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S.C. SUPREME COURT

Exhibit I

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA**

Freddie Owens,

Petitioner,

-vs-

CA No 0:16-cv-02512-TLW-PJG

Bryan P. Stirling, Commissioner
South Carolina Department of
Corrections, Joseph McFadden,
Warden, Leiber Correctional
Institution,

Respondents.

AFFIDAVIT OF STACEY WOOD, Ph.D. CLINICAL NEUROPSYCHOLOGY

The affiant, first being duly sworn, states and deposes as follows:

1. Credentials of the Expert Witness: Dr. Wood received her undergraduate degree in Bio-Psychology from Middlebury College in Bio-Psychology 1989, my Ph.D. in Clinical Neuropsychology from the University of Houston in neuropsychology 1995, and completed a Postdoctoral Fellowship in neuropsychology at UCLA in 1997. Dr. Wood served as an Assistant Research Professor in the Department of Neurology at UCLA from 1996 to 2001. From 1998 to 2001, she also served as an Assistant Professor in the Department of Psychology at Scripps College. From 2001 to 2004, she was employed as an Assistant Professor in the Department of Psychology at the University of Colorado in Colorado Springs. From 2004 to 2006, Dr. Wood was an Assistant Professor in the Department of Psychology at Scripps College, and in January 2007, was promoted to Associate Professor. From 2008 to 2010 and from 2011 to 2013, she served as Chair of the Department of Psychology at Scripps College. Dr. Wood was promoted to Full Professor in 2014. Dr. Wood has been in private practice as a

neuropsychologist since 2004, specializing in the assessment of decisional abilities in forensic cases (criminal, civil, & probate).

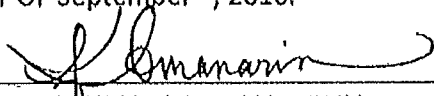
Dr. Wood is licensed clinical neuropsychologist in the state of California (PY 16805) and has been licensed in California since 2000. Dr. Wood has worked as a consulting expert witness on well over 300 cases, including federal, criminal (including capital), civil, probate, and arbitration matters, and has testified as an expert about 38 times. Dr. Wood has served on the Superior Court expert panel in Los Angeles County and Riverside County, CA. The attached *curriculum vita* (Exhibit A) is a true and accurate representation of the affiant's education, academic achievements, publications and clinical experience. She has qualified as an expert witness in court proceedings.

2. The tests selected for use are standards accepted as reliable in the field of neuropsychology and the examiner adhered to the specified protocol for administering the tests. The affiant scored the test in keeping with the specified protocol associated with the particular test used. The use and application of the results conform to standards of neuropsychology.

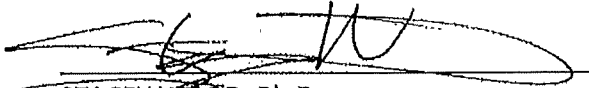
3. The affiant used notes from her personal observations of the petitioner and results from tests she administered to him as well as records concerning the petitioner's personal, social, medical, familial and custodial life in forming the opinions expressed in the report. All the information used is of the type and from sources normally relied upon by experts in clinical neuropsychology.

4. The tests administered and scored by the affiant and the opinions expressed in the report (Exhibit B) are within her field of specialty. The opinions expressed in the report are to a reasonable degree of certainty in the field of clinical neuropsychology.

SWORN TO BEFORE ME THIS 6TH
DAY OF September , 2016.



NOTARY PUBLIC FOR CALIFORNIA
My Commissioner Expires on JUNE 17, 2020



STACEY WOOD, Ph.D.

State of California
County of Los Angeles
Subscribed and sworn to before me
On this 6 day of SEPT., 2016
STACEY WOOD, Ph.D.
proved to me on the basis of satisfactory
evidence to be the person who appeared
before me.



Stacey Wood, Ph.D.

Department of Psychology

1030 Columbia Ave.

Claremont, CA 91711

CONFIDENTIAL DOCUMENT

NEUROPSYCHOLOGICAL REVIEW & EVALUATION

RE: Mr. Freddie Eugene Owens (AKA Khalil Black Devine Son Allah)

Date of Birth: 3/18/1978
Age: 38 years-old
Gender: Male
Handedness: Right
Ethnicity: African American
Highest Grade Completed: 9th Grade
Date of Evaluation: 8/18/16

Referral: Mr. William H. (Hank) Ehliès, Attorney At Law

Referral Question and Case Background: I was asked by Mr. Hank Ehliès, counsel for Mr. Freddy Owens, to determine if Mr. Owens had evidence of brain injury and neurocognitive impairment, and, if so, the severity of that impairment, and its etiology. Mr. Owens was tried, convicted and sentenced to death February 1, 1999 for the murder of Ms. Irene Graves. The defendant was 19 years old at the time. Mr. Owens was also convicted of three other charges: Armed robbery, use of a weapon during the course of the offense, and conspiracy. In addition, between his guilty verdict and the

beginning of the sentencing portion of his trial the defendant killed cellmate Christopher Lee. The evidence of the death of Mr. Lee was introduced in the penalty phase. The South Carolina Supreme Court affirmed Mr. Owen's convictions but reversed the sentence and ordered a new sentencing trial on September 4, 2001. After a second sentencing proceeding Mr. Owens was again sentenced to death, this time by circuit Judge John Kittredge. The South Carolina Supreme Court reversed the second death sentence on December 20, 2004. After the third sentencing proceeding Mr. Owens was again sentenced to death for the murder of Ms. Irene Graves by the Hon. Larry Patterson. The South Carolina Supreme Court confirmed the death sentence in State versus Owens on July 14, 2008. The United States Supreme Court denied certiorari on January 21, 2009. Mr. Owens' final application for post-conviction relief was filed on January 29, 2009. Post-conviction relief was denied on February 3, 2013. A petition for habeas corpus relief was filed in US District Court and a stay of execution was issued by the Federal Court on August 7, 2015.

In order to assist in this matter, I reviewed available medical, school and other records pertaining to Mr. Owens and conducted an in-person assessment of Mr. Owens to further explore issues related to neurocognitive and brain functioning. A complete list of the materials I reviewed to prepare for my in-person assessment of Mr. Owens is listed below.

Sources of Information:

1. Chronology of the case
2. Dora Mason Affidavit

3. Dr. James Evans trial testimony and test data
4. Dr. Watts psychiatric evaluation
5. Genogram
6. Greenville psychiatry report
7. Judge Kitteridge order
8. Judge Miller's order
9. Marie Owens affidavit
10. Marjorie Hammocks trial testimony 1999
11. Maxine Mingo's affidavit
12. SC DC medical records
13. School letters
14. Report and Data of Dr. Brawley
15. Report and Data of Dr. Ruben Gur and colleagues

Review of existing documents:

School Records:

According to available School records, Mr. Owens was born on 3/18/78. He and his siblings were placed in DSS Foster care on August 16, 1983 at age 5. They had been left alone at home in a house with no food and no electricity and removed for physical neglect. As a result school records do not specifically indicate where Mr. Owens attended kindergarten. In 1984 Mr. Owens attended Cone Elementary School for the first part of first grade and then transferred to Sans Souci Elementary School. Mr. Owens was held back in the first grade and he was also absent for approximately 20

days. In 1985 Mr. Owens repeated first grade and received mixed grades with A's in math, C's in Reading and B's in Language.

According to available records, Mr. Owens teacher requested an intervention. She noted that Mr. Owens arrived in school in dirty clothing, and that he had been kicked off the bus for fighting. As a result he had no transportation to and from school and was absent from school. Records also indicate that in the first grade Mr. Owens was receiving speech therapy. Mr. Owens grades declined in second and third grade. In fourth grade Mr. Owens received mostly C's D's and "U's" for unsatisfactory performance. His conduct grades indicated a need for improvement and he missed 28 days of school. He was referred for psychological evaluation in December 1988. Results from that evaluation revealed an IQ in the low average range with significantly worsened verbal performance than nonverbal. Records also reveal difficulties with distraction, poor impulse control or anger control and poor social conformity. As a result he was placed in the learning disabled resource class. Records indicated a significant discrepancy between IQ and ability (PIQ = 92; Math Calculation SS = 71). Full test scores from 12/14/88 indicated a low average IQ (FS = 85) with a relative weakness in language abilities (VIQ = 80).

Mr. Owens continued in the Learning Disabled Resource class through sixth grade. Mr. Owens was required to repeat the sixth grade at Greenville Middle School. His class rank was 227 out of 254 and his is cumulative GPA was 1.171.

Standardized test scores were also reviewed for Mr. Owens. Records from first grade in 1986 at age 8 placed his abilities broadly in the average to low average range.

In grade 4 (1989, age 11, typical fourth grader is age 9) his scores reflected grade equivalences of 3rd to 4th grade abilities. Junior high school records indicated standardized test scores that were consistent with above, average to low average standardized scores (Grade 7; 1991, Age 13). However one must recall *norms used for the standardized test scores would reflect children up to 2 years younger than Mr. Owens* who repeated the first and 6th grade so that Mr. Owens is not being compared to age matched peers but rather individuals placed in the same grade. Overall, mathematical computation and vocabulary were a relative weakness for Mr. Owens performing around the 10th percentile in comparison to grade matched (but not age matched) norms (1990; 1992). Age-matched norms would have reflected significantly lower scores and speak to his overall lower level of functioning as a much younger child.

Mr. Owens was able to pass the South Carolina basic skills tests in mathematics and reading, but did not pass in writing and in science (1991-1992). Mr. Owens is noted to have poor attendance missing approximately 20 days per year. Mr. Owens is noted to be withdrawing from 9th grade in 1995 (age 17; most children are approximately age 14 entering 9th grade).

Previous School Psychological Evaluations:

Mr. Owens was evaluated on 12/14/88 at age 10.8 (fourth grade) by Ms. Janet L. Hawkins a school psychologist. His IQ scores were in the low average range as assessed by the WISC- R (scores not noted in report). He scored roughly at the third to fourth grade level abilities in reading and spelling, but very poor abilities in mathematics

and he qualified for services. Ms. Hawkins also noted behavioral concerns including anxiety and impulsive aggression when angry.

Mr. Owens was re-evaluated on 2/17/91 at age 13.8 by Mr. Reginald Pearson, a school psychologist. His IQ scores were in the low average range as assessed by the WISC-R (F.S. IQ = 84; Performance IQ = 86; Verbal IQ = 85). Individual test scores indicated a relative weakness in block design (5th percentile) with most scores around the 16th percentile. Performance on the Wide Range Achievement Test (WRAT-R) revealed an average performance in Reading (SS = 96; %), a borderline score in Spelling (SS = 78, 8th percentile) and an impaired score in mathematical calculation (SS = 69; 2nd percentile). However on the Woodcock Johnson Test of Achievement, he performed in the low average range on a test of calculation (SS = 87).

In summary, school records document a history of poverty and neglect, learning disabilities, poor school achievement, absences, retentions (first and sixth grade), and school interventions. Mr. Owens' learning disabilities impaired his speech (speech therapy) and impaired his ability to learn mathematical concepts. Mr. Owens was also noted to have difficulties with attention, impulsivity, and behavior management. Overall, these challenges were apparent from his earliest days as a student, consistent with a developmental etiology. His school performance "improved" in comparison to significantly younger children (approx. 2 years) and he was promoted to 7th grade and removed to from the resource intervention program.

Medical Records: Available medical records from the South Carolina Department of Corrections dated (2000 - 2006) were reviewed. These records listed the following diagnoses:

1. Intermittent Explosive Disorder
2. Anxiety Disorder
3. Antisocial Personality Disorder
4. History of Seizures
5. Insomnia
6. Kidney Stones and related flank pain (2002)
7. Depression (2006)
8. Diabetes (2016)
9. Hypertension (2016)
10. Peripheral Neuropathy (2016)

Mr. Owens was asked about his medical history. He reported a history of concussion and loss of consciousness on several occasions resulting from fights. These reports are consistent with affidavits of family members who reported a history of fighting and violence.

Psychiatric History: Mr. Owens reported a history a Bipolar illness and depression. Medical records indicated anxiety, Depression, Intermittent Explosive Disorder, and Bipolar Disorder. This examiner also noted significant cutting.

Medications administered during his incarceration included the following, based on a

review of medical records:

1. Depakote (seizures)
2. Vistaril (antihistamine / sleep aid)
3. Risperidal (antipsychotic / impulse control)
4. Hydroxytine Pamoate (Anxiety)
5. Deseryl / Trazadone (antidepressant)
6. Wellbutrin (Antidepressant)

Current medications based on report by Mr. Owens Included

1. Thorazine (psychotic symptoms; agitation)
2. Celexa (Depression)
3. Vistaril (Anxiety , nausea)
4. Risperidol (Psychotic Symptoms, Bipolar)
- 5 Medication for high Blood pressure (unknown)

Neuroimaging Data:

A comprehensive analysis of structural and functional brain integrity using MRI and PET neuroimaging techniques were completed Dr. Ruben Gur. Dr. Gur is a Professor at the University of Pennsylvania and an expert on neuropsychology and neuroimaging. A structural MRI is conducted to generate images of Mr. Owen's brain volume by region.

Next, Mr. Owen's MRI was then compared to normative data from an MRI atlas that contain averages from hundreds of normative controls. According to Dr. Gur, specific brain regions can then be compared to a normative base related to brain volume and characterized as average in volume, clinically significant (-1 to -2 SD), and abnormally small (-3 SD). Based on his analysis of the MRI data from Mr. Owens, he concluded that the client has several brain regions that are smaller by volume in comparison to averages than one would predict based on his age alone. His frontal lobe is smaller than one would expect and places him in the clinically significant range. Overall brain volume is at the low range of normal. However an analysis of the volume of specific brain regions indicated significant abnormalities. Notably the temporal lobe was 3 standard deviations below average in terms of volume (< 1st percentile; abnormal). The MRI details structural abnormalities and volume changes. Overall, this analysis indicated that Mr. Owens has a clinically significant smaller frontal lobe (-1 SD) and an abnormally small temporal lobe bilaterally (-3 SD). Loss of volume (brain cells and myelin) can reflect developmental injuries or acquired injuries.

An analysis of brain functioning using PET methodology was also completed by Dr. Gur. PET is a functional technique that allows for analyses of brain functioning versus structural integrity by examining glucose uptake and use in different brain regions. For example, areas that are highly active will require more fuel. PET can indicate the patterns of glucose uptake and use in the resting brain. This analysis is typically conducted when the brain is in a resting, wakeful state described as default mode. The current analysis of Mr. Owen's PET data indicated significantly different patterns of activation than one would typically predict in default mode. This analysis

demonstrated significantly lower glucose activation in hippocampus and amygdala regions. These regions are located in the medial temporal lobe. In contrast many areas of the cortex demonstrated increased activation. This is an immediate result of efforts to compensate for brain regions that are hypoactive. According to Dr. Gur, this had suggested someone who is utilizing resources to regulate emotion, even at rest. However in conflict or stress this pattern may reverse resulting in decreased activation in the broader regions of the cortex related to deliberation.

Previous Neuropsychological Evaluations:

Mr. Owens was evaluated by Dr. James Evans, a neuropsychologist, who testified at trial in 2004. According to trial transcripts, Dr. Evans administered an IQ test, some subtests from the Halsted Reitan neuropsychological test battery, the Wisconsin Card Sorting Test, a verbal fluency test, and some subtests from the Wechsler Memory Scales battery. He also reported that he administered two tests of academic achievement, reading and mathematics. Overall, Dr. Evans reported that the IQ came up "within normal limits", he scored in the mild brain dysfunction impairment rating on the Halstead Reitan, and had mixed findings on tests of memory with one being within normal limits (verbal) and another at the 16th percentile (faces). Dr. Evans noted that Mr. Owens also demonstrated mild impairment on an auditory attention test as assessed with an auditory continuous performance test. Dr. Evans concluded that while Mr. Owens had average general intellectual abilities, he had evidence of mild brain impairment, related to frontal and temporal lobe areas.

A second neuropsychological evaluation was completed on 09/12/06 by Dr. Tora Brawley. Neuropsychological testing revealed a full-scale IQ of 100; verbal IQ 105, and a Performance IQ 92 which places him in the overall average range of intellectual functioning. Deficits revealed included borderline verbal learning, borderline verbal memory, and borderline manual dexterity, 7th – 11th percentile. Most other areas of functioning were in the below average to average range. Performance on forced choice testing was completed within normal limits. Testing for this assessment included the Wechsler Adult Intelligence Scales- III (WAIS-III), the Wechsler Test of Adult Reading (WTAR), the Repeatable Battery for Neuropsychological Status (RBANS), the Trail Making Test, The TOMM, Verbal Fluency, and grooved pegboard. Performance on measures of verbal learning and verbal memory were in the borderline impaired range.

Current Assessment:

My in-person assessment of Mr. Owens took place at Lieber Correctional Institute in South Caroline on August 18th, 2016. Mr. Owens has completed neuropsychological testing on two prior occasions. Current testing was done to probe cognitive domains that were not assessed in the past and that would be reasonable to consider given medical and school records. These tests covered the following conceptual domains: Overall mental status, response inhibition and error monitoring, risk taking and decision-making, verbal memory, non-verbal memory, and motivation. Data from these standardized measures is ordinarily relied upon for evaluations of

cognitive abilities¹. Neuropsychological research supports the validity of the use of these tests to assess the integrity of neurocognitive functioning in general, with patterns of strengths and weaknesses suggestive of specific areas of brain impairment².

My assessment also included a clinical interview with Mr. Owens and a review of available documents relevant to Mr. Owens's medical and social history, including personal and family medical records, psychiatric records, academic records, and testimony and accounts from family members and other witnesses to Mr. Owens's growth and conduct over the course of his life, as detailed in sources of information.

Behavioral Observations

Mr. Owens is a 38-year old, right-handed African-American man who was tested individually in a private conference room on death row at Lieber Correctional facility in South Carolina. Mr. Owens was engaged, polite and cooperative with the testing at the test sessions. His effort on the formal measures of malingering was excellent. My own clinical observations also confirmed that Mr. Owens put forth his best efforts during the testing sessions, as I witnessed no indications of any effort to malingering or intentionally perform poorly. Finally, it is my opinion that Mr. Owens's test results are a valid indication of his level of cognitive functioning.

Throughout the administration of the test battery, Mr. Owens's speech was fluent and goal-directed. Interpersonally, Mr. Owens was cooperative and made good eye contact with me. Mr. Owens was fluent in English and his speech was normal in tone, rate and prosody. His mood was calm, and upbeat. I saw no evidence of delusions or

¹ See generally Muriel D. Lezak, M.D., *NEUROPSYCHOLOGICAL ASSESSMENT* (Oxford Univ. Press: 4th Ed., 2004), Chs. 1 – 5. A version of this text was available since 1983.

² Lezak

perceptual disturbance. Mr. Owens was alert and oriented to person, place, and time. His thought processes were logical. He was able to discuss some current events. Mr. Owens informed me that he had not taken any medications on the morning of our testing.

TESTS ADMINISTERED:

1. Clinical interview
2. Montreal Cognitive Assessment (MoCA)³
3. Delis Kaplan Executive Function System Color-Word interference⁴
4. Iowa Gambling Test (IGT)⁵
5. Rey Figure: Copy, Immediate, Delayed
6. Dot Counting (Motivation)

Mr. Owens's neuropsychological test data were interpreted using standardized instructions that require a conversion of raw scores to standard scores and comparison to age and education matched norms. This conversion allows for apples-to-apples comparisons across test domains, and allows us to see how Mr. Owens is functioning in

³ The Montreal Cognitive Assessment (MoCA) was created in 1996 by Ziad Nasreddine in Montreal, Quebec. It was validated in the setting of mild cognitive impairment, and has subsequently been adopted in numerous other settings clinically.

⁴ There are a number of versions of the color-word interference or "Stroop" tests including a version published by Golden (1977) that would have been available in 1997.

⁵ The IGT was first described in the literature in 1994 in an open access form, and commonly used in decision-making research. Bechara, A., Damásio, A. R., Damásio, H., Anderson, S. W. (1994). "Insensitivity to future consequences following damage to human prefrontal cortex". *Cognition* 50 (1-3): 7-15. It became commercially available in 2007 from PAR (Bechara, 2007; The Iowa Gambling Test Manual. Psychological Assessment Resources).

comparison to his peers. With the exception of the Iowa Gambling Test, all of the tests I administered or prior versions of them were available at the time of Mr. Owens's original trial in 1999.

The tests I used to evaluate Mr. Owens were instruments that have not been included in previous assessments. Individuals with similar medical and neuroimaging results would be likely to have deficits in the areas relevant to temporal lobe functioning (new learning, and memory), and related to deficits in frontal lobe functioning (executive functioning). Previous batteries included measures of verbal and non-verbal memory and as such a brief measure was included to corroborate these findings but not duplicate previous efforts (MoCA). Previous batteries (Brawley) included a very limited assessment of frontal lobe functioning / executive functioning. Individuals with impaired executive functioning have difficulty with goal-oriented behaviors, are more sensitive to contextual factors in their decision-making overall. These individuals often demonstrate poor emotional regulation. They typically have poor insight into their abilities and are less responsive to corrective feedback to help get back on track. The frontal lobes are large structures and it is possible to see intact performance on some of these abilities and impairment on others. For example, it is possible to have difficulty with sequencing, but intact abstraction. As such it is typically prudent to include multiple measures of executive functioning to provide a comprehensive assessment of the wide range of abilities. For this assessment, the MoCA, Iowa Gambling Test, and the Stroop were added to better flesh out whether or not there was evidence of frontal lobe impairment and if so, the nature of that impairment.

TEST RESULTS:

Neuropsychological findings:

Overall Mental Status: The MoCA is a 30 item assessment tool used to assess overall mental status. Mr. Owens's score of 22/30 (23/ 30 corrected for education) is below the 25 / 30 threshold indicative of cognitive impairment. Mr. Owens had difficulty on items related to executive functioning and related to verbal recall (recalled 1 / 5 words after a few minutes). These scores are in the range of mild cognitive impairment.

Memory: Mr. Owens's ability to learn information over time and retain it (long-term memory) was assessed. Overall, Mr. Owens's performance on the testing showed that his verbal memory abilities are impaired (MoCA left hemisphere), but his non-verbal memory abilities were relatively intact (Rey Figure, within normal limits right hemisphere).

On a visual memory task, Mr. Owens performed in the average range, both immediately after presentation and after a significant delay. (Rey Figure, immediate and delayed; 50th and 69th percentile, respectively).

Executive Functioning and Decision-Making: Performance on measures of executive functioning were mixed, with some tests indicative of weakness and others not. On a task that assesses response inhibition and the ability to monitor errors, Mr. Owens's performance was at the first percentile (Stroop color word interference condition; < 1st percentile. Individuals who perform poorly on this measure have difficulty inhibiting a dominant response (reading a word) while completing a second task. They

also tend to have poor monitoring for errors meaning they may not realize they have made an error (reading the word, versus the task instructions of naming a color), and can be impulsive. Mr. Owens' slow performance on this task was in the context of average word reading skills assessed and intact color vision. The Stroop test is sensitive to the angular cingulate and other frontal lobe regions that are not easily assessed by other tools. Mr. Owen's scores at the first percentile are severely impaired and result in less ability to monitor and inhibit behavior.

On a card task designed to assess emotional decision-making and the ability to delay short term gain for long term gain, the Iowa Gambling Task ("IGT"), Mr. Owens's performance pattern indicated that he was initially able to readily identify a sound strategy (drawing from the deck with best probabilities), but as the game went on, he was unable to shift to a new strategy when the contingencies changed. In healthy adults, over time, individuals are able to identify the best strategy by learning to ignore gains and focus on minimizing losses with their decision-making. Mr. Owens was initially drawn to a "good deck" (Deck D), but when he ran out of Deck D choices he could not recover and identify the next best option (Deck C). The IGT is sensitive to ventromedial frontal lobe regions that are not tapped by other measures of executive functioning.

Motivation: The test session included one formal measure of effort, specifically targeted to detect malingering. Mr. Owens performed in the valid range of this test (Dot Counting), suggesting adequate effort during the test session. Additionally, the fact that Mr. Owens performed well on the REY figure test indicated good motivation to perform

to the best of his ability.

OPINIONS AND CONCLUSIONS

In response to the referral question I was given by Mr. Owens's counsel, it is my opinion, based on a reasonable degree of neuropsychological certainty, that Mr. Owens has significant brain impairment. This opinion is supported by the following findings:

(1). Mr. Owens demonstrated difficulty with learning in a school environment despite an average range IQ throughout his schooling resulting in retention for two grades, failing grades, and eventually leaving school after the 9th grade. Learning disabilities are diagnosed when there is a significant discrepancy between IQ and achievement. Mr. Owen's school records indicated poor learning and emotional regulation throughout his records.

2. Mr. Owens demonstrated difficulty with new learning despite an average range IQ throughout his schooling resulting in retention for two grades, failing grades, and eventually leaving school after the 9th grade.

(3). Mr. Owens demonstrated borderline impairment on tasks sensitive to frontal and temporal lobe injury at previous assessment. Dr. Evans concluded that while Mr. Owens had average general intellectual abilities, he had evidence of mild brain impairment, related to frontal and temporal lobe areas. Dr. Tora Brawley reported borderline defective learning and memory and borderline manual dexterity in the context of

average IQ's. At the current assessment verbal memory remained low and deficits were noted on tasks of response inhibition and error monitoring. These findings are consistent with mild brain impairment involving the frontal and temporal lobes.

(4) Recent brain imaging, MRI and PET, are consistent with abnormal brain functioning, notably in the frontal (clinically significant) and temporal brain regions (abnormal).

Overall brain volume is at the low range of normal as assessed by MRI. However an analysis of the volume of specific brain regions indicated significant abnormalities. Notably the temporal lobe was 3 standard deviations below average in terms of volume (< 1st percentile; abnormal). The MRI details structural abnormalities and volume changes. Overall, this analysis indicated that Mr. Owens has a clinically significant smaller frontal lobe (- 1 SD) and an abnormally small temporal lobe bilaterally (- 3 SD). This pattern is consistent with test findings that there are modular or specific neuropsychological deficits related to learning (temporal) and frontal regions (motor, executive functioning) versus wide spread damage or atrophy that may lead to global deficits.

The current analysis of Mr. Owen's PET data indicated significantly different patterns of activation than one would typically predict in a default or resting state mode. This analysis demonstrated significantly lower glucose activation in hippocampus and amygdala regions, both of which are related to threat detection and aggression modulation. These regions are located in the medial temporal lobe. In contrast many areas of the cortex demonstrated increased activation. This suggests efforts to

compensate for brain regions that are hypoactive. According to Dr. Gur this suggests someone who is employing increased resources through activation of cortical regions to regulate brain regions related to emotion at rest. However, in conflict or stress this pattern may reverse resulting in less deliberative control of brain regions related to emotion. These results are also consistent with Mr. Owen's educational, neuropsychological and behavioral history.

(5) Mr. Owens has a history of seizure disorders, for which he has received treatment with Depakote. Prison records indicated treatment started in 2006. Mr. Owens is currently seizure free and no longer taking Depakote. Seizure activity is indicative of brain injury and is most commonly focused in the temporal lobe region.⁶ Further brain scans (EEG) would be required to confirm if the temporal lobes were the focus of seizure activity in this particular case. However, both neuroimaging and neuropsychological testing are consistent with temporal lobe injury.

(5) Mr. Owens has also been diagnosed with intermittent explosive disorder in the past. Intermittent explosive disorder involves repeated, sudden episodes of impulsive, aggressive, violent behavior or angry verbal outbursts in which you react grossly out of

• ⁶ Medial temporal lobe epilepsy often begins within a structure of the brain called the hippocampus or its surrounding structures. It accounts for almost 80% of all temporal lobe seizures. Epilepsy Foundation.
<http://www.epilepsy.com/learn/types-epilepsy-syndromes/temporal-lobe-epilepsy>

proportion to the situation.⁷ The cause of intermittent explosive disorder is multifocal and includes environmental risk factors (exposure to violence, trauma). The level of historic familial violence, violent criminal histories and chaos in Mr. Owens' family cannot be overstated. His childhood was fraught with violence, trauma, physical and emotional abuse and neglect. The children were removed from the home by DSS twice. Once due to a horrific beating of his sister Marie (they were placed in a shelter) and later because the children were left alone at home with no electricity, no water and no food. (See affidavits of Dora Mason, Marie Owens, Donald Andrew Owens, and Maxine Mingo.) There were literally no parental figures nor models who were not substance abusers or violent criminals or both involved in his early life. Physical abuse, neglect and trauma can impact developmental trajectories in children. For example, individuals who observe domestic violence in the home are more likely to have deficits in learning and executive functioning, lower overall IQ's, and impulsivity⁸.

In addition, in some individuals, intermittent explosive disorder has been linked to temporal lobe epilepsy. Medial temporal regions such as the amygdala are important for threat detection and mediation of aggressive behavior.⁹ Given the diagnosis and treatment of seizures in his prison medical records, neuroimaging should have at the very least been considered.

⁷ <http://www.mayoclinic.org/diseases-conditions/intermittent-explosive-disorder/basics/definition/con-20024309>

⁸ De Bollis, Hooper, & Sapia (2005) Early Trauma Exposure and the Brain, in *Neuropsychology of PTSD: Biological, Cognitive, and Clinical Perspectives*. (Vasterling & Brewin, eds.). Guilford Press.

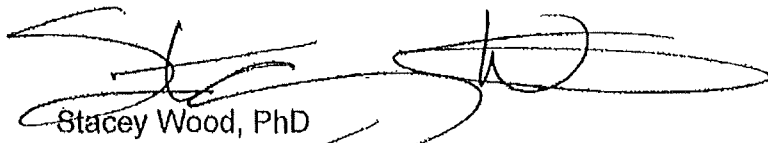
⁹ Tebarz, L. (2000) Affective aggression in patients with temporal lobe epilepsy: A quantitative MRI study of the amygdala.

Etiology of the Impairments:

As reviewed earlier, Mr. Owens has a number of risk factors for cognitive impairment including developmental elements, a history of seizure activity, mental illness, academic learning disabilities, a violent and chaotic home, and a maternal substance abuse history (likely during pregnancy). Mr. Owens reported several concussions resulting from fighting and these reports are consistent with family interview data.

Overall, the risk factors and evidence of cognitive impairment began in childhood and were present at the time of the events in question. Neuropsychological testing that was completed by Dr. Evans and Dr. Brawley indicated areas of cognitive impairment specifically in frontal and temporal regions. Current testing confirms this pattern as well. At present, there is structural evidence of decreased volume in several brain regions, notably frontal and temporal regions per Dr. Gur's report. Early indicators of brain injury were present during the developmental period and warranted further investigation. As such, the possibility of an organic cause for some of Mr. Owen's profile should have at least been considered and explored during previous phases of this matter.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Stacey Wood', with a large, sweeping flourish extending to the right.

Stacey Wood, PhD

Professor, Psychology

Scripps College, Claremont CA

Licensed Clinical Neuropsychologist, CA 16805

Figure x: Volumetric analysis of Mr. Owens' MRI. Volumes are expressed as absolute z-scores (SDs from the mean) relative to healthy individuals.

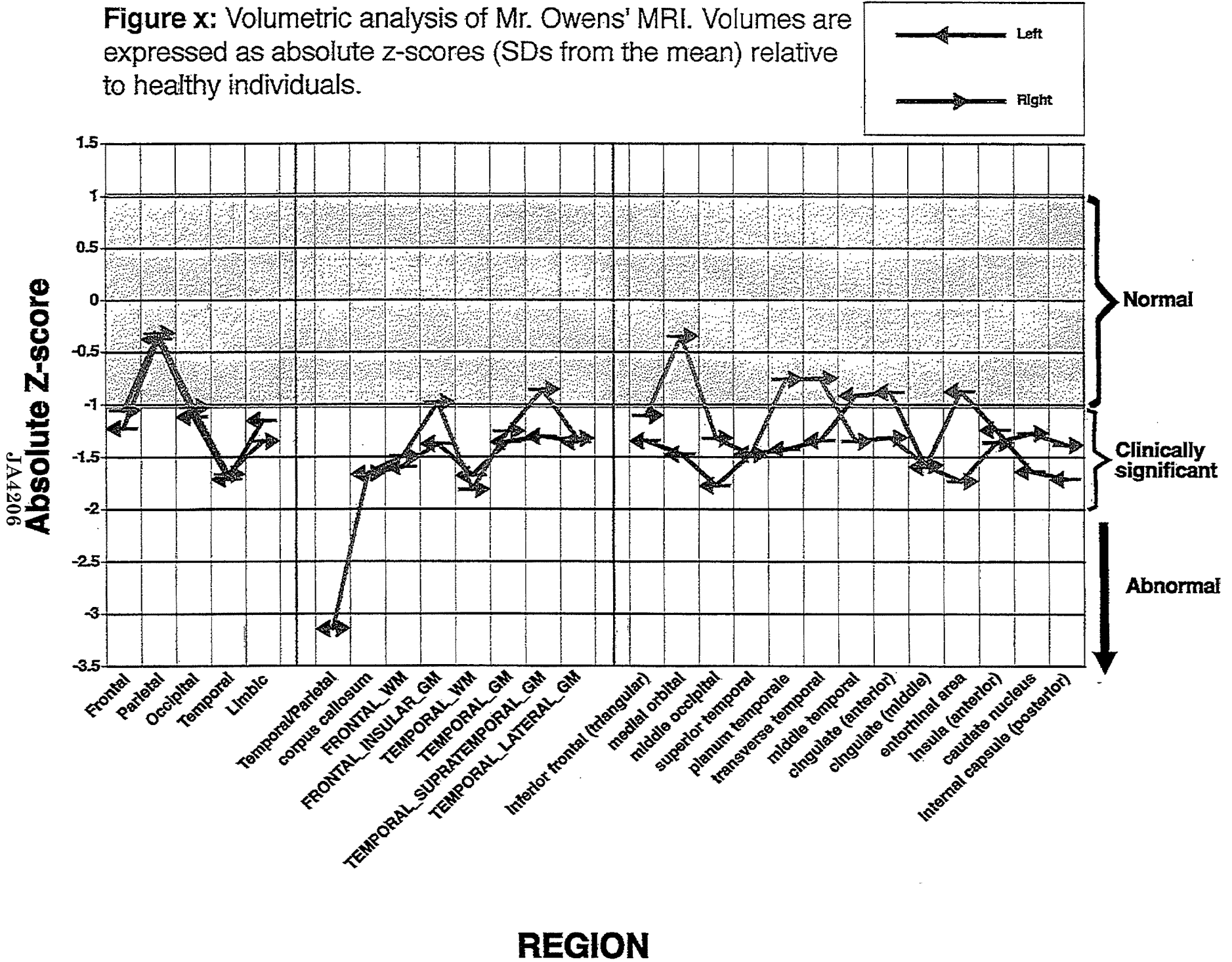
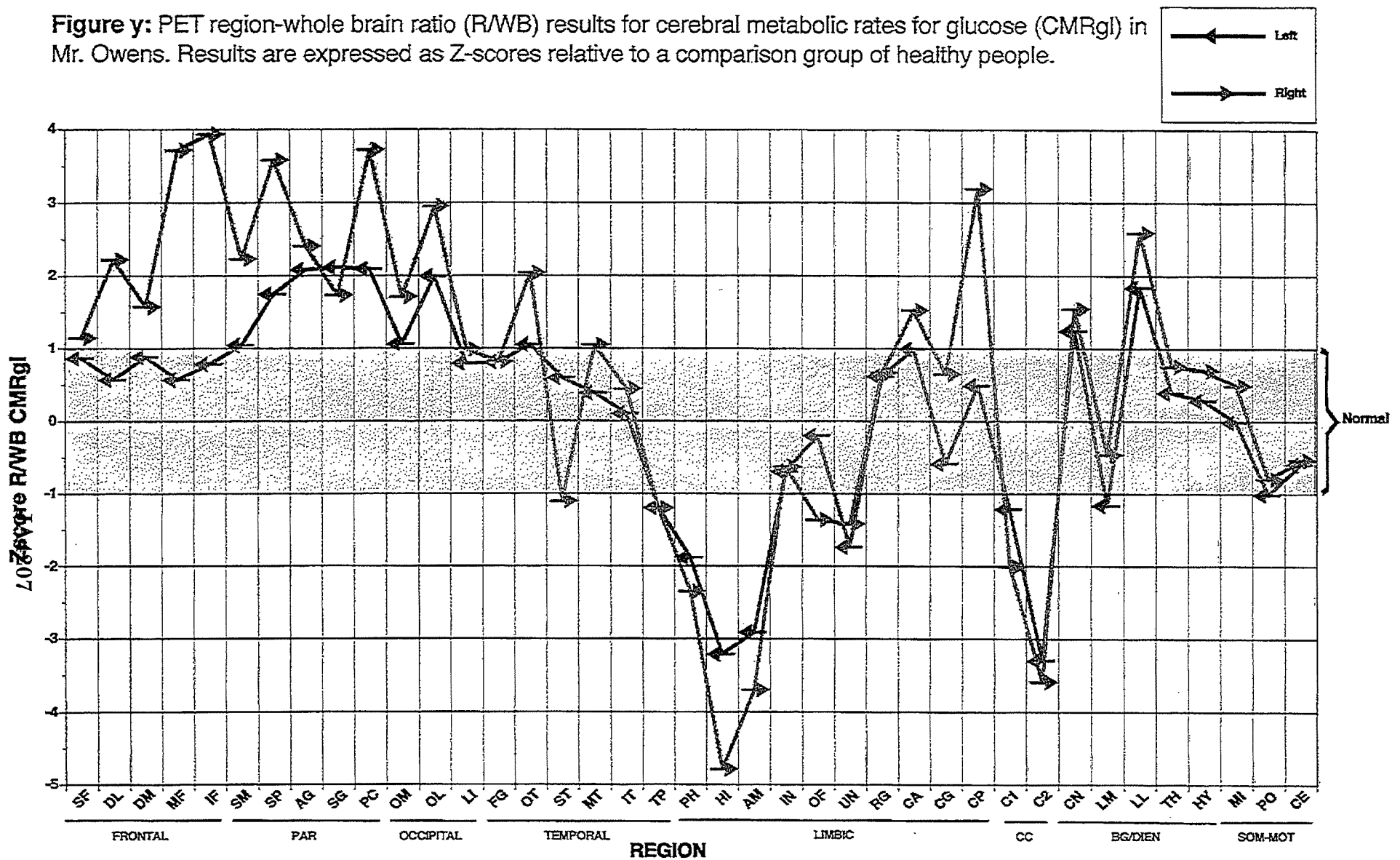


Figure y: PET region-whole brain ratio (R/WB) results for cerebral metabolic rates for glucose (CMRgl) in Mr. Owens. Results are expressed as Z-scores relative to a comparison group of healthy people.



SF = Superior Frontal; DL = Dorsal Prefrontal - Lateral; DM = Dorsal Prefrontal - Medial; MF = Mid-Frontal; IF = Inferior Frontal; SM = Sensorimotor; SP = Superior Parietal; AG = Angular Gyrus; SG = Supramarginal Gyrus; PC = Precuneus; OM = Occipital cortex, Medial; OL = Occipital cortex, Lateral; LI = Lingual Gyrus; FG = Fusiform Gyrus; OT = Occipital Temporal; ST = Superior Temporal; MT = Mid-Temporal; IT = Inferior Temporal; TP = Temporal Pole; PH = Parahippocampal Gyrus; HI = Hippocampus; AM = Amygdala; IN = Insula; OF = Orbital Frontal; UN = Uncus; RG = Rectal Gyrus; CA Cingulate Gyrus = Anterior; CG = Cingulate Gyrus - genu; CP = Cingulate Gyrus - Posterior; C1 = Corpus Callosum - Anterior; C2 = Corpus Callosum - Posterior; CN = Caudate Nucleus; LM = Lenticular - Medial [Globus Pallidus]; LL = Lenticular - Lateral [Putamen]; TH = Thalamus; HY = Hypothalamus; MI = Midbrain; PO = Pons; CE = Cerebellum.