L2 Fingerprinting the Brain: Mind, Memories, and Malingering

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Learning Overview: After attending this presentation, attendees will better understand the role of brain fingerprinting to detect concealed information in forensic criminal cases.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by informing the competence of attendees through increasing the ability to interpret an emerging scientific method used to detect concealed information stored in the brain via the use of Electroencephalographic (EEG) brain responses/brainwaves.

Between 10% and 70% of criminal defendants claim crime-related amnesia; there is limited published literature on objective assessments of memory loss in a criminal setting. Interview techniques combined with psychological testing have been developed to assess possible malingering of memory loss. Investigators have long sought a reliable means of detecting deception. The Guilty Knowledge Test (GKT) is an early predecessor to brain fingerprinting and measures the individual's autonomic response to information known or not known about a crime.[1]

Recently, brain fingerprinting techniques using brain wave response have emerged as a scientific method to detect potentially concealed information stored in the brain. Brain fingerprinting techniques measure EEG brain responses/brainwaves and compute a determination of "information present" (the subject knows the critical information) or "information absent" (the subject does not).[1] According to this theory, if the individual is familiar with the information presented, a P300 brainwave is emitted and measured by an EEG.[2]

Dr. Farwell reports that in more than 200 test cases, brain fingerprinting yielded a 100% accuracy rate with a 0% error rate in distinguishing those who possessed specific target knowledge from those who did not.[1] As an example, in an experiment on 17 Federal Bureau of Investigation (FBI) agents, analysis using this P-300 brain fingerprinting technique yielded a 100% identification rate of FBI agents with FBI-relevant knowledge.[1] Dr. Farwell has coined the term "Farwell Brain Fingerprinting" (FBF) that he proposes has the ability to detect concealed information.[1]

The application of this FBF technique to forensic criminal cases was highlighted in the 2003 case of *Harrington v. State*.[3] Terry Harrington sought to overturn his 1978 murder conviction on several grounds, including new evidence in the form of FBF that was not available at his original trial. Dr. Farwell administered his test to Mr. Harrington and rendered a report to the Iowa District Court analyzing Mr. Harrington's responses to information about the crime. Dr. Farwell asserted that his analyses supported Mr. Harrington's assertion that he was not guilty and, therefore, it should be allowed into evidence to help overturn his conviction. In contrast, the district attorney challenged these results, noting several factors that could have impacted the FBF outcome. The panel will review how the admissibility of this newly emerging FBF technique was addressed by the district and appellate courts and its impact, if any, on the legal outcome of Mr. Harrington.[4] The strengths and limitations of this approach will be discussed and admissibility under the *Daubert* standard will be highlighted.

Reference(s):

1. Farwall L.A. Brain fingerprinting: a comprehensive tutorial review of detection of concealed information with event-related brain potentials. *Cogn Neurodyn* 6:115-154, 2012.
2. Farwall L.A., Richardson D.C.; Richardson G.M. Brain fingerprinting field studies comparing P300-MERMER and P300 brainwave responses in the detection of concealed information. *Cogn Neurdyn* 7:263-299.
3. *Harrington V. State*, 659 N.W. 2d 509 (Iowa; 2003).
4. Farwell L.A., Makeig T.H. Farwell brain fingerprinting in the case of *Harrington v. State*. Indiana State Bar Assoc., Open Court X [10]:3, 7-10, 2005.

Brain Fingerprinting, Lie Detection, Malingering

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