

PET scans are one instrument among other neuroimaging techniques (e.g., functional magnetic resonance imaging (fMRI) and single-photon emission computed tomography (SPECT)) that can be used to examine the neurological function of defendants. With the advent of companies that market neuroscientific studies for legal cases and the increasing publicity on this field (e.g., National Public Radio, *Talk of the Town*, June 29–July 1, 2010), the question that this case poses is whether any neuroimaging technique meets the *Frye* standard or the *Daubert* standard of admissibility for scientific evidence.

The Society of Nuclear Medicine Brain Imaging Council (*J Nuclear Med* 37:1256–9, 1996) stated that the “use of functional imaging in forensic situations including criminal, personal injury, product liability, medical malpractice, worker’s compensation and toxic torts remains controversial.”

In a review article by Noel Shafi (*Grad Stud J Psychol* 11:27–39, 2009), neuroimaging technology can contribute to bias in the courtroom. In fact in one study in 2008, Gurley and Marcus (*Behav Sci Law* 26:85–97, 2008) presented hypothetical case summaries of defendants in criminal trials to a group of 396 participants. The participants were asked to provide a verdict of guilty or not guilty by reason of insanity (NGRI), and the participants were found more likely to render an NGRI verdict when neuroimaging techniques were presented.

In his review, Shafi looked at each neuroimaging technique and court rulings as to admissibility and reliability. Courts have found results of MRIs and computed tomographic (CT) scans to be both admissible and reliable as evidence (e.g., *State v. Vandemark*, 2004 Del. Super. Lexis 376 (Del. Super. Ct. 2001)) as well as admissible but not reliable (e.g., *United States v. Sandoval-Mendoza*, 472 F.3d 645 (9th Cir. 2006)). In the well-known case of *United States v. Hinckley*, 525 F.Supp. 1342 (D.D.C. 1981), in which Mr. Hinckley was accused of the attempted assassination of then President Ronald Reagan, CT scans were used to show atrophy in the brain, and a psychiatrist argued that this atrophy was associated with schizophrenia. The jury found Mr. Hinckley not guilty by reason of insanity, and it is likely that the CT evidence had an influence on the verdict.

With respect to functional imaging, SPECT scans were noted to have clinical and legal limitations. Granacher (*J Am Acad Psychiatry Law* 36:323–8, 2008) commented that “the reliability of SPECT. . . when

applied forensically to mild TBI or TBI cases, will not meet all *Daubert* criteria” and that “general acceptance . . . has not been achieved.”

PET scans have faced similar limitations; however, PET and SPECT scans have high rates of admissibility. Feigenson (*Int J Law Context* 2:233–55, 2006) stated that “PET and/or SPECT evidence has been admitted in more than four-fifths of cases” and that there have been over 130 court opinions involving PET and SPECT evidence in federal and state courts.

*Zink* highlights the controversy over admissibility of neuroimaging evidence and shows its forensic limitations. The course of appeals in *Zink* is not over. Further appeals await decisions in the federal courts. There, the evidentiary value of neuroscientific methods will be further tested. *Zink* is one among many cases in which the influence of neuroscience in the courtroom has been challenged.

Disclosures of financial or other potential conflicts of interest: None.

## Repressed Memories in a Controversial Conviction

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### State Supreme Court Denies Motion for a New Trial and Affirms Admissibility of Evidence Based on Memories Recovered After Dissociative Amnesia

In *Commonwealth v. Shanley*, 919 N.E.2d 1254 (Mass. 2010), the Supreme Court of Massachusetts affirmed the judgment of the superior court denying a motion for a new trial, holding that due to the evolving nature of the scientific debate on the validity of repressed memories, expert witness testimony supporting the notion of dissociative amnesia was admissible under the *Frye* test. The conviction of Paul Shanley, a Catholic priest, on the basis of the plaintiff’s recently recovered memories of childhood sexual abuse was upheld.

*Facts of the Case*

Fr. Shanley was charged and convicted on two counts of the sexual abuse of a child. His conviction was based on the testimony of the victim, who at the time of trial in 2005 was a young adult male. The victim claimed to have recovered previously repressed memories of sexual abuse that had occurred when he was a child.

In late January 2002, while he was serving as an Air Force police officer, the victim's girlfriend brought to his attention an article in a Boston newspaper alleging that Fr. Shanley had sexually abused children. The victim expressed surprise and began to recall some of his interactions with Fr. Shanley, specifically being taken out of classes by him for disciplinary reasons on many occasions between the ages of 6 and 12 years. He looked up online articles about the allegations as well as photographs of Fr. Shanley, but had no disturbing memories at that point.

Some weeks later, the victim learned that one of his childhood friends and former classmates had joined in the allegations against his former priest. This led the victim to contact his childhood friend and then to contact a civil defense lawyer, whom he later retained. He also went to see an Air Force psychologist to talk about his troubled state of mind. The psychologist temporarily disqualified him from performing his military duties and also told him to start a written journal about his memories of Fr. Shanley.

At trial in 2005, the victim testified that Fr. Shanley had sexually abused him on numerous occasions. He recovered memories of Fr. Shanley touching his penis and anus. He had not recalled any of the childhood abuse until reading about the allegations of others and interacting with his childhood friend, which happened nearly 13 years after the alleged offenses.

In April 2003, the victim received an honorable discharge from the military, owing to his emotional state. After joining a civil suit against the Archdiocese of Boston based on his allegations of sexual abuse, he ultimately received a settlement of \$500,000.

At Fr. Shanley's trial, the Commonwealth called expert witnesses in support of the claim that the victim's childhood memories of sexual abuse could be repressed for long periods and then be reliably recovered. One of these experts was psychiatrist Dr. James Chu, chief of clinical services at McLean Hospital in Boston and an expert in dissociative amnesia. Dr.

Chu testified that dissociative amnesia is a *bona fide* DSM-IV diagnosis and that although it is uncommon in the general population, it is "not at all rare" (*Shanley*, p 1260). He described traumatic amnesia and the means by which some repressed memories were recovered. He acknowledged that while all memories are subject to distortion, "the central themes of memories are really relatively well-preserved" (*Shanley*, p 1261). On cross-examination, Dr. Chu admitted the possibility that false information could be created in certain individuals, but that "only a very small minority of people" would be susceptible to implanted false memory.

Fr. Shanley's defense team argued that the abuse never actually happened. They asserted that the alleged victim had a lot to gain financially and personally by fabricating a history of sexual abuse. They also argued that the theory of repressed memory was unsupported and that if the alleged abuse could not be corroborated by other reliable sources, it would be impossible to prove whether the memory was truly based in reality. This final facet of the defense strategy was bolstered by another expert witness, Dr. Elizabeth Loftus, a well-known psychologist.

Dr. Loftus testified regarding experiments she and her colleagues had conducted regarding the reliability of eyewitness accounts and how the accuracy of the accounts could be distorted by misinformation. She testified that there was "no credible scientific evidence for the idea that years of brutalization can be massively repressed," and stated that exposure to retrospective media coverage of a subject can distort an individual's memory of an event or supplant it entirely. Moreover, she stated that any method of study based solely on the self-report of a person is inherently limited due to lack of corroboration (*Shanley*, p 1263).

*Ruling and Reasoning*

Despite defense objections to the admission of the Commonwealth's repressed memory expert testimony, the trial judge admitted the contested evidence. That testimony and the testimony of the victim and other lay witnesses led to the conviction of Shanley in February 2005. A motion for a new trial was filed, with the defense appeal contending, among other things, that the judge had erred in admitting expert testimony related to "repressed memory."

The state supreme court reviewed the gate-keeping function of a trial court judge with respect to the

admissibility of expert witness testimony. In the state of Massachusetts, a necessary condition for the admission of expert testimony is that it be shown to be reliable. It must therefore meet one of two conditions: general acceptance in the relevant scientific community (i.e., the *Frye* test, as set forth in *Frye v. United States*, 293 F. 1013 (D.C. 1923)), or the “alternative requirements adopted in *Lanigan*,” another case in Massachusetts that dealt with the admissibility of scientific expert testimony (*Commonwealth v. Lanigan*, 641 N.E.2d 1342 (Mass. 1994)). This second basis for admissibility is assessed at a pretrial *Lanigan* hearing. In the criminal trial of Fr. Shanley, a pretrial *Lanigan* hearing was indeed held that extended over five days.) The Commonwealth called another expert witness, Dr. Brown, who testified in support of the phenomenon of dissociative amnesia, as well as its general acceptance in the field of psychology. The defense counsel argued against the theory, asserting that there was no reliable means of confirming its existence. At its conclusion, the trial court judge found that evidence supporting amnesia in cases of childhood sexual abuse met the standard for general acceptance in the scientific community.

On appeal, the defense argued that the judge’s conclusion on this matter was in error, given that there is little peer-reviewed literature validating repressed memory. In its review, the supreme court affirmed the findings of the lower court, stating that Dr. Brown had given ample evidence of peer review in his testimony to meet the *Frye* standard for general acceptance. On several occasions, the state supreme court also pointed out that there was no legal precedent requiring absolute agreement among relevant scientists. “A relevant scientific community must be defined broadly enough . . . so that the possibility of disagreement exists” (*Shanley* quoting *Canavan’s Case*, 733 N.E.2d 1042 (Mass. 2000)). The lower court’s order denying the motion for a new trial was upheld in the appellate review.

#### Discussion

The debate in *Shanley* focused on whether the phenomenon of dissociative amnesia exists in a population of individuals who were traumatized as children or whether present-day suggestion of the possibility of past abuse might inadvertently create distorted or entirely implanted notions about one’s history. Given the ethics-related and practical difficulties inherent in testing such a theory, this debate

may not soon be resolved. However, a more practical question put to the court in this case was how to resolve the question of reliability with regard to scientific testimony, and in the end, both the lower and higher courts resolved it by drawing on the principle of general acceptance, as first proposed in *Frye* in 1923. It is our contention that the state’s almost exclusive focus on general acceptance led to the admission of expert testimony that would not pass muster under the more contemporary standard for scientific reliability set forth in *Daubert* (*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)), which is a Federal standard, but not yet a unanimously adopted precedent in the state courts. Paradoxically, this newer standard is championed in *Lanigan*, the benchmark Massachusetts case for scientific reliability, as a sound alternative to the general-acceptance rule, although the ambiguity of the language used therein reveals that Massachusetts law is still a confusing amalgamation of two standards:

The ultimate test, however, is the reliability of the theory or process underlying the expert’s testimony. . . . Thus we have recognized the risk that reliable evidence might be kept from the fact finder by strict adherence to the *Frye* test. . . . We accept the basic reasoning of the *Daubert* opinion because it is consistent with our test of demonstrated reliability. We suspect that general acceptance in the relevant scientific community [the *Frye* test] will continue to be the significant, and often the only, issue [*Lanigan*, p 25].

If Fr. Shanley had been tried under the *Daubert* standard, with admission only of scientific testimony that was quantifiable, testable, and ultimately more helpful to the trier of fact, the state’s expert testimony might well have been excluded. That testimony served to bolster the credibility of the victim. Absent such vouch saving, the jury might well not have found the victim’s claims credible to the beyond-a-reasonable-doubt standard. Scientific evidence would have assisted the jury in deciding whether dissociative amnesia could be accurately diagnosed in a given person (such as the alleged victim), absent corroborating evidence from the past. Because of the admission of *Frye*-tested evidence on repressed memory, Fr. Shanley was convicted based solely on memories of abuse that the plaintiff “recovered” after years of dissociative amnesia. Given this, we cannot assume that the trier of fact would be able to ferret out the difference between the conjectures of experts and reliable scientific evidence.

Disclosures of financial or other potential conflicts of interest: None.