

A Skeptical Look at a Remarkable Case Report of 'Overnight' Amnesia

Extraordinary Symptoms, Weak Evidence, and a Breakdown in Peer Review

A peer-reviewed article reporting a bizarre and previously unknown form of amnesia imparts valuable scientific lessons: poorly documented case reports can confuse as well as enlighten, and we should be skeptical of clinical claims modeled after Hollywood plots. It also reminds us why scientific journals need to allow for the self-correction of questionable claims.

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Well-documented case reports have substantial value. As Davison and Lazarus (2007) note, case reports can raise useful questions about theories, provide preliminary data to be tested in more rigorous investigations, and “permit the investigation, although poorly controlled, of rare but important phenomena” (157).

Nevertheless, case reports of novel clinical phenomena have their limitations, especially when presented without adequate documentation. As Loftus and Guyer (2002) observed in an article in the *SKEPTICAL INQUIRER*, case studies “illuminate, but can also obscure the truth. In many cases, they are limited by what their reporter sees, and what their reporter leaves out. . . . To the scientist, therefore, most case studies are useful largely to generate hypotheses to be tested, not as answers to questions” (26).

To illustrate the problems of poorly documented case reports, we analyze a recent report by Smith et al. (2010) of a purportedly new and exceedingly strange memory disorder. This case was pub-

lished in *Neuropsychologia*, one of the world's premier outlets for neuropsychological articles.

The Apparent Discovery of a Remarkable New Form of Amnesia

Smith and colleagues (2010) described an extraordinary and unique constellation of memory aberrations. Their patient—a fifty-one-year-old woman referred to as “FL”—was involved in a car accident in 2005, during which she briefly lost consciousness. FL reported that since then she accumulates memories continually during the day but then loses all of them after one night of sleep. That is, she experiences overnight amnesia, so she must start afresh with

a “blank slate” when she awakens each morning. The investigators noted that FL's symptoms mimicked the scenario of the 2004 romantic comedy *50 First Dates*, in which one of the characters, Lucy (portrayed by Drew Barrymore), suffers from overnight amnesia following a car accident.

Soon after the publication of Smith et al.'s case study, a number of websites rushed to publicize it. The website *Neurocritic* noted that Hollywood has a long and checkered history of presenting cases of amnesia that bear no resemblance to reality, but “that isn't true anymore.” The British Psychological Society's *Research Digest* reported that “psychologists have documented what they believe to be a clinical first—the case of an amnesic woman whose memory for new material is erased each night that she goes to sleep.” What is notable about these and other web reports is that they were virtually all offered without even a hint of skepticism. In turn, these uncritical descriptions were picked up verbatim by numerous other websites.

The Limitations of Smith et al.'s Case Report

As we will see, all of these reports neglected to mention a crucial fact: the Smith et al. case report was marked by three major limitations.

Limitation #1: Lack of Crucial Background Information

The level of detail regarding FL's case description is unsatisfactory. The authors inform us that despite FL's severe memory impairments, "she was able to return to her previous employment after some accommodations were made at work" (Smith et al. 2010, 2834). It is difficult to

Still other information provided by the authors is uninformative. For example, the fact that the patient failed to recover memories of the time after the accident while under hypnosis (2834) does not offer evidence that such memories were inaccessible to her. Hypnosis, despite popular misconception, is not a dependable technique for recovering lost memories (Lynn et al. 2003).

Smith et al. mentioned in passing FL's involvement with the legal system following her accident. Nevertheless, they do not provide adequate details concerning this involvement. For example, did FL file a personal-injury claim?



Columbia Pictures/Michaels, Darren/Album/Newscom

50 *First Dates* depicts a case of "overnight" amnesia that has no basis in science.

imagine any job in which recollection of all information gained after a specific date (in this case, after FL's car accident) is inessential. Furthermore, the article suffers from a striking paucity of information about FL's work accommodations: did they involve lessened responsibility, fewer working hours, longer breaks, more assistance, and so on? If so, such privileges might constitute an important motive for feigning memory impairments.

As appropriately skeptical readers, we need to know to what extent FL's overnight amnesia adversely affects her everyday functioning. Nevertheless, Smith and colleagues apparently did not attempt to contact co-workers or friends to confirm that FL's presumed memory loss has affected her daily behaviors.

Research shows that a litigation context is associated with symptom exaggeration and misrepresentation (Faust 1996; Tolin et al. 2004). Indeed, Iverson (2005) found that patients involved in litigation display substantially lower neuropsychological performance (that is, lower scores on standardized measures of memory, attention, and problem-solving) than comparable patients who are not. This pattern suggests that their scores on neuropsychological tests may partly reflect attempts to persuade others (such as attorneys and jurors) that they deserve financial compensation.

Limitation #2: Failure to Exclude Feigning or Inadequate Motivation

A second limitation of Smith et al.'s case report is their failure to rule out

feigning or a lack of motivation to remember new material (see Carone et al. 2010). In their case description, Smith and colleagues dismissed the possibility of feigning by arguing that "it was the impression of those who worked with FL that she believed that she had the memory impairment that she described" (Smith et al. 2010, 2839). Yet this reassurance is unsatisfying because subjective clinical impressions alone are known to be grossly insufficient for detecting the feigning of disorders (Rosen and Phillips 2004).

Smith et al. administered several memory tests to FL as well as to healthy participants who were instructed to simulate overnight amnesia. In many respects, the performances of the simulators paralleled that of FL, which should give us pause when interpreting the claim that her amnesia is genuine. The authors also administered several memory tasks that involved tests of learned materials following a delay of twenty-four hours. When they tested FL's delayed memory covertly—in a way that was not transparent to her—there were clear indications that despite her purported memory difficulties, FL could reproduce material that was presented on the previous day. This performance pattern flies in the face of the overnight amnesia syndrome attributed to FL.

To their credit, Smith et al. did administer Warrington's (1984) "Recognition Memory Test for Words and Faces" to FL. She obtained a score of 41 on the immediate recognition test; using a cutoff score ascertained in a recent study (Kim et al. 2010), this low score provides preliminary evidence that FL exerted low levels of effort on the neuropsychological tests she was administered. Nevertheless, the authors of her case description apparently overlooked this worrisome indication.

Limitation #3: Lack of Connectivity with the Scientific Literature

Absence of connectivity (Stanovich 2009), a key indicator of questionable science, occurs when investigators neglect the existing corpus of scientific knowledge. Indeed, from both scientific and

theoretical perspectives, Smith et al.'s case description is puzzling. There is no known mechanism whereby memories can be acquired during the course of a day only to be wiped clean after a night's sleep. Moreover, an abundance of literature demonstrates that certain sleep stages promote memory consolidation, whereas sleep deprivation impedes it (Walker and Van der Helm 2009). Yet Smith et al. inform readers that following a sleep-deprivation protocol, FL's amnesic deficit somehow disappeared and that "her husband reported that she awakens 3.5 h into each night's sleep and has been able to retain her memory for successive days with this regimen" (Smith et al. 2010, 2834).

The authors' sleep-deprivation protocol could have afforded them a powerful tool to falsify their hypothesis. What would have happened if the treatment team allowed FL to sleep for only three-and-a-half hours or less but informed her that she had slept for six hours or more? If FL had continued to claim a lack of memories despite sleeping for only three-and-a-half hours or less, this finding would have pointed strongly in the direction of a persistent belief in amnesia in its absence or feigning amnesia rather than amnesia *per se*.

Hollywood and Amnesia

As we have already noted, FL's memory loss is suspiciously similar to that of Drew Barrymore's character in the film *50 First Dates*. Interestingly, FL saw the movie several times after her accident, and she reported that Drew Barrymore was her favorite actress. Smith et al. acknowledged that FL's multiple viewings of the film may well have shaped her beliefs about memory and, in turn, her amnesic symptoms. In the authors' words: "The idea that memories can disappear overnight became popularized by a fictional film and may have influenced FL's concept of how memory could fail after a car accident" (Smith et al. 2010, 2839).

Thus, according to Smith and colleagues, FL's amnesia may reflect her *belief* that a person can lose all newly acquired memories after a night of sleep.

This belief, in turn, may explain the paradox of FL's reporting that she loses all of her memories overnight co-existing with her ability to retain the previous day's knowledge when demonstrated on covert testing.

This analysis is logically confused. The term *amnesia* indicates a condition that can be objectively documented and goes beyond a mere *belief* patients hold about their memories (see Read and Lindsay 2000). If FL only *believes* that she suffers from a memory impairment, and her memory actually functions largely within the normal range, her condition would more accurately be described as pseudo-amnesia, not amnesia.

other paranormal abilities. Ironically, Baxendale singled out *50 First Dates* as an especially egregious example of Hollywood's unscientific portrayal of memory loss, observing that this film "maintains a venerable movie tradition of portraying an amnesic syndrome that bears no relation to any known neurological or psychiatric condition" (Baxendale 2004, 1480).

Avoiding Erroneous Conclusions in Case Reports: Thinking Bayesian

Truzzi's (1976, 1978) and Sagan's (1995) maxim that extraordinary claims require extraordinary evidence makes good sense from a Bayesian standpoint, a statistical and conceptual approach

If FL only *believes* that she suffers from a memory impairment, and her memory actually functions largely within the normal range, her condition would more accurately be described as pseudo-amnesia, not amnesia.

Baxendale (2004) noted that the overwhelming majority of films that portray amnesia do so in a grossly inaccurate fashion—with the 2000 film *Memento* being a noteworthy exception (see also Lilienfeld et al. 2010). For example, many films depict people with amnesia following brain trauma as having no recollection whatsoever of their identity or past, when in fact such complete loss is exceedingly rare. Other films erroneously depict people who develop amnesia as acquiring remarkable—even superhuman—powers, including extrasensory perception and

that takes *a priori* plausibility into account when evaluating the likelihood of claims. The base rate (prevalence) of extraordinary phenomena is by definition extremely low (Atwood 2008; Goodman 1999). If a memory disorder like overnight amnesia exists, its prevalence is surely tiny relative to that of feigning, especially when real-world privileges or judicial outcomes are potentially at stake. As a consequence, the evidence needed to conclude that such a syndrome is present should be overwhelming. As medical students learn, "When you hear hoofbeats, think horses, not zebras," an

admonition to "think Bayesian" when evaluating the likelihood of diagnostic possibilities (Groopman 2007).

Wedding and Faust (1989) advised neuropsychologists to "not become overly focused on the esoteric" (258) and noted that clinicians' preoccupation with uncommon features is an obstacle to sound clinical judgment. In the case of FL, the scientific guideline of Occam's razor urges us to assign much higher probab-

able, it is at the very least incumbent on authors to be circumspect in their conclusions.

Lesson 2: Widely Viewed Television Programs and Films May Influence the Presentation of Patients' Symptoms

Psychologists and psychiatrists have long recognized that certain disorders are partly iatrogenic in origin: that is, they can be inadvertently induced by well-

that *Sybil* triggered the dramatic increase in DID cases, there are good circumstantial reasons to believe that the film played at least some causal role. For example, prior to *Sybil*, remarkably few individuals with DID reported a history of child abuse; following *Sybil*, the overwhelming majority did (Spanos 1996). Moreover, although most cases of DID prior to *Sybil* reported only one or two alter personalities, the mean number of DID cases in post-*Sybil* reports was much higher—in one study it was sixteen, precisely the number reported by *Sybil* (Ross et al. 1989).

Clinicians who work with individuals who report disturbances in memory and identity must therefore be cognizant of the possibility that their patients' symptoms can be shaped by Hollywood depictions (Baxendale 2004). Because many of these portrayals are wildly inaccurate from a scientific standpoint, clinicians may be duped into accepting telegenically induced symptoms—which are merely modeled after Hollywood depictions—as reflecting entirely "new" disorders.

Lesson 3: Permit Researchers to Submit Critiques of Case Reports in the Peer-Reviewed Literature

Editors and reviewers play crucial gatekeeper roles in evaluating whether case reports of patients displaying spectacular symptoms 1) provide sufficient detail, 2) rule out alternative explanations, 3) build on existing scientific findings and theories, and 4) refrain from launching premature diagnostic entities. Nevertheless, if journal editors elect to accept case reports even when they are suboptimal in one or more of these respects, they must at the very least afford critics the opportunity to articulate the shortcomings of those reports.

Remarkably, the journal that published the Smith et al. case, *Neuropsychologia*, does not accept commentaries on its case reports (or other empirical articles) and refused to even consider a rebuttal of Smith et al.'s case report for publication. Compounding the problem, several other journals (perhaps understandably) refused to consider publishing a commentary on the Smith et al.

If the existence of an entirely new form of amnesia in [FL's] case were to be confirmed, it would not only herald the discovery of a new disorder but challenge existing models of memory loss.

ity to alternative explanations for her amnesia than to overnight amnesia.

Three Scientific Lessons Imparted by the Smith et al. Case Report

Lesson 1: Welcome the Publication of Case Reports, but Insist on Adequate Documentation

The case report of FL is certainly intriguing. If the existence of an entirely new form of amnesia in her case were to be confirmed, it would not only herald the discovery of a new disorder but challenge existing models of memory loss. Nevertheless, it is difficult to justify the publication of Smith et al.'s report in its present form given the absence of crucial details and failure to rule out plausible rival hypotheses for FL's symptoms. As a general rule, journals should insist on high standards of objective documentation when publishing case reports of rare or unusual phenomena. If such documentation is unavail-

meaning, but mistaken, psychological or medical treatment (Lilienfeld 2007). The case of FL reminds us, however, that in today's media-driven world, some disorders may be what we term telegenic in origin: induced at least partly by television, films, and news and entertainment media.

Dissociative identity disorder (DID), formerly called multiple personality disorder, is a likely case in point of a telegenic disorder (see Byrne 2001). Prior to 1970, there were fewer than 80 such cases reported in the world literature. Nevertheless, following the 1976 made-for-television film *Sybil* that starred Sally Field, who portrayed a real-life woman with a history of severe child abuse who supposedly possessed sixteen personalities (but see Rieber et al. 2002 for data calling the *Sybil* case into question), the number of DID cases skyrocketed into the thousands (Boor 1982). Although this finding does not prove

case report on the grounds that it had appeared in a different journal.

Neuropsychologia's misguided editorial policy deprives science of one of its most valuable safeguards: self-correction (see Beyerstein 1995). When journals do not allow authors to submit critiques of case reports, they short-circuit the essential role of the peer scientific community in scrutinizing remarkable claims. In turn, they may permit questionable information to make its way into the peer-reviewed and popular literatures, allowing dubious conclusions to be disseminated with minimal qualification. The result, we suspect, is often little more than scientific obfuscation.

Postscript: Another Case of Telegenic Amnesic Syndrome?

Soon after we completed the initial draft of this article, co-author Thomas Merten saw a patient in a hospital's neurology ward: a twenty-three-year-old male found by his girlfriend in the bathroom following a brief period of reported unconsciousness the previous week. He claimed not to recognize her or anyone else and to have no recollection of his identity. Oddly, he exhibited neither signs of marked brain damage on neuroimaging nor any neurological or neuropsychological symptoms on standardized testing. Yet the man reported that he had lost all memories, plus all of his learned abilities, such as knowing how to open a can. At the conclusion of the interview, he reported that during his previous weekend at home he had watched the movie *50 First Dates* with his girlfriend. She informed him they had seen it several times in the past, but he claimed to have no memory of it.

If our speculations about "telegenic amnesic syndrome" are correct, this postscript may end up being merely the pilot episode of a host of others to follow. As they say in the television world, stay tuned. ■

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