1983)). "For judges to second-guess reasonable professional judgments and impose on. . . counsel a duty to raise every 'colorable' claim suggested by a client would disserve the very goal of vigorous and effective advocacy...." Tisdale v. State, 357 S.C. 474, 476, 594 S.E.2d 166, 167 (2004) (citing Jones, 463 U.S. at 754). Generally, in analyzing a claim of ineffective assistance of appellate counsel, the Court applies the Strickland test just as it would when analyzing a claim of ineffective assistance of trial counsel. See Southerland, 337 S.C. at 616, 524 S.E.2d at 836 (1999). Thus, in this case, we ask first whether appellate counsel's performance was deficient, and two, whether Applicant was prejudiced by appellate counsel's deficient performance. Bennett v. State, 383 S.C. 303, 309, 680 S.E.2d 273, 276 (2009). To prove prejudice, an applicant must show that, but for appellate counsel's errors, there is a reasonable probability he would have prevailed on appeal. Anderson v. State, 354 S.C. 431, 434, 581 S.E.2d 834, 835 (2003).

In this instance, appellate counsel raised two claims on their merits, and although the issue of the gang expert testimony was found to be unpreserved, the Court of Appeals still considered the merits of both issues. Appellate counsel then selected the show-up issue for further appeal to the Supreme Court See Jones v. Barnes, 463 U.S. 745, 751-52 (1983) ("Experienced advocates since time beyond memory have emphasized the importance of winnowing out weaker arguments on appeal and focusing on one central issue if possible, or at most on a few key issues."). "Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate

assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690.

Additionally, it is not reasonably likely Applicant would have prevailed on these issues. Indeed, the Court of Appeals found the admission of the gang expert testimony was harmless. Such an assessment is not likely to change no matter which argument appellate counsel made for its inadmissibility. "Generally, only when ignored issues are clearly stronger than those presented, will the presumption of effective assistance of counsel be overcome." Smith v. Robbins, 528 U.S. 259, 288, 120 S. Ct. 746, 765, 145 L. Ed. 2d 756 (2000) (quoting Gray v. Greer, 800 F.2d 644, 646 (C.A.7 1986)). Applicant has not met his burden of proving deficiency or prejudice. Therefore, this allegation should be denied and dismissed.

CONCLUSION

Based upon the foregoing analysis, Respondent submits that Applicant's claims of counsel's ineffectiveness are wholly meritless. The State respectfully asks the Court to deny and dismiss the application for post-conviction relief.

Respectfully submitted,

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3/12, 2019.

STATE OF SOUTH CAROLINA COUNTY OF RICHLAND CHRIS A. LIVERMAN, #308393 Applicant, vs STATE OF SOUTH CAROLINA, Respondent.	IN THE COURT OF COMMON PLEAS 2012-CP-40-04870 AFFIDAVIT OF SERVICE BY MAIL

2019 MAR 15 AM 8:09
JEANNETTE W. McBRIDE
C.C.P. & G.S.
FILED

1. I am an employee of the Respondent in the above-captioned action.

2. Regular communication by mail exists throughout the State of South Carolina and that this is a proper circumstance of service by mail.

3. I have this day served a copy of the **Respondent's Memorandum in Opposition to PCR** in the above-captioned matter on the following person by depositing same in the United States mail, postage prepaid:

Dayne C. Phillips
Price Benowitz LLP
1614 Taylor Street, Suite D
Columbia, South Carolina 29201

E. Charles Grose, Jr.
Grose Law Firm
404 Main Street
Greenwood, South Carolina 29646

DATED this the 13th day of March, 2019.

Carmen A. Nord, Legal Assistant
For Respondent

STATE OF SOUTH CAROLINA COUNTY OF RICHLAND Chris A. Liverman, #308393, Applicant, v. State of South Carolina, Respondent.	IN THE COURT OF COMMON PLEAS FOR THE FIFTH JUDICIAL CIRCUIT Case No.: 2012-CP-40-04870 **ORDER DENYING APPLICATION FOR POST-CONVICTION RELIEF**

2019 APR 23 AM 11:52

This matter comes before the Court by way of an application for post-conviction relief (PCR) filed July 17, 2012. Respondent made its Return on October 15, 2012. Applicant amended the application on March 6, 2013, August 7, 2018, and December 11, 2018.[1] An evidentiary hearing into the matter was convened on December 17, 2018, at the Richland County Courthouse before the Honorable R. Scott Sprouse, Jr. E. Charles Grose, Jr., and Dayne C. Phillips, Esquires, represented Applicant. Lindsey A. McCallister and W. Edgar Salter, III, Esquires, of the South Carolina Attorney General's Office, represented Respondent.

At the hearing, Applicant testified on his own behalf. Applicant also presented testimony from Dr. Dawn McQuiston, and trial counsel Elizabeth Anne Franklin-Best, Esquire. At the close of all the evidence, the Court indicated it would take this matter under advisement, and the parties requested the opportunity to submit post-trial briefs. This Court now denies and dismisses the application with prejudice.

[1] In what appears to be a scrivener's error, the amendments filed August 7, 2018, and December 11, 2018, are both entitled "Second Amended Application for Post-Conviction Relief," although the two documents contain slightly different allegations.

Emailed SCANNED

PROCEDURAL HISTORY

Applicant is presently confined in the South Carolina Department of Corrections pursuant to orders of commitment of the Richland County Clerk of Court. Applicant was indicted at the April 2005 term of the Richland Grand Jury for two counts of murder. He was represented by Elizabeth Anne Franklin-Best (Franklin-Best), Esquire; Maxwell Schardt, Esquire; and Carolyn Gripp, Esquire, on the charges. On October 30, 2006, Applicant proceeded to a jury trial before the Honorable James W. Johnson, Jr. On November 9, 2006, the jury convicted Applicant of both charges as indicted and sentenced to life imprisonment without parole on each count, to run consecutively.

A timely notice of appeal was filed, and an appeal was perfected on Applicant's behalf by Joseph L. Savitz, III, Esquire; A. Mattison Bogan, Esquire; and Robert M. Dudek, Esquire, of the South Carolina Commission on Indigent Defense - Appellate Defense Division. Applicant raised two issues before the Court of Appeals: (1) whether the trial judge erred in refusing to hold a Neil v. Biggers hearing on the reliability of the identification of Applicant as the shooter where the witness making the identification was familiar with Applicant before the identification took place, and (2) whether the trial court erred in admitting the State's gang expert testimony. By order filed December 4, 2009 the Court of Appeals affirmed Applicant's conviction finding a Biggers hearing was not necessary under controlling case law and finding the admission of the gang expert testimony was not preserved for appellate review, but was nonetheless harmless error. State v. Liverman, 386 S.C. 223, 687 S.E.2d 70 (Ct. App. 2009). Applicant's petition for rehearing was denied January 20, 2010.

Applicant then petitioned the South Carolina Supreme Court for a writ of certiorari, raising only the issue of the Neil v. Biggers hearing. After briefing, the matter proceeded to oral

argument before the South Carolina Supreme Court on February 23, 2012. On June 6, 2012, the Supreme Court issued an opinion affirming the convictions in result. State v. Liverman, 398 S.C. 130, 727 S.E.2d 422 (2012). The remittitur was issued June 26, 2012.

SUMMARY OF TESTIMONY ADDUCED AT TRIAL

On the night of August 26, 2004, twelve-year-old C.D. and sixteen-year-old T.M. were killed in a hail of gunfire aimed at C.D.'s house on T.S. Martin Drive. The murders resulted from a vendetta by members of the Folk Nation gang against a rival gang, the Bloods. Tr. pp.109-15; 121-58, 588-93. Three projectiles were recovered from the home, and ten fired cartridge casings were found a short distance from C.D.'s home. Tr. pp. 676-77, 683-86. Each victim died from injuries caused by a single gunshot wound to the head. Tr. pp. 979-87.

The events leading up to the murders unequivocally demonstrated a gang-related motive. Carl Duane Smith, aka Pooh, testified he and several friends had driven from the Bayberry Apartments complex over to T.S. Martin Drive earlier that evening. They were looking for a person named Delshawn, who was a member of the Bloods and had been involved in a confrontation with Pooh's friends earlier that day. Pooh and his friends were wearing black, the color of Folk Nation. They were unable to locate Delshawn, and they left after a girl called Pooh by name. Pooh later saw Applicant[2] at Bayberry Apartments and told him about what had occurred earlier. Applicant was accompanied at the time by his friend and fellow gang member, Reginald Joyner, aka Goo,[3] as well as several other people. Tr. pp. 205-08, 212.

[2] Applicant goes by the nickname Baby Jesus. Tr. pp. 200, 415, 751.
[3] Goo is deaf and communicates through sign language. Tr. p. 214.

Applicant then told Pooh that someone "from T.S. Martin had run him out from there" several days earlier. Applicant also showed Pooh three or four bullets Applicant claimed he had just obtained, and he told Pooh he had a .22 caliber gun. However, Pooh did not see the gun at that point. Applicant told Pooh he was going to T.S. Martin, and he said that he might "go on a lick." Pooh tried to stop Applicant from going to T.S. Martin because Pooh was afraid the girl who had recognized him earlier that day would blame him for any trouble. However, Applicant refused to ~~heed~~ heed RSS Pooh's warning. Tr. pp. 212-21.

Applicant's friend and codefendant, Diego Thompson testified he knew Applicant from school and from seeing Applicant at the Bethel Bishop Apartments, where Applicant's grandmother lived. Although Thompson denied being in a gang, he admitted he knew a number of gang members. Thompson testified Applicant was a member of the Folk Nation gang. Close to dark on the night of the murders, while Thompson was on his way home, he ran into Applicant at Bethel Bishop. Applicant told Thompson he had to "handle something" on T.S. Martin. Tr. pp. 258-63. Unaware Applicant had a gun, Thompson agreed to go with Applicant to the neighborhood. Applicant, Goo, and Thompson met up with two other associates, known as Ty and Little Chris, as they were walking. These two also agreed to go to T.S. Martin with Applicant. While the group was still in Bethel Bishop Apartments, Pooh once again warned Applicant to be careful "because they had pulled some guns on some Bloods." Along the way to T.S. Martin, Thompson saw Applicant put a black bandanna, or "flag," around his neck. According to Thompson, this indicated Applicant was "repping his set," or representing the gang, Insane Gangster Disciples, which is part of Folk Nation. Tr. pp. 263-69.

Once they reached T.S. Martin Drive, Little Chris asked a "little boy" who was sitting on the porch of a nearby house if the boy was a "Slob," which is a disrespectful term for Bloods. The boy replied there was not any gangbanging around there, and he went to a telephone. Thompson told Applicant they should go because the boy was either calling the police or other boys to come over. Applicant said that was what he wanted [the boy] to do. At this point, according to Thompson, Applicant pulled a .22 caliber rifle from his pants leg. Goo, who was standing next to Applicant, was armed with a shotgun. Thompson and the others were a slight distance away from the two with the guns. Tr. pp. 269-72.

Thompson said, "it's time for us to go," and he started to back away. Applicant then pointed the gun at the house where the boy had been. Applicant told Goo in sign language to shoot at the house. As Thompson and the others began running away, Thompson heard "six or seven gunshots." When Thompson briefly turned around, he saw Applicant throw the rifle down and pick up the shotgun. However, no other shots were fired. Thompson continued running from the scene, as did everyone else in the group who had gone to T.S. Martin, with the exception of Applicant. Thompson testified Applicant eventually followed and disposed of his weapon near the gate to the Colony Apartments. Tr. pp. 273-78.

Shante Bethel testified she was also a member of Folk Nation. On the night of August 26, 2004, she saw Applicant and Pooh at the Bethel Bishop Apartments. According to her, Applicant said he was going to T.S. Martin "to go ride with some Slobs." She thereafter saw Applicant leave Bethel Bishop Apartments with Goo, Diego Thompson, and another man she identified as "Mirage." Tr. pp. 415-19. A little later, she saw Applicant return to the Bethel Bishop at "full speed." She overheard Applicant tell a man there that he and the others had just left a shooting at T.S. Martin, "that they were spraying" the gunfire, and two little kids were shot. Applicant

also said they had done it because "they had gotten in something with some Bloods" earlier in the evening. After this conversation, Applicant ran to the Bayberry Apartments, taking a "cut" near the apartment complex. Tr. pp. 420-23.

Tyrone Smith testified he had known Applicant for about seven years at the time of the shooting. Smith was living on T.S. Martin Drive with his aunt and cousins at the time. Smith saw Applicant talking to Smith's friend Delshawn at the Bayberry Apartments, on the afternoon of August 26, 2004. According to Smith, Delshawn was a member of the Bloods. Smith and Delshawn eventually went to Smith's residence.[4] Smith testified Delshawn left shortly after 9:00 p.m. to go home. Tr. pp. 751-57.

Smith testified the trouble began after Delshawn left. Smith received a call from C.D., who told him "some boys had come to her and asked where the Slobs stayed." Smith later saw two males get out of a white car. One went to a house two doors away from him. However, the other male, whose face was partially covered by a black bandanna, approached Smith on his aunt's porch. This man pointed a gun at him and said, "I'll kill you." When this person turned around after realizing Smith was not Delshawn, Smith ran into the house and called the police. Tr. pp. 757-59.

Smith testified the white car was gone by the time the police arrived. After the police were informed of the incident and left to speak with Delshawn, Smith went back out onto the porch of his home with his two female cousins and another girl. He then saw Applicant and four other males walking up the street. Applicant's face was not obscured by a bandanna, although the other males were wearing bandannas. Smith and the girls immediately ran into the house and turned off the lights. Smith ran upstairs and looked out of "the left-hand window." Tr. pp. 759-62.

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[4] Both of Delshawn's sisters lived on the same block of T.S Martin as Smith. Tr. p. 756.

From there, Smith saw Applicant get a long, dark rifle from someone and hand another person a revolver. One gun was pointed at C.D. 's house. Applicant kneeled, aimed at the same house, and opened fire. He continued shooting after he stood up again. Smith testified that he heard multiple gunshots.[5] The people who were with Applicant ran back the same direction from which they had come as soon as Applicant began shooting. Smith testified Applicant tried to re-cock his weapon but a bullet did not "come up," so he turned and ran away from the scene. In all, Smith looked out the window for four or five minutes. Tr. pp. 762-65, 770-74.

The police returned to Smith's house, and Smith gave a statement concerning the shooting to Investigator Joe Gray of the City of Columbia Police Department. Smith's statement identified Applicant as the shooter by his nickname, Baby Jesus. Minutes later, Investigator Gray told Smith the police had caught someone going through a "cut" nearby. Investigator Gray then drove Smith to the location. Smith remained in Gray's car while another officer brought Applicant to the front of Gray's vehicle. Although it was dark outside, both police vehicles at the show-up had their lights on, and Investigator Gray testified his high beams were on. Also, the other officer shined alight on Applicant's face. Smith immediately identified Applicant as the shooter. Tr. pp. 498-99, 507-08, 512-15, 766-68.

Applicant gave two statements to Investigator Gray following his arrest. The waiver of rights for his first statement was signed at 12:17 a.m. on August 27, 2004. Applicant initially denied being at T.S. Martin. When Investigator Gray told him the police had witness information putting him there at the time of the shooting, however, Applicant admitted he had been there with "Ty and Chris from Belvedere" and two of their friends. Still, Applicant

[5] One of Smith's cousins dialed 911 during the incident. Tr. p. 764.

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claimed one of the other men in the groups had done the shooting. According to Applicant, this person used a sawed-off gun with a scope on it. Applicant also told Gray a person named O.B. had a dispute with Delshawn. Tr. pp. 528-40.

Roughly twelve hours later, following the victims' deaths, Investigator Gray again spoke to Applicant. After serving arrest warrants for murder on Applicant and obtaining a waiver of rights, Gray told Applicant he had some questions about the shooting that needed to be cleared up. Applicant again waived his rights and gave another statement. Tr. pp. 543-45.

In this second statement, given at 1:25 p.m. on August 27, Applicant admitted he had been shooting a .32 caliber automatic rifle when the incident occurred at T.S. Martin, but he claimed he only had two bullets. Applicant also said he had shot at a "top window [of a house] with a round hole like an attic." The other person was shooting "down the street in the dark." Further, Applicant claimed he had returned the .32 weapon to the person who handed it to him, and he denied that Goo, Diego Thompson, or Pooh had been present at the time of the shooting. Officers returned to the scene but could not find damage to any house other than C.D. 's, including a nearby house resembling the one Applicant described. Tr. pp. 547-52.

Finally, the State presented two experts in gang recognition who gave expert opinion testimony about the significance of the two teardrop tattoos Applicant put on his face after his arrest for the murders. Investigator Edward O'Cain, an expert in gang activity and gang recognition, testified he had viewed the two teardrop tattoos on Applicant face, "right [below] the right eye." One of these is an open teardrop. O'Cain opined this tattoo "can represent quite a few things depending on who you're talking to." Under gang rules, however, it is supposed to signify a "family member" – whether a fellow gang member, a relative, or an innocent person – has died. The other teardrop was filled in, and according to O'Cain, this means the

wearer has killed someone in retribution. It can, however, have some other meanings. Tr. pp. 902-53.

Officer Walter Mahoney, of the City of Columbia Police Department's gang task force, testified as an expert in gangs in the Columbia area. In his expert opinion, "[t]he open teardrop could represent a lost soldier, [or fellow gang member,] or... some innocent person that might have been killed by mistake. The closed teardrop is the body." According to Mahoney, Applicant's tattoos signify "[h]e is a gang member that took somebody out." (Sic) Tr. p. 954-75.

ALLEGATIONS

At the evidentiary hearing, Counsel for Applicant clarified that the December 11, 2018, amendments were meant to supersede the allegations contained in the original application and all other amendments. Applicant ultimately went forward only on the following allegations contained in the amended application filed December 11, 2018:

1. Ineffective Assistance of Trial Counsel, in that:
    a. Trial Counsel failed to conduct a reasonable investigation and to develop all available, relevant, and admissible mitigating evidence in preparation for trial. . . . Specifically, Trial Counsel failed to consult with an expert witness for an independent review of the eye-witness identification evidence implicating Applicant as the murderer when it was reasonable and necessary;
    b. Trial Counsel improperly argued irrelevant and highly prejudicial character evidence during the Applicant's opening statement by telling the jurors that Applicant had been incarcerated for twenty-six months prior to his jury trial;
    c. Trial Counsel failed to move for suppression of objectively false evidence that Applicant stole the gun that was used in the murders, resulting in Trial Counsel having to introduce otherwise inadmissible, irrelevant, and highly prejudicial character evidence that Applicant was incarcerated when the gun used during the homicide was stolen;
    d. Trial Counsel failed to object to improper and highly prejudicial testimony by witness, Tyrone Smith, that he was scared to testify but was testifying for the victims and their family;
    e. Trial Counsel failed to object to the admissibility of any testimony, by either lay or expert witnesses, that Applicant was a member of a gang, when such evidence was not relevant to the State's case and was inadmissible, unduly prejudicial character evidence;

f. Trial Counsel failed to object to the admissibility of the State's gang expert witness testimony;
g. Trial Counsel failed to preserve for appellate review objects to highly prejudicial testimony of the State's gang expert witnesses, including by not limited to testimony about possible meanings of the teardrop tattoos and hash mark tattoos;
h. Trial Counsel improperly called an expert witness to testify about gangs, including the possible meaning of tattoos, when it only served to bolster the credibility of the State's gang expert witnesses and enhance the State's improper and highly prejudicial evidence;
i. Trial Counsel failed to object to the Solicitor's improper comments during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Specifically, Trial Counsel failed to object when the Solicitor argued in closing, "There is not a single witness, or any evidence in this case, that points to anyone other than [Applicant] as being the shooter, the murderer." This unduly prejudicial argument was both burden shifting and an impermissible a comment on the Applicant's right not to testify;
j. Trial Counsel failed to call an expert witness to testify in rebuttal of the eye-witness identification evidence presented by the State at trial when it was reasonable and necessary to present this critical evidence;
k. Trial Counsel failed to object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors (sic). . . .;
l. Trial Counsel failed to object to improper and highly prejudicial testimony by a State's witness that he was scared to testify but was testifying for the victims and their family.

2. Ineffective Assistance of Appellate Counsel, in that:
   a. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the testimony of the State's gang expert witness was entirely inadmissible;
   b. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of the teardrop tattoos was inadmissible;
   c. Appellate Counsel failed to argue on appeal before the S.C. Court of Appeals that the State's gang experts' opinion about the possible meaning of the hash mark tattoos was preserved for appellate review;
   d. Appellate Counsel failed to appeal the portion of the S.C. Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

Applicant added two more allegations regarding trial counsel's performance prior to the start of the hearing:

1. Trial Counsel failed to object to improper vouching and bolstering of two witnesses, Shante Bethel and Diego Thompson, during the State's closing argument;
2. Trial Counsel failed to object when the State presented improper Golden Rule and burden-shifting arguments during closing arguments.

The Court therefore finds any other allegations other than those set forth by Applicant's counsel on the record at the start of the evidentiary hearing are waived and abandoned, including any allegations raised in the original application and previous amendments.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

As to the remaining allegations of ineffective assistance of trial and appellate counsel, this Court finds they are without merit. This Court has had the opportunity to review the record in its entirety and has heard the testimony at the PCR hearing. Set forth below are the relevant findings of facts and conclusions of law as required pursuant to S.C. Code Ann. §17-27-80 (2003).

In a PCR action, an applicant bears the burden of proving the allegations in his application. Butler v. State, 286 S.C. 441, 334 S.E.2d 813 (1985). Where the application alleges ineffective assistance of counsel as a ground for relief, Applicant must prove "counsel's conduct so undermined the proper functioning of the adversarial process that [it] cannot be relied upon as having produced a just result." Strickland v. Washington, 466 U.S. 668 (1984); Butler, 286 S.C. at 442, 334 S.E.2d at 814.

In evaluating allegations of ineffective assistance of counsel, the reviewing court applies the two-pronged test outlined in Strickland. First, Applicant must prove counsel's performance was deficient. Id.; Cherry v. State, 300 S.C. 115, 117, 386 S.E.2d 624, 625 (1989). Under this prong, the court measures an attorney's performance by its "reasonableness under prevailing professional norms." Cherry, 300 S.C. at 117, 386 S.E.2d at 625 (quoting Strickland, 466 U.S. at 690). The proper measure of performance is whether the attorney provided representation within the range of competence required in criminal cases. Butler, 286 S.C. at 442, 334 S.E.2d at 814. "Counsel is strongly presumed to have rendered adequate assistance and made all significant

decisions in the exercise of reasonable professional judgment." Id. (citing Strickland, 466 U.S. at 690). Applicant must overcome this presumption to receive relief. Cherry, 300 S.C. at 118, 386 S.E.2d at 625. Second, counsel's deficient performance must have prejudiced Applicant such that "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different." Id. at 117-18, 386 S.E.2d at 625.

Applicant also alleges ineffective assistance of appellate counsel. A defendant is entitled to effective assistance of appellate counsel. Southerland v. State, 337 S.C. 610, 615, 524 S.E.2d 833, 836 (1999). Although appellate counsel is required to provide effective assistance of counsel, "appellate counsel is **not** required to raise every non-frivolous issue that is presented by the record." Thrift v. State, 302 S.C. 535, 539, 397 S.E.2d 523, 526 (1990) (citing Jones v. Barnes, 463 U.S. 745 (1983)) (emphasis added). "For judges to second-guess reasonable professional judgments and impose on ... counsel a duty to raise every 'colorable' claim suggested by a client would disserve the very goal of vigorous and effective advocacy. . . ." Tisdale v. State, 357 S.C. 474, 476, 594 S.E.2d 166, 167 (2004) (citing Jones, 463 U.S. at 754). Where the strategic decision to exclude certain issues on appeal is based on reasonable professional judgment, the failure to appeal all trial errors is not ineffective assistance of counsel. Griffin v. Aiken, 775 F.2d 1226 (4th Cir. 1985).

Generally, in analyzing a claim of ineffective assistance of appellate counsel, the Court applies the Strickland test just as it would when analyzing a claim of ineffective assistance of trial counsel. See Southerland, 337 S.C. at 616, 524 S.E.2d at 836 (1999). Thus, in this case, we ask first whether appellate counsel's performance was deficient, and two, whether Applicant was prejudiced by appellate counsel's deficient performance. Bennett v. State, 383 S.C. 303, 309, 680 S.E.2d 273, 276 (2009). To prove prejudice, an applicant must show that, but for appellate

counsel's errors, there is a reasonable probability he would have prevailed on appeal. Anderson v. State, 354 S.C. 431, 434, 581 S.E.2d 834, 835 (2003).

I. Allegations 1(a), (j): Failure to consult with and call at trial an expert in eyewitness identification

Applicant alleges his trial counsels were deficient for failing to consult with an expert on eyewitness identification and for failing to call such an expert to rebut testimony presented by the State. In support of this claim, Applicant presented the testimony of Dr. Dawn McQuiston (McQuiston), Ph. D., who was qualified as an expert in memory and eyewitness identification.

McQuiston testified generally to issues that may be present regarding memory and eyewitness identifications. According to McQuiston, memory decays over time, and people's limited ability for attention can lead to errors in perception which contribute to misidentifications. McQuiston also testified there is scientific data to show misidentification occurs, although she could not say whether it was a "common" occurrence. McQuiston also testified familiarity between the subject and the person making the identification does not necessarily make an identification more accurate, nor does a person's confidence in the identification, although there is some relationship between confidence in the identification and its accuracy. Finally, McQuiston testified an identification from a lineup is more reliable than a show-up identification. Both McQuiston and Franklin-Best opined McQuiston's testimony may have been helpful at trial to help the jurors better understand all of the issues surrounding eyewitness identifications. Franklin-Best testified although she was aware of the ability to secure forensic experts for the defense, she did not consider hiring an expert on this particular issue.

However, McQuiston admitted she could not testify as to the reliability of the specific identification in this case, nor was she in any better position to say if this particular identification

was accurate than the jurors were at trial. In this case, the witness, Tyrone Smith, identified Applicant by his nickname, Baby Jesus, before officers even knew a suspect had been detained and before the show up occurred. Tr. p. 768. Further, although there were some issues with the identification, such as the suggestiveness of the show-up procedure, trial counsel pointed out these issues on cross-examination. Additionally, Thompson testified he was part of the group that traveled to T.S. Martin on the night of the shooting, identified Applicant as the shooter, and Applicant's own statement to law enforcement acknowledges he was at the scene and firing a gun. Tr. pp. 265-76.

"Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. "It is all too tempting for a defendant to second-guess counsel's assistance after conviction or adverse sentence, and it is all too easy for a court, examining counsel's defense after it has proved unsuccessful, to conclude that a particular act or omission of counsel was unreasonable. A fair assessment of attorney performance requires that every effort be made to eliminate the distorting effects of hindsight, to reconstruct the circumstances of counsel's challenged conduct, and to evaluate the conduct from counsel's perspective at the time." Id. at 689. Further, "while the Constitution requires that a criminal defendant receive effective assistance of counsel, the presentation of expert testimony is not necessarily an essential ingredient of a reasonably competent defense." Bonin v. Calderon, 59 F.3d 815, 834 (9th Cir. 1995). Counsel's failure to procure expert witnesses does not render his or her representation deficient when counsel vigorously cross-examines the State's witnesses and attacks the accuracy of the evidence. Lorenzen v. State, 376 S.C. 521, 531, 657 S.E.2d 771, 777 (2008).

In this case, the Court finds Counsel vigorously cross-examined the witnesses Tyrone Smith and ~~Deigo~~ Diego RSS Thompson regarding their assertions Applicant was the shooter. Tr. pp. 287-358, 777-824. Applicant's trial counsel also argued the show up was suggestive, Smith's inconsistent statements regarding his prior familiarity with Applicant, and the distance from which Smith viewed the shooting all called the identification into question. Despite Franklin-Best's second-guessing of her own performance in hindsight, her decision not to consult with or call an expert on this issue did not render her representation of Applicant constitutionally deficient, as she was able to attack the credibility of the identification in various other ways. See Wright v. Hopper, 169 F.3d 695, 707 (11th Cir. 1999) ("The question of ineffectiveness is a question for the court to decide so admissions of defective performance by attorneys are not decisive.").

Finally, "[a]n error by counsel, even if professionally unreasonable, does not warrant setting aside the judgment of a criminal proceeding if the error had no effect on the judgment." Strickland, 466 U.S. at 691. To establish prejudice, Applicant is required to show "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different. A reasonable probability is a probability sufficient to undermine confidence in the outcome." Id. at 694. The Court finds there was significant evidence in the case supporting the reliability of this particular identification of Applicant by Tyrone Smith, which could not be overcome by McQuiston's testimony since she was unable to comment on the reliability of this particular identification. Therefore, the Court finds Applicant has failed to meet his burden of proving he was prejudiced by Franklin-Best's alleged deficiency.

Accordingly, because Applicant cannot prove either deficiency or prejudice regard to the expert witness issue, these allegations shall be denied and dismissed.

II. Allegation 1(b): Introduction of irrelevant, improper, and highly prejudicial character evidence by trial counsel during Applicant's opening statement

Applicant argues trial counsel was ineffective by telling the jurors Applicant had been incarcerated for twenty-six months prior to his jury trial in the defense's opening statement. The attorney who gave the opening, Maxwell Shardt, was unavailable to testify at the evidentiary hearing, and Franklin-Best testified she was not aware he was going to make such an argument beforehand. However, the Court has reviewed the record and finds, in the context of the opening as a whole, as well as the defense's overall strategy of point the finger at Diego Thompson, there is sufficient basis to conclude Shardt's decision was a strategic one.

"Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. There is a strong presumption that counsel's decisions are based on tactical strategy rather than neglect. Yarborough v. Gentry, 540 U.S. 1, 8 (2003) (quoting Massaro v. United States, 538 U.S. 500 (2003)). When counsel articulates valid reasons for employing certain strategy, such conduct will not be deemed ineffective assistance of counsel. Stokes v. State, 308 S.C. 546, 419 S.E.2d 778 (1992); Ingle v. State, 348 S.C. 467, 470, 560 S.E.2d 401, 402 (2002) (holding counsel may avoid a finding of ineffectiveness if he articulates a valid reason for using a certain strategy). However, courts should not "insist counsel confirm every aspect of the strategic basis for his or her actions." Harrington v. Richter, 562 U.S. 86, 109 (2011).

Here, Schardt stated during his opening Applicant had been in jail for twenty-six months, and it was public knowledge Applicant "was [the State's] guy," and law enforcement had been focused on him that entire time, rather than following the evidence. Tr. pp. 117-18. Schardt concluded by telling the jury Applicant had been waiting for twenty-six months for them to send

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him home. Tr. p. 130. It is clear from a full reading of the opening statement and from the record as a whole, Schardt was arguing the police investigation was deficient because they had jumped to the conclusion Applicant was the perpetrator and pursued that theory, rather than letting the evidence tell them what to do or what avenues to pursue. It is also clear Schardt was making this argument in order to point to Applicant's innocence, rather than his guilt.

Judicial scrutiny of counsel's performance must be highly deferential. Strickland, 466 U.S. at 689. "Because of the difficulties inherent in making the evaluation, a court must indulge a strong presumption that counsel's conduct falls within the wide range of reasonable professional assistance; that is, the defendant must overcome the presumption that, under the circumstances, the challenged action might be considered sound trial strategy." Id. Where, as here, a strategic basis can be deduced from the record, trial counsel's performance should not be held deficient, and this Court so finds. Accordingly, this allegation shall be denied and dismissed.

III. Allegation 1(c): Failure to object to allegedly improper testimony regarding the gun used in the homicide

Applicant alleges trial counsel failed to object when the State presented evidence showing the gun used in the homicide had been stolen because Applicant was in jail during the timeframe of the theft, and refuting such evidence required the defense to present otherwise inadmissible evidence implicating Applicant's character. As an initial matter, this Court finds to the extent Applicant is arguing the introduction of this evidence constituted prosecutorial misconduct, that allegation was not properly plead, and relief should not be granted on that ground. Instead, Applicant has framed the issue as one of ineffective assistance of trial counsel for failing to object. For the reasons discussed below, the Court finds Applicant has not met his burden of proof as to either deficiency on this issue.

Applicant asserts this evidence was "highly prejudicial" because it required the defense to admit evidence showing Applicant was in jail at the time of the theft. However, contrary to Applicant's description of this evidence as harmful to his case, it was instead beneficial and consistent with the defense theory, as testified to by Franklin-Best, the shooter was not Applicant, but was actually Diego Thompson. The evidence showing Applicant was in jail at the time of the gun theft refuted Thompson's testimony Applicant stole the gun, putting Thompson's credibility in doubt. The State's lead investigator agreed the identity of the person who stole the gun was important to the murder investigation, and law enforcement knew it could not have been Applicant. Tr. p. 1338. The defense was then able to argue in closing the State had not tied the gun to Applicant, and that fact, along with the fact the gun was not found where Thompson said it was or anywhere near where Applicant was arrested, was evidence Thompson was the shooter rather than Applicant. Thus, because the introduction of this evidence was consistent with the defense theory, this Court finds Applicant's trial counsels were not deficient for introducing it, nor was it prejudicial to Applicant's defense. This allegation shall be denied and dismissed.

IV. Allegations 1(d), (l): Failure to object to testimony by the witness Tyrone Smith that he was scared to testify but was testifying for the victims and their family

Applicant alleges his counsels were ineffective for failing to object when Tyrone Smith testified he was "scared to be on TV," but was nevertheless testifying for the victims and their families. Tr. pp. 775-76. The Court finds Applicant has failed to meet his burden of proof as to this allegation.

In the exchange at issue, Smith stated he was comfortable with testifying because there were no cameras in the courtroom and his concern was being on television, because Applicant "is a brother." Tr. p. 775. Franklin-Best testified she should have objected because this testimony was bolstering and impermissible character evidence. However, Applicant's gang affiliation was

uncontested at trial. Further, Smith never testified he was afraid of Applicant himself or that Applicant or anyone affiliated with Applicant had threatened him. Smith's testimony implies he is afraid of *other* community members who might see him on television, not Applicant. Finally, this Court's review of the record reveals the reference to Smith being afraid was fleeting, comprising seventeen lines in a transcript of more than one-thousand pages.

This Court finds Applicant has failed to meet his burden as to deficiency because the comments were not objectionable. In any event, to establish prejudice, Applicant is required to show "there is a reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different. A reasonable probability is a probability sufficient to undermine confidence in the outcome." Strickland, 466 U.S. at 694. Applicant did not present any evidence, other than mere speculation, regarding the impact of this testimony. See, e.g., Bannister v. State, 333 S.C. 298, 303, 509 S.E.2d 807, 809 (1998) ("This Court has repeatedly held a PCR applicant must produce the testimony of a favorable witness or otherwise offer the testimony in accordance with the rules of evidence at the PCR hearing in order to establish prejudice. . . ."). Further, as noted above, Applicant's gang affiliation was not a contested issue at trial. Accordingly, the Court finds Applicant's presentation on this issue was insufficient to meet his burden of proof as to the prejudice prong. Therefore, these allegations shall be denied and dismissed.

V. Allegations 1(e) -(h), (k): Failure to object to or otherwise preserve for appellate review testimony from the State's witnesses regarding to Applicant's gang affiliation and the possible meaning of Applicant's tattoos; failure to properly rebut the State's expert witness testimony regarding the meaning of the tattoos

First, Applicant contends evidence of his gang affiliation was "irrelevant" and "highly prejudicial." In fact, the entire theory of the State's case was based on this shooting being a gang-related retaliation; thus, the Court finds Applicant's membership in the Folk Nation gang

was clearly relevant. Additionally, this Court's review of the record reveals Applicant's counsel objected to the testimony of the State's expert witnesses on multiple bases, in both the pre-trial motion hearing and at trial. Therefore, for the reasons set forth below, this Court finds Applicant has failed to meet his burden of either deficiency or prejudice regarding these allegations.

The defense's primary objection to the tattoo testimony was that the State was unable to establish what the tattoos meant to Applicant, specifically. Tr. p. 19. The defense also argued the testimony was improper "propensity" evidence, overly prejudicial, and based on inadmissible hearsay. Pre-Trial Tr. pp. 5-9, 112-17; Tr. pp. 12-24, 901. Although these initial objections were overruled, Franklin-Best made multiple motions for a mistrial based on the testimony actually elicited, arguing the portion of the experts' testimony attributing "bodies" to the tattoos was "inflammatory," irrelevant, based on hearsay which violated Applicant's rights under the Confrontation Clause, and was improper "propensity" evidence. Tr. pp. 919-24, 971-73. Thus, the Court finds it is clear from the record defense counsel did a capable job of fighting the admission of this testimony on multiple grounds.

However, Franklin-Best testified at the evidentiary hearing she should have objected based on character, and she should have argued the evidence did not meet the Council test for admissibility. State v. Council, 335 S.C. 1, 515 S.E.2d 508 (1999) (holding when admitting scientific evidence, the trial judge must find the evidence will assist the trier of fact, the expert is qualified, and the evidence is reliable). However, Council applies to scientific evidence, and at the time of Applicant's trial, was not the standard for non-scientific expert testimony, which was governed instead by State v. Morgan, 326 S.C. 503, 485 S.E.2d 112 (Ct. App. 1997). The Court finds the testimony at issue here was much like that at issue in Morgan, in that it was not based on rigorous scientific data and testing, but instead on the observations and experience of the

testifying experts. In those instances, Morgan instructed the reliability of the expert testimony went to the weight of the evidence, not its admissibility. 326 S.C. at 513, 485 S.E.2d at 118. Morgan was not overruled until 2009, thus it was the law at the time of Applicant's trial, and any argument for use of the Council standard would have been incorrect. Therefore, this Court finds Franklin-Best was not deficient for failing to object to on that ground.

Additionally, Applicant's appellate counsel raised the issue of the expert testimony regarding "bodies" being attributed to the tattoos on appeal. Although the Court of Appeals found it was not preserved as to the character evidence argument, it nevertheless addressed the issue on the merits, finding any error in the admission of such evidence harmless given the eyewitness identifications of Applicant as the shooter and Applicant's own incriminating statement. State v. Liverman, 398 S.C. 130, 727 S.E.2d 422 (2012).

An issue raised on direct appeal but found to be unpreserved may be raised in the context of a post-conviction relief claim alleging ineffective assistance of counsel. McHam v. State, 404 S.C. 465, 475, 746 S.E.2d 41, 47 (2013) (citing McLaughlin v. State, 352 S.C. 476, 575 S.E.2d 841 (2003); Foye v. State, 335 S.C. 586, 518 S.E.2d 265 (1999)). However, to be entitled to relief on such a claim, an applicant must establish the underlying claim is meritorious and would have resulted in a reversal on appeal to a reasonable probability. McHam, 404 S.C. at 475-76, 746 S.E.2d at 47 ("Since the Fourth Amendment issue was not considered on direct appeal because it was unpreserved, an examination of the merits of the issue is appropriate in analyzing the prejudice prong in McHam's PCR claim."). Therefore, before this Court can grant relief on a claim of ineffective assistance of trial counsel for failing to preserve a ground for appellate review, the Court must determine the underlying claim was meritorious and a reasonable probability that it would have resulted in reversal and a new trial. Here, the Court of Appeals

explicitly found the admission of the gang expert testimony was harmless, and therefore, this Court finds Applicant has not met his burden of proof as to the prejudice prong.

Finally, Applicant also argues Franklin-Best was deficient in calling a defense expert (Walker) regarding the tattoos when his testimony only served to reinforce the opinions of the State's experts. However, the Court finds this characterization of Walker's testimony is not supported by the record. Walker had extensive law enforcement credentials, and testified there were multiple possible meanings for the teardrop tattoos other than signifying "bodies," including that a friend or family member had died, serving time, or simply being a copycat. Tr. pp. 1164, 1169. He also pointed to multiple celebrities with teardrop tattoos including the rapper Lil Wayne and the basketball player Larry Hughes. Tr. p. 1196. Walker also testified the hash mark tattoos signified rank within the gang, not "bodies." Tr. p. 1173. Finally, Walker helped build the defense's argument that no expert could say definitively say what the tattoos meant, as only Applicant would know. Tr. pp. 1174-75.

"Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690. There is a strong presumption that counsel's decisions are based on tactical strategy rather than neglect. Yarborough v. Gentry, 540 U.S. 1, 8 (2003) (quoting Massaro v. United States, 538 U.S. 500 (2003)). "Accordingly, when counsel articulates a valid reason for employing a certain strategy, such conduct will not be deemed ineffective assistance of counsel." Smith v. State, 386 S.C. 562, 567, 689 S.E.2d 629, 632 (2010) (citing Caprood v. State, 338 S.C. 103, 110, 525 S.E.2d 514, 517 (2000)). See also Stokes v. State, 308 S.C. 546, 419 S.E.2d 778 (1992) (holding where counsel articulates valid reasons for employing certain strategy, such

conduct will not be deemed ineffective assistance of counsel); Ingle v. State, 348 S.C. 467, 470, 560 S.E.2d 401, 402 (2002) (holding counsel may avoid a finding of ineffectiveness if he articulates a valid reason for using a certain strategy). The Court finds calling Walker as a defense witness was a reasonable strategic decision to counter the presentation of the State's expert witnesses, and therefore, this Court finds Applicant's trial counsel were not deficient in doing so.

Because Applicant has shown neither deficiency nor prejudice regarding the defense's handling of the various expert witnesses' testimony, these allegations shall be denied and dismissed.

VI. Allegation 1(i): Failure to object to various improper comments during the State's closing argument; failure to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments

Applicant alleges his trial counsel should have objected to the solicitor's argument in closing, "There is not a single witness, or any evidence in this case, that points to anyone other than [Applicant] as being the shooter, the murderer." Tr. p. 1319. Applicant contends this argument was both burden shifting and an impermissible ~~a~~ RCS comment on the Applicant's right not to testify. Applicant also alleges trial counsel should have objected to improper vouching and bolstering of two witnesses, Shante Bethel and Diego Thompson, and to improper Golden Rule and burden-shifting arguments during the State's closing. Tr. pp. 1319-20, 1392.

"A solicitor's closing argument must be carefully tailored so as not to appeal to the personal biases of the jury." Von Dohlen v. State, 360 S.C. 598, 609, 602 S.E.2d 738, 744 (2004). "The argument must not be calculated to arouse the jurors' passions or prejudices, and its content should stay within the record and reasonable inferences that may be drawn therefrom." Id. at 609-10, 602 S.E.2d at 744. "If a solicitor's closing argument remains within the record

evidence and the reasonable inferences therefrom, no error occurs. Undoubtedly, a solicitor may argue the State's version of the testimony presented, and furthermore may comment on the weight to be accorded such testimony." State v. New, 338 S.C. 313, 319, 526 S.E.2d 237, 240 (Ct. App. 1999) (internal citations omitted). However, "[i]mproper comments do not automatically require reversal if they are not prejudicial to the defendant, and the [defendant] has the burden of proving he did not receive a fair trial because of the alleged improper argument." Humphries v. State, 351 S.C. 362, 373, 570 S.E.2d 160, 166 (2002). "The relevant question is whether the solicitor's comments so infected the trial with unfairness as to make the resulting conviction a denial of due process." Id.

This Court has reviewed the relevant portions of the trial record and finds the solicitor's statement that there were no witnesses or evidence pointing to anyone other than Applicant as the shooter is within the bounds of permissible argument. The solicitor did not argue "the defendant" or "the defense" had failed to present such evidence; she was merely commenting on her view of the all the evidence presented at trial. Tr. p. 1319. The Court finds this is a permissible comment for a solicitor to make, as the State has a right to argue its version of the facts and credibility of the evidence. Further, the defense called Diego Thompson and Shante Bethel "liars" during closing, which put their credibility in issue before the jury, as it always is, and the State had a right to respond to the defense's characterization of those witnesses. Tr. p. 1337. Accordingly, because the comments were not objectionable, the Court finds trial counsel were not deficient for failing to object.

Further, this Court finds none of the comments at issue in this case were so prejudicial as to amount to a denial of due process, particularly in the context of the whole trial. See State v. Rudd, 355 S.C. 543, 550, 586 S.E.2d 153, 157 (Ct. App. 2003) (appellate courts will review the

alleged impropriety of an opening or closing argument in the context of the entire record). In Smith v. State, 375 S.C. 507, 654 S.E.2d 523 (2007), abrogated on other grounds by Smalls v. State, 422 S.C. 174, 810 S.E.2d 836 (2018), the Supreme Court concluded any impropriety in the solicitor's closing argument was not sufficient to grant post-conviction relief where the solicitor's improper use of the pronoun "I" was limited, did not recur throughout his argument, there was overwhelming evidence of the defendant's guilt, and the trial judge instructed the jury not to consider counsels' statements as evidence. Similarly, the trial court in Applicant's case instructed the jury the attorneys would recount their recollections of the testimony, but if what the attorneys said differed from the jurors' own recollections, they were to rely on their own memories. Tr. p. 1298. He also instructed jurors it was their duty to judge the credibility of witnesses, and in doing so, they could consider whether a witness had exhibited any interest, any motive, any bias, or any prejudice in the case." Tr. pp. 1403-05. In this context of the closing arguments and jury instructions taken as a whole, the Court finds the solicitor's comments were not so prejudicial as to deprive Applicant of due process.

Therefore, because Applicant has failed to prove either deficiency or prejudice, these allegations shall be denied and dismissed.

VII. Allegation 2(a)-(d): Appellate Counsel was ineffective in his handling of the gang expert testimony on appeal

Applicant alleges appellate counsel was ineffective because he failed to argue before the Court of Appeals that the testimony of the State's gang expert witnesses was entirely inadmissible, failed to argue the State's gang experts' opinion about the possible meaning of the teardrop tattoos was inadmissible, failed to argue the State's gang experts' opinion about the possible meaning of the hash mark tattoos was preserved for appellate review, and failed to

appeal the portion of the Court of Appeals' Opinion regarding the admissibility of the State's gang expert witnesses' testimony to the S.C. Supreme Court.

As an initial matter, the Court finds the State has correctly pointed out Applicant has alleged both trial counsel was ineffective in failing to preserve these issues and appellate counsel was ineffective in failing to raise them. It cannot be both ways, as appellate counsel cannot be deficient for failing to raise an unpreserved issue. Legge v. State, 349 S.C. 222, 562 S.E.2d 618 (2002). Additionally, because Applicant did not present any testimony at the evidentiary hearing regarding appellate counsel's performance, this Court finds he is unable to overcome the presumption in favor of appellate counsel that appellate counsel's decisions regarding which issues to raise where based on strategy rather than neglect.

Although appellate counsel is required to provide effective assistance of counsel, "appellate counsel is **not** required to raise every non-frivolous issue that is presented by the record." Thrift v. State, 302 S.C. 535, 539, 397 S.E.2d 523, 526 (1990) (citing Jones v. Barnes, 463 U.S. 745 (1983)). "For judges to second-guess reasonable professional judgments and impose on. . . counsel a duty to raise every 'colorable' claim suggested by a client would disserve the very goal of vigorous and effective advocacy…." Tisdale v. State, 357 S.C. 474, 476, 594 S.E.2d 166, 167 (2004) (citing Jones, 463 U.S. at 754). Generally, in analyzing a claim of ineffective assistance of appellate counsel, the Court applies the Strickland test just as it would when analyzing a claim of ineffective assistance of trial counsel. See Southerland, 337 S.C. at 616, 524 S.E.2d at 836 (1999). Thus, in this case, we ask first whether appellate counsel's performance was deficient, and two, whether Applicant was prejudiced by appellate counsel's deficient performance. Bennett v. State, 383 S.C. 303, 309, 680 S.E.2d 273, 276 (2009). To prove prejudice, an applicant must show that, but for appellate counsel's errors, there is a

reasonable probability he would have prevailed on appeal. Anderson v. State, 354 S.C. 431, 434, 581 S.E.2d 834, 835 (2003).

In this instance, appellate counsel raised two claims, including the propriety of the gang expert testimony, and although that issue was found to be unpreserved, the Court of Appeals still considered the merits, finding its admission was harmless error. Appellate counsel then selected the show-up issue for further appeal to the Supreme Court. Because Applicant failed to present any testimony from appellate counsel on this issue, this Court finds Applicant cannot overcome the presumption the decision was based on strategy rather than neglect. See, e.g., Jones v. Barnes, 463 U.S. 745, 751-52 (1983) ("Experienced advocates since time beyond memory have emphasized the importance of winnowing out weaker arguments on appeal and focusing on one central issue if possible, or at most on a few key issues."). "Counsel's performance is accorded a favorable presumption, and a reviewing court proceeds from the rebuttable presumption that counsel 'rendered adequate assistance and made all significant decisions in the exercise of reasonable professional judgment.'" Strickland, 466 U.S. at 690.

Additionally, the Court finds it is not reasonably likely Applicant would have prevailed on these issues. Indeed, the Court of Appeals found the admission of the gang expert testimony was harmless. Such an assessment is not likely to change no matter which argument appellate counsel made for its inadmissibility. "Generally, only when ignored issues are clearly stronger than those presented, will the presumption of effective assistance of counsel be overcome." Smith v. Robbins, 528 U.S. 259, 288, 120 S. Ct. 746, 765, 145 L. Ed. 2d 756 (2000) (quoting Gray v. Greer, 800 F.2d 644, 646 (C.A.7 1986)). This Court finds Applicant has not met his burden of proving deficiency or prejudice. Therefore, this allegation shall be denied and dismissed.

CONCLUSION

Based on all the foregoing, this Court finds and concludes Applicant has not established any constitutional violations or deprivations that would require this court to grant his application. Counsel was not deficient in any manner, nor was Applicant prejudiced by his representation. Therefore, this application for post-conviction relief must be denied and dismissed with prejudice.

The Court notes Applicant must file and serve a notice of appeal within thirty days from PCR counsel's receipt of written notice of entry of judgment to secure the appropriate appellate review. See Rule 203, SCACR. Pursuant to Austin v. State, 305 S.C. 453, 409 S.E.2d 395 (1991), Applicant has a right to appellate counsel's assistance in seeking review of the denial of post-conviction relief. Rule 71.1(g), SCRCP, provides that if Applicant wishes to seek appellate review, PCR counsel must serve and file a notice of appeal on Applicant's behalf. Applicant is directed to South Carolina Appellate Court Rule 243 for appropriate procedures for appeal.

IT IS THEREFORE ORDERED:

1. the Application for Post-Conviction Relief is denied and dismissed with prejudice; and
2. Applicant shall be remanded to the custody of the Respondent.

AND IT IS SO ORDERED.

R. SCOTT SPROUSE
Presiding Circuit Court Judge
Fifth Judicial Circuit

4-15, 2019

COPY

THE STATE OF SOUTH CAROLINA)	IN THE COURT OF **COMMON PLEAS**
)	
COUNTY OF **RICHLAND**)	**FIFTH** JUDICIAL CIRCUIT
)	
Chris A. Liverman,)	Case No.: **2012CP4004870**
Applicant)	
)	
v.)	**MOTION TO ALTER OR AMEND PURSUANT TO RULE 59(E), SCRCP**
)	
State of South Carolina,)	
Respondent.)	

RICHLAND COUNTY FILED 2019 APR 30 AM 11:41 JEANETTE W. McBRIDE C.C.P., G.S. & F.C.

TO: The Honorable R. Scott Sprouse
Deputy Attorney General Ed Salter
Assistant Attorney General Lindsey McCallister

The Applicant, by and through the undersigned Counsel, moves this Court to alter or amend the "Order Denying Application for Post-Conviction Relief" (filed on April 23, 2019) pursuant to Rule 59(e) of the South Carolina Rules of Civil Procedure. *See Reese v. State*, (S.C. Sup. Ct. Order filed October 24, 2018) (Shearouse Adv. Sh. No. 42 at 9). Specifically, the Order of Dismissal does not contain specific findings of fact and conclusions of law regarding all the facts and claims presented at the evidentiary hearing and in Applicant's Memorandum in Support of Post-Conviction Relief (filed on February 12, 2019).

In support of this motion, Applicant submits the following arguments and does not abandon or waive any previous arguments or issues raised in the prior pleadings and evidentiary hearing in this PCR action:

(1) The procedure followed by this Court denied Applicant an opportunity to have his PCR claims adjudicated by an independent judicial officer in violation of the separation of powers doctrine. *See* S.C. Art. I, § 8. Specifically, the Court did not provide the State with any basis for denying Applicant's claims other than

delegating the responsibility of drafting a proposed order of dismissal. Respectfully, the Court impermissibly adopted a slightly modified version of the State's adversarial proposed Order Denying Post-Conviction Relief because this independent judicial function cannot be delegated to an executive agency without providing specific instructions and rationale for omitting findings of fact and/or denying each claim. *See Marlar v. State*, 375 S.C. 407, 408, 653 S.E.2d 266 (2007) (holding, "Pursuant to S.C. Code Ann. § 17-27-80 . . . , the PCR judge must make specific findings of fact and state expressly the conclusions of law relating to each issue presented.").

(2) Applicant incorporates by reference the Memorandum in Support of Post-Conviction Relief (filed on February 12, 2019) as if fully set forth verbatim into this motion. Notably, the facts and arguments contained in this memorandum necessitate the granting of post-conviction relief.

(3) The Order Denying Post-Conviction Relief fails to properly summarize all the testimony, which could be done by the State obtaining a copy of the evidentiary hearing transcript. Applicant is serving two life sentences and this PCR action is his best opportunity to seek the relief of a new trial. Therefore, fundamental fairness highlights the need to ensure the Court's Order contains all the relevant findings of fact and conclusions of law for the Court to conduct an objective and independent review and to preserve all issues for appellate review.

(4) The Order Denying Post-Conviction Relief fails to properly address Applicant's claim that Trial Counsel provided ineffective assistance of counsel by failing to object when the prosecutor argued in closing: (1) "There is not a single witness, or

any evidence in this case, that points to anyone other than [Applicant] as being the shooter, the murderer"; (2) "He sits there today bragging to you, to us, and to our community, that he did this"; (3) references to tattoos on Applicant's face; (4) juror's community, not gangs; (5) "My office, my job was to seek justice"; and (6) "We use the word truth". Tr. 1304, ll. 15-16; Tr. 1319, ll. 3-6; Tr. 1368 – 1374; Tr. 1392, l. 2 – 1393, l. 7. This unduly prejudicial argument was both burden shifting and an impermissible comment on Applicant's right not to testify. *See Humphries v. State*, 351 S.C. 362, 373, 570 S.E.2d 160, 166 (2002); *McFadden v. State*, 342 S.C. 637, 539 S.E.2d 391 (2000); *State v. Kennedy*, "272 S.C. 231, 250 S.E.2d 338 (1978) (finding curative instruction could not cure the prejudice to the defendant).

(5) The Order Denying Post-Conviction Relief fails to properly address Applicant's claim that Trial Counsel provided ineffective assistance of counsel by failing object to the Solicitor's improper comments vouching/bolstering the credibility of the State's witnesses during closing argument and failed to move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Tr. 1315; Tr. 1319, ll. 14-17; 1369, ll. 8-110; 1377, ll. 2-12; 1381, ll. 2-3. *See State v. Shuler,* 344 S.C. 604, 545 S.E.2d 805, *cert. denied,* 534 U.S. 977, 122 S.Ct. 404 (2001); *Gilchrist v. State*, 350 S.C. 221, 227, 565 S.E.2d 281, 285 (2002).

(6) The Order Denying Post-Conviction Relief fails to properly address Applicant's claim that Trial Counsel provided ineffective assistance of counsel by failing to object to the Solicitor's improper comments (references to the juror's community versus gang turf) in violation of the Golden Rule during closing argument and failed to

move for a curative instruction and/or mistrial based on the undue prejudice created by those comments. Tr. 1392, l. 15 – 1393, l. 30; *See Von Dohlen*, 360 S.C. at 611, 602 S.E.2d at 745; *State v. Reese*, 359 S.C. 260, 271, 597 S.E.2d 169, 175 (Ct. App. 2004).

(7) The Order Denying Post-Conviction Relief fails to properly address Applicant's claim that Trial Counsel provided ineffective assistance of counsel by failing to properly object to and preserve for appellate review lay opinion and expert testimony regarding unduly prejudicial gang affiliation evidence and stigma in the minds of the jurors. *See United States v. Santiago*, 643 F.3d 1007, 1011 (7th Cir. 2011); *United States v. Archuleta*, 737 F.3d 1287, 1295 (10th Cir. 2013), cert. denied, 134 S. Ct. 2859 (2014)

(8) Therefore, this Court should reconsider its Order Denying Post-Conviction Relief (filed on April 23, 2019), withdraw that order, enter an order granting Applicant post-conviction relief, and remand this case to the Court of General Sessions for a new trial.

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CONCLUSION

Based on the foregoing reasons, the undersigned Counsel respectfully requests that this Court reconsider the Order Denying Post-Conviction Relief by conducting an objective review of the facts and law based on the arguments presented by the parties, and independently entering an Order Granting Post-Conviction Relief. Rule 59(e), SCRCP; *See Strickland v. Washington*, 466 U.S. 668 (1984); U.S. Const. amends. V, VI, XIV; S.C. Const. art. I, §§ 3 and 14; *See* S.C. Code § 17-27-20(A)(1), (4), and (6).

IT IS SO MOVED.

Respectfully submitted,

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ATTORNEYS FOR THE APPLICANT

April 30, 2019

STATE OF SOUTH CAROLINA COUNTY OF RICHLAND	IN THE COURT OF COMMON PLEAS FIFTH JUDICIAL CIRCUIT
Chris A. Liverman, Applicant, v. State of South Carolina, Respondent.	Case No.: 2012-CP-40-04870 ORDER DENYING APPLICANT'S MOTION FOR RECONSIDERATION

RICHLAND COUNTY
FILED
2019 MAY 10 PM 2:15
JEANETTE W. GRANT
CLERK OF COURT

After careful consideration of the able argument and filings of Counsel and review of the record, the Court is unable to discover any material fact or principle of law that either has been overlooked or disregarded and further finds no error of law or fact not appropriately considered. Accordingly, the Plaintiff's Motion, pursuant to Rule 59, SCRCP, [1] is DENIED.

AND, IT IS SO ORDERED.

R. SCOTT SPROUSE
Judge, Tenth Judicial Circuit

Walhalla, South Carolina
May 8, 2019

[1] The Court, in its discretion, has determined this Motion on the filings, without oral argument, pursuant to Rule 59(f), SCRCP.

THE STATE OF SOUTH CAROLINA
In The Supreme Court

APPEAL FROM RICHLAND COUNTY
Court of Common Pleas

The Honorable R. Scott Sprouse, Circuit Court Judge

Case No. 2012-CP-40-04870

Chris A. Liverman,

Petitioner,

v.

State of South Carolina,

Respondent.

RICHLAND COUNTY
FILED
2019 MAY 21 AM 9:21
JEANETTE W. McBRIDE
CLERK OF COURT

NOTICE OF APPEAL

Chris A. Liverman appeals the Honorable R. Scott Sprouse's Order Denying Application for Post-Conviction relief filed on April 23, 2019 and the Court's Order Denying Applicant's Motion for Reconsideration (Rule 59(e), SCRCP) filed on **May 10, 2019**.

Dayne C. Phillips, Esq.
1614 Taylor Street, Suite D.
Columbia, SC 29201

May 17, 2019

ATTORNEY FOR PETITIONER

Other Counsel of Record:
Lindsey A. McCallister, Assistant Attorney General
South Carolina Attorney General's Office
1000 Assembly Street, Room 519
Columbia, SC 29201

cc:
Jeanette W. McBride, Richland County Clerk of Court
Chris A. Liverman (SCDC)

THE STATE OF SOUTH CAROLINA
In The Supreme Court

APPEAL FROM RICHLAND COUNTY
Court of Common Pleas

The Honorable R. Scott Sprouse, Circuit Court Judge

Case No. 2012-CP-40-04870

Chris A. Liverman,

Petitioner,

v.

State of South Carolina,

Respondent.

PROOF OF SERVICE

I certify that I have served the Notice of Appeal on Lindsey A. McCallister, Esq., the Honorable Jeanette W. McBride, and Chris A. Liverman, by depositing a copy in the United States Mail, postage prepaid, on May 17, 2019, addressed to the following parties:

Lindsey A. McCallister, Esquire, South Carolina Attorney General's Office
1000 Assembly Street, Room 519
Columbia, SC 29201

The Honorable Jeanette W. McBride, Richland County Clerk of Court
P.O. Box 2766, Columbia, SC 29202

Chris A. Liverman, Lee Correctional Institution,
990 Wisacky Highway, Bishopville, SC 29010

Courtney Powers
Paralegal for Dayne Phillips, Esq.
1614 Taylor Street, Suite D.
Columbia, SC 29201

May 17, 2019

ARREST WARRANT

H760156 H-760156 0427582

STATE OF SOUTH CAROLINA

☐ County/ ☒ Municipality of COLUMBIA

THE STATE

against

CHRIS A LIVERMAN

Address: [redacted]

COLUMBIA SC 00000

Phone: SSN:

Sex: M Race: B Height: 6 02 Weight: 180

DL S[redacted] DL#:

DOB: [redacted] Agency ORI#: SC0400100

Prosecuting Agency: CITY OF COLUMBIA

Prosecuting Officer: GRAY J/ROSS

Offense: MURDER

Offense Code: HOM

Code/Ordinance Sec. 16-3-10

This warrant is **CERTIFIED FOR SERVICE** in the ☐ County/ ☒ Municipality of COLUMBIA. The accused is to be arrested and brought before me to be dealt with according to law.

(L.S.)

Signature of Judge

Date: [redacted]

RETURN

A copy of this arrest warrant was delivered to defendant Chris Liverman on 08-27-04

J.C.S.

Signature of Constable/Law Enforcement Officer

RETURN WARRANT TO:

CITY OF COLUMBIA
MUNICIPAL COURT
P. O. BOX 644
COLUMBIA, S. C. 29202

STATE OF SOUTH CAROLINA

☐ County/ ☒ Municipality of COLUMBIA

AFFIDAVIT

Form Approved by S.C. Attorney General April 21, 2003 SCCA 618

Personally appeared before me the affiant J GRAY who being duly sworn deposes and says that defendant CHRIS A LIVERMAN did within this county and state on 08/26/2004 violate the criminal laws of the State of South Carolina (or ordinance of ☐ County/ ☒ Municipality of COLUMBIA) in the following particulars:

DESCRIPTION OF OFFENSE: MURDER 16-3-10

I further state that there is probable cause to believe that the defendant named above did commit the crime set forth and that probable cause is based on the following facts:

ON SAID DATE AT [redacted] T.S. MARTIN DRIVE, SIXTEEN YEAR OLD T.M. [redacted] WAS SHOT AT LEAST ONE TIME IN THE HEAD BY A GUNMAN WHO F ED SEVERAL SHOTS AT HIM AND 12 YEAR OLD C.D. AS THEY WERE STANDING IN FRONT OF C.D. S HOME. BOTH T.M. AND C.D. LATER DIED FROM GUNSHOT WOUNDS THEY SUFFERED DURING THE INCIDENT. A WITNESS TO THE SHOOTING HAS IDENTIFIED THE PERSON HE OBSERVED SHOOTING AT BOTH VICTIMS AS "BABY G'S" OR "BABY JES". SHORTLY AFTER THE SHOOTING POLICE FOUND THE DEF. AKA "BABY JES" IN A WOODED AREA NEAR CALK STREET NEAR THE LOCATION OF THE SHOOTING. THE WITNESS IDENTIFIED THE DEF. IN A SHOW-UP I.D. AS THE PERSON WHO SHOT BOTH VICTIMS.

Signature of Affiant

Affiant's Address #1 JUSTICE SQ COLA, SC. 29201

Affiant's Telephone 5453200

STATE OF SOUTH CAROLINA

☐ County/ ☒ Municipality of COLUMBIA

ARREST WARRANT

TO ANY LAW ENFORCEMENT OFFICER OF THIS STATE OR MUNICIPALITY OR ANY CONSTABLE OF THIS COUNTY:

It appearing from the above affidavit that there are reasonable grounds to believe that on 08/26/2004 defendant CHRIS A LIVERMAN did violate the criminal laws of the State of South Carolina (or ordinance of ☐ County/ ☒ Municipality of COLUMBIA) as set forth below:

DESCRIPTION OF OFFENSE: MURDER 16-3-10

Having found probable cause and the above affiant having sworn before me, you are empowered and directed to arrest the said defendant and bring him or her before me forthwith to be dealt with according to law. A copy of this Arrest Warrant shall be delivered to the defendant at the time of its execution, or as soon thereafter as is practicable.

Sworn to and subscribed before me on 08/27/2004

(L.S.)

[redacted] 485083

Magistrate Code: Municipal Recorder

Judge's Address CITY OF COLUMBIA, SC MUNICIPAL COURT, P.O. BOX 644 29202

Judge's Telephone

Issuing Court: ☐ Magistrate ☒ Municipal ☐ Circuit

ORIGINAL

2449

ARREST WARRANT

H760157 H-760157 0427582

STATE OF SOUTH CAROLINA

☐ County/ ☒ Municipality of COLUMBIA

THE STATE

against

CHRIS A LIVERMAN

Address: [redacted]

COLUMBIA SC 00000

Phone: _____ SSN: _____

Sex: [redacted] Race: B Height: 6 02 Weight: 180

DL State: _____ DL#: _____

DOB: [redacted] Agency ORI#: SC0400100

Prosecuting Agency: CITY OF COLUMBIA

Prosecuting Officer: GRAY J/ROSS

Offense: MURDER

Offense Code: HOM

Code/Ordinance Sec. 16-3-10

This warrant is **CERTIFIED FOR SERVICE** in the ☐ County/ ☒ Municipality of COLUMBIA. The accused is to be arrested and brought before me to be dealt with according to law.

_____ (L.S.)
Signature of Judge

Date: _____

RETURN

A copy of this arrest warrant was delivered to defendant Chris. Liverman on 08-27-04.

J.C.S. Huntley
Signature of Constable/Law Enforcement Officer

RETURN WARRANT TO:

CITY OF COLUMBIA
MUNICIPAL COURT
P.O. BOX 644
COLUMBIA, S. C. 29202

STATE OF SOUTH CAROLINA
☐ County/ ☒ Municipality of COLUMBIA

AFFIDAVIT

Form Approved by S.C. Attorney General April 21, 2003 SCCA 618

2450

Personally appeared before me the affiant J GRAY who being duly sworn deposes and says that defendant CHRIS A LIVERMAN did within this county and state on 08/26/2004 violate the criminal laws of the State of South Carolina (or ordinance of ☐ County/ ☒ Municipality of COLUMBIA) in the following particulars:

DESCRIPTION OF OFFENSE: MURDER 16-3-10

I further state that there is probable cause to believe that the defendant named above did commit the crime set forth and that probable cause is based on the following facts:

ON SAID DATE AT [redacted] T.S. MARTIN DRIVE TWELVE YEAR OLD [redacted] C.D. [redacted] WAS STANDING OUTSIDE HER HOME WITH [redacted] T.M. [redacted] WHEN THE DEF. APPROACHED THE 100 BLOCK OF T.S. MARTIN AND BEGAN SHOOTING MULTIPLE TIMES TOWARD BOTH [redacted] T.M. [redacted] AND [redacted] C.D. [redacted] BOTH VICTIMS WERE SHOT AT LEAST ONCE IN THE HEAD AREA AND LATER DIED FROM THEIR WOUNDS WHILE AT PRMH. A WITNESS TO THE SHOOTING SAW THE DEF COMMIT THE SHOOTING AND KNOWS THE DEF. BY AN ALIAS "BABY JES". POLICE RESPONDED AND FOUND THE DEF. NEAR THE SHOOTING LOCATION IN A WOODED AREA OFF CALK STREET AND DETAINED HIM THERE. THE WITNESS THEN IDENTIFIED LIVERMAN AS THE PERSON HE SAW SHOOT BOTH VICTIMS AS DESCRIBED.

Signature of Affiant

Affiant's Address #1 JUSTICE SQ
COLA. SC. 29201

Affiant's Telephone 5453500

STATE OF SOUTH CAROLINA
☐ County/ ☒ Municipality of COLUMBIA

ARREST WARRANT

TO ANY LAW ENFORCEMENT OFFICER OF THIS STATE OR MUNICIPALITY OR ANY CONSTABLE OF THIS COUNTY:

It appearing from the above affidavit that there are reasonable grounds to believe that on 08/26/2004 defendant CHRIS A LIVERMAN did violate the criminal laws of the State of South Carolina (or ordinance of ☐ County/ ☒ Municipality of COLUMBIA) as set forth below:

DESCRIPTION OF OFFENSE: MURDER 16-3-10

Having found probable cause and the above affiant having sworn before me, you are empowered and directed to arrest the said defendant and bring him or her before me forthwith to be dealt with according to law. A copy of this Arrest Warrant shall be delivered to the defendant at the time of its execution, or as soon thereafter as is practicable.

Sworn to and subscribed before me on 08/27/2004

[redacted] (L.S.)
Signature of Issuing Judge
Judge Code: Magistrate Recorder

Judge's Address CITY OF COLUMBIA, SC
MUNICIPAL COURT, P.O. BOX 644 29202

Judge's Telephone _____

Issuing Court: ☐ Magistrate ☒ Municipal ☐ Circuit

ORIGINAL

WITNESSES

(S) J. Gray, C.P.D.

ARREST WARRANT NUMBER

H760156

ACTION OF GRAND JURY

TRUE BILL

Foreperson of Grand Jury
Date: APR 2 1 2005

VERDICT

Foreperson of Petit Jury
Date:

DOCKET NO. 2005-GS-40-06831

The State of South Carolina

County of Richland

COURT OF GENERAL SESSIONS

APRIL TERM 2005

92

THE STATE
vs.

CHRIS LIVERMAN

Indictment for

MURDER

SC Code: **16-3-10**
CDR Code:**0116**
Class **FEL/EXM(V)**

After being fully advised as to my legal rights, I hereby waive presentment to the Grand Jury.

Defendant

I _____
hereby appear in my own proper person and plead guilty to the within indictment or to

Defendant

Witness:

C.C.C. PLS. AND G.S.

2451

2452

STATE OF SOUTH CAROLINA)
)
COUNTY OF RICHLAND)

INDICTMENT

At a Court of General Sessions, convened on APRIL 20, 2005, the Grand Jurors of Richland County present upon their oath:

MURDER

That CHRIS LIVERMAN did in Richland County on or about AUGUST 26, 2004, feloniously, willfully and with malice aforethought, kill one [redacted] C.D. by means of a gunshot and that the said victim died as a proximate result thereof; all in violation of SC Code of Laws § 16-3-10

Against the peace and dignity of the State, and contrary to the statute in such case made and provided.

Warren B. Giese, SOLICITOR

WITNESSES

(S) J. Gray, C.P.D.

ARREST WARRANT NUMBER

H760157

ACTION OF GRAND JURY

TRUE BILL

Foreperson of Grand Jury

Date: APR 2 1 2005

VERDICT

Foreperson of Petit Jury

Date:

DOCKET NO. 2005-GS-40-06832

The State of South Carolina

County of Richland

COURT OF GENERAL SESSIONS

APRIL **TERM 2005**

92

THE STATE
vs.

CHRIS LIVERMAN

Indictment for

MURDER

SC Code: **16-3-10**
CDR Code:**0116**
Class **FEL/EXM(V)**

After being fully advised as to my legal rights, I hereby waive presentment to the Grand Jury.

Defendant

I _____
hereby appear in my own proper person and plead guilty to the within indictment or to

Defendant

Witness:

C.C.C. PLS. AND G.S.

STATE OF SOUTH CAROLINA)
)
COUNTY OF RICHLAND)

INDICTMENT

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That CHRIS LIVERMAN did in Richland County on or about AUGUST 26, 2004, feloniously, willfully and with malice aforethought, kill one [redacted] T.M. by means of a gunshot and that the said victim died as a proximate result thereof; all in violation of SC Code of Laws § 16-3-10.

Against the peace and dignity of the State, and contrary to the statute in such case made and provided.

Warren B. Giese, SOLICITOR

2455

STATE OF SOUTH CAROLINA)
COUNTY OF Richland)
STATE VS.)
Chris Liverman)
AKA:)
Race: B Sex: M Age:)
DOB: SS#:)
Address:)
City, State, Zip)
DL# SID#)

IN THE COURT OF GENERAL SESSIONS

INDICTMENT/CASE#:
05 -GS- 40 - 06831
A/W#: H760156
Date of Offense: August 26, 2004
S.C. Code §: 16-3-10
CDR Code #: 0 / 1 / 1 / 6
☐ CASE RESTORED
SENTENCE
☐ PLEA ☑ TRIAL

In disposition of the said indictment comes now the Defendant who was ☑ CONVICTED OF or ☐ PLEADS TO: Murder
in violation of § 16-3-10 of the S.C. Code of Laws, bearing CDR Code # 0 / 1 / 1 / 6
☐ NON-VIOLENT ☐ VIOLENT ☐ SERIOUS ☐ MOST SERIOUS ☐ 17-25-45

The charge is: ☐ As Indicted, ☐ Lesser Included Offense, ☐ Defendant Waives Presentment to Grand Jury.
The plea is: ☐ Without Negotiations or Recommendation, ☐ Negotiated Sentence, ☐ Recommendation by the State.
ATTEST:

Solicitor | Defendant | Attorney for Defendant

WHEREFORE, the Defendant is committed to the ☒ **State Department of Corrections**, ☐ **County Detention Center**, for a determinate term of LIFE ~~days/months/years~~ or ☐ under the **Youthful Offender Act** not to exceed _____ years and/or to pay a fine of $_____; provided that upon the service of ____ days/months/years and/or payment of $_____; plus costs and assessments as applicable*; the balance is suspended with **probation** for _____ months/years and subject to South Carolina Department of Probation, Parole and Pardon Services standard conditions of probation, which are incorporated by reference.
☐ CONCURRENT or ☐ CONSECUTIVE to sentence on:_____
☐ The Defendant is to be given credit for time served pursuant to S.C. Code §24-13-40 to be calculated and applied by the State Department of Corrections.
☐ The Defendant is to be placed on the Central Registry of Child Abuse and Neglect pursuant to S.C. Code §17-25-135.

SPECIAL CONDITIONS:

☐ RESTITUTION: ☐ Heard, ☐ Waived, ☐ Ordered
Total: $_____ plus 20% fee: $_____
Payment Terms:
☐ set by SCDPPPS

Recipient:

*Fine:		$
§14-1-206 (Assessments 107.5%)		$
§14-1-211(A)(1) (Conv. Surcharge)	$100	$
§14-1-211(A)(2) (DUI Surcharge)	$100	$
§56-5-2995 (DUI Assessment)	$12	$
§ 35.13 (Public Def/Prob)	$500	$
§73.3, 1B TP (Law Enforce. Funding)	$25	$
§33.7, 1B TP (Drug Court Surcharge)	$100	$
§50-21-114(BUI Breath Test Fee)	$50	$
§56-5-2942(J) (Vehicle Assessment)	$40/ea	$
3% to County (if paid in installments)		$
TOTAL		$

PTUP
_____ days/hours Public Service Employment
Obtain GED
Attend Voc. Rehab. or Job Corp.
May serve W/E beginning
Substance Abuse Counseling
Random Drug/Alcohol Testing
Fine may be pd. in equal, consecutive weekly/monthly pmts. of $ _____ beginning _____
$ _____ paid to Public Defender Fund
Other:

☐ Appointed PD or appointed other counsel, §35.13 TP Requires $500 be paid to Clerk during probation.

Barbara A. Scott/PF
Clerk of Court/ Deputy Clerk
Court Reporter: K. Tracy

PRESIDING JUDGE
Judge Code: 2015
Sentence Date: 11-9-06

SCCA/217 (2/2006) *White* – Clerk *Green* – Corrections *Canary* – Probation *Pink* – Defendant

2456

STATE OF SOUTH CAROLINA)
COUNTY OF Richland)
STATE VS.)
Chris Liverman)
AKA:)
Race: B Sex: M Age:)
DOB: SS#:)
Address:)
City, State, Zip)
DL# SID#)

IN THE COURT OF GENERAL SESSIONS

INDICTMENT/CASE#:
05 -GS- 40 - 06832
A/W#: H760157
Date of Offense: August 26, 2004
S.C. Code §: 16-3-10 SC code
CDR Code #: 0 / 1 / 1 / 6
☐ CASE RESTORED
SENTENCE
☐ PLEA ☑ TRIAL

In disposition of the said indictment comes now the Defendant who was ☑ CONVICTED OF or ☐ PLEADS TO: Murder
in violation of § 16-3-10 of the S.C. Code of Laws, bearing CDR Code # 0 / 1 / 1 / 6
☐ NON-VIOLENT ☐ VIOLENT ☐ SERIOUS ☐ MOST SERIOUS ☐ 17-25-45

The charge is: ☐ As Indicted, ☐ Lesser Included Offense, ☐ Defendant Waives Presentment to Grand Jury.
The plea is: ☐ Without Negotiations or Recommendation, ☐ Negotiated Sentence, ☐ Recommendation by the State.
ATTEST:

Solicitor | Defendant | Attorney for Defendant

WHEREFORE, the Defendant is committed to the ☒ **State Department of Corrections**, ☐ **County Detention Center**, for a determinate term of LIFE ~~days/months/years~~ or ☐ under the **Youthful Offender Act** not to exceed _____ years and/or to pay a fine of $_____; provided that upon the service of ____ days/months/years and/or payment of $_____; plus costs and assessments as applicable*; the balance is suspended with **probation** for _____ months/years and subject to South Carolina Department of Probation, Parole and Pardon Services standard conditions of probation, which are incorporated by reference.
☐ CONCURRENT or ☒ CONSECUTIVE to sentence on: 11-9-06
☐ The Defendant is to be given credit for time served pursuant to S.C. Code §24-13-40 to be calculated and applied by the State Department of Corrections.
☐ The Defendant is to be placed on the Central Registry of Child Abuse and Neglect pursuant to S.C. Code §17-25-135.

SPECIAL CONDITIONS:

☐ RESTITUTION: ☐ Heard, ☐ Waived, ☐ Ordered
Total: $ plus 20% fee: $
Payment Terms:
☐ set by SCDPPPS

Recipient:

*Fine:		$
§14-1-206 (Assessments 107.5%)		$
§14-1-211(A)(1) (Conv. Surcharge)	$100	$
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§56-5-2942(J) (Vehicle Assessment)	$40/ea	$
3% to County (if paid in installments)		$
TOTAL		$

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_____ days/hours Public Service Employment
Obtain GED
Attend Voc. Rehab. or Job Corp.
May serve W/E beginning
Substance Abuse Counseling
Random Drug/Alcohol Testing
Fine may be pd. in equal, consecutive weekly/monthly pmts. of $ _____ beginning
$ _____ paid to Public Defender Fund
Other:

☐ Appointed PD or appointed other counsel, §35.13 TP Requires $500 be paid to Clerk during probation.

Barbara A. Scott/PF
Clerk of Court/ Deputy Clerk
Court Reporter: K. Tracy

PRESIDING JUDGE
Judge Code: 2 7 0 1 5 1 5
Sentence Date: 11-9-06

SCCA/217 (2/2006) *White* – Clerk *Green* – Corrections *Canary* – Probation *Pink* – Defendant