

COMMONWEALTH OF MASSACHUSETTS

MIDDLESEX COUNTY

SUPERIOR COURT DEPARTMENT  
NO. MICR2002-00894

_____	)
COMMONWEALTH OF	)
MASSACHUSETTS	)
	)
v.	)
	)
PAUL R. SHANLEY	)
_____	)

**AFFIDAVIT OF ELIZABETH LOFTUS, Ph.D.**

I, Elizabeth Loftus, Ph.D., hereby depose and state:

1. I have been asked to submit this affidavit and address the current state of scientific evidence on particular aspects of memory suggestibility, false memories, and the reliability of memory. I have also been asked to convey whether scientific evidence supports the reliability of mental cognition believed by a subject to be a “recovered memory” of a traumatic event that was “suppressed” through “dissociation” or “amnesia” from decades earlier.

**Professional Background**

2. This affidavit is based on my extensive experience as a scientist who creates, conducts and reviews studies on human memory that are grounded in the scientific method. I am readily familiar not only with what my own scientific studies have demonstrated about human memory, but what the evidence from the scientific community has demonstrated to date.

3. I am Distinguished Professor at the University of California, Irvine. I hold positions in the Department of Psychology and Social Behavior, as well as the Department of Criminology, Law and Society. My Ph.D. is in Psychology from Stanford. I am an author of more than 350 published papers, the majority of which concern the topic of human memory. I have published 20 books, at least five of which deal almost exclusively with the subject of memory, including a college textbook called *Human Memory*. I have received five honorary doctorates for my research on memory, two from universities in the United States, two from universities in Europe, and one from a University in Israel. I was elected to the National Academy of Sciences and the American Philosophical Society in recognition of my long-standing research program on human memory. I have held tenured academic positions at major universities, and in that capacity I have taught courses in human cognition and memory at the university level for more than 30 years.

4. I am the former President of the Association for Psychological Science (formerly the American Psychological Society) and was twice President of the Western Psychological Association. I have given hundreds of invited addresses throughout the world, primarily on the topic of memory. I have provided many presentations to judges, prosecutors and defense attorneys in the United States. My consulting work has included government agencies including the United States Department of Justice. For well over three decades I have received funding in support of scientific studies conducted by my laboratory.

Funding sources have included the National Science Foundation, the National Institute of Mental Health, the National Institutes of Health, the General Services Administration, among many others both public and private. The attached *curriculum vitae* (Exhibit A) provides a summary of my experience and qualifications in psychology more generally, and human memory in particular.

**Prior Testimony**

5. I did not act as a consultant on this case for pretrial purposes, nor was I called to testify at any pretrial proceedings meant to address the current scientific understanding of human memory. It was my understanding that others were acting as experts during the pretrial phase of this case; I was not asked, nor did I ever consider, travel to Boston before the actual trial in this matter, and recall nothing more than brief and casual conversation by telephone on limited occasions with the defense attorney before I actually arrived in Boston for the trial.

6. I was called to testify and did testify at trial for the defense. During the trial my testimony was limited to responding to the questions posed and I do not believe a thorough or adequate presentation of the scientific understanding of human memory (suggestibility, reliability, or whether “repressed memory” is supported by science) was presented through my testimony. During cross-examination the prosecutor asked me questions that suggested a confounding of normal forgetting and remembering with what is commonly referred to as “repressed” and later “recovered” memory (the

purported massive repression of some trauma, an inability to remember that trauma, and then a recovery of “repressed memories” of that trauma). However, because there was no redirect examination, these erroneous suggestions by the prosecutor were not corrected and were reemphasized in her closing argument to the jury. The prosecutor also asked questions suggesting that some studies I was involved in suffered from significant shortcomings or intentionally ignored certain data from prior studies, assertions with which I vigorously disagree. In the absence of a redirect examination these suggestions also went without clarification.

7. After the trial I learned that I was the only witness called for the defense. In my opinion, this was ill advised because my testimony is properly directed to the scientific study of memory and memory suggestibility primarily outside of a therapeutic context. As I testified during the trial in response to questions from the prosecutor: I am not a clinician; I cannot speak to the diagnostic process; I do not treat and have not treated patients; I do not have expertise with the DSM-IV. Testimony as to scientific evidence and how it relates to or informs assertions that arise from clinical studies, or about diagnoses, or about many therapeutic matters should be provided by a scientist with experience as a clinician. Testimony focused upon clinical treatment or concerned with observations arising from a clinical setting should be provided by a clinician.

**It Is Well Established That Suggestion Can Both Distort  
And Create Wholly False Beliefs And Memories**

8. Contrary to the notion that memory works like a videotape recorder, the past decades of scientific study have not only established the malleability of memory, but have shed great light upon what is a thin line separating human memory from human imagination. More than 30 years of scientific research comprising thousands of studies have demonstrated that it is relatively easy for existing autobiographical memories to be modified or distorted, and for entirely false autobiographical memories to be created.

9. Across many laboratory studies utilizing strong forms of suggestion in a paradigm known as “familial informant false narrative procedure,” or the “lost in the mall” technique (Lindsey et al. 2004, Loftus 2003, Loftus and Pickrell 1995), an average of 30% of subjects have developed partial or complete false beliefs or memories (Lindsey et al. 2004). These false beliefs or memories have involved both ordinary and traumatic events, such as riding in a hot air balloon (Wade et al. 2002), being lost in a mall for an extended period of time (Loftus 1993), having an accident at a family wedding (Hyman et al. 1995), being the victim of a vicious animal attack (Porter et al. 1995), nearly drowning and having to be rescued by a lifeguard (Heaps and Nash 2001), among many others. Some subjects developed false memories right away, while others begin with little memory but after repeated suggestion begin to recall false events in great detail (Ost et al. 2005).

10. Some have criticized the studies by suggesting that perhaps the events being reported actually did occur, and are true memory reports not false ones. This criticism was addressed in studies such as Braun et al. 2002, Grinley 2002 and Braun-LaTour et al. 2004, in which the impossible event of meeting a Warner Brother's character (Bugs Bunny) at a Disney resort was remembered. Memories included shaking Bug's hand, hugging him, touching his ear, touching his tail, remembering that he was holding a carrot, and hearing him say "What's up doc?" The criticism involving the degree of trauma has been widely addressed in studies that have implanted memories of experiences ranging from the unpleasant to the traumatic, such as hospitalizations, enduring medical procedures and near drowning. Studies have even implanted false memories of the strange and dramatic, such as witnessing the demonic possession of a child (Mazzoni, Loftus and Kirsch, 2001).

**Scientific Studies Have Demonstrated That Wholly False Memories Can Be Experienced As If Genuine Recollections, Replete With Sensory Detail, Confidence & Emotion**

11. Scientific studies have established that wholly false memories about the past may result in *rich false memories*. *Rich false memories* are memories which create a subjective feeling that one is experiencing a genuine recollection, replete with sensory details, expressed with confidence and emotion, even though the event never happened. As an example, one such study demonstrated that people with memories of being abducted by aliens, in some cases involving sexual intercourse with aliens, had physiological reactions similar to those who

suffered from true traumas when listening to scripts of about their experiences (McNally, 2003). McNally of Harvard University notes that these findings underscore “the power of belief to drive a physiology consistent with actual traumatic experience.” As another example, a subject received the suggestion that he or she went to the hospital at age 4 and was diagnosed as having low blood sugar (Ost et al. 2005). At first the subject remembered very little: “... I can’t remember anything about the hospital or the place. It was the X general hospital where my mum used to work? She used to work in the baby ward there... but I can’t... no. I know if I was put under hypnosis or something I’d be able to remember it better but I honestly can’t remember.” Yet in the final interview in week three, the subject developed a more detailed memory and even incorporated thoughts at the time into the recollection: “... I don’t remember much about the hospital except I know it was a massive, huge place. I was five years old at the time and I was like ‘oh my God I don’t really want to go into this place, you know it’s awful’ ... but I had no choice. They did a blood test on me and found out that I had a low blood sugar...”

12. False implanted beliefs have been shown to have repercussions affecting later interests, preferences, attitudes, thoughts and intentions (Bernstein et al 2005).

### **The Misinformation Effect & Conditions of Susceptibility**

13. A large body of scientific study on memory over the past quarter century has been focused upon the *misinformation effect* – a name given to the

change in reporting that arises after receipt of misleading information. In 2005 the Journal *Learning & Memory* published a major piece of experimental work using neuroimaging to reveal the underlying mechanisms of the *misinformation effect* (Okado and Stark, 2005).

14. Scientific studies on the *misinformation effect* have made key findings in many important areas over several decades, two of which concern the conditions in which people are particularly susceptible to the negative impact of misinformation, and whether some people are particularly susceptible.

15. Long ago researchers showed that certain conditions are associated with greater susceptibility to misinformation. So, for example, people are particularly prone to having their memories be affected by the misinformation when it is introduced after the passage of time has allowed the original event memory to fade (Loftus et al. 1978). One of the reasons this may be true is that with the passage of time, memory of the actual event is weakened, and therefore there is less likelihood that the discrepancy is noticed while the misinformation is being processed. Where there are lengthy intervals between an event and subsequent misinformation, the event memory might be so weak that it is as if it had not been presented at all. The proposal of a fundamental principle for determining when changes in recollection after misinformation would occur is known as the *discrepancy detection principle* (Tousignant et al. 1986), which essentially states that recollections are likely to change if a person does not

immediately detect discrepancies between misinformation and memory for the original event.

16. It is also established that misinformation affects some people more than others. In general, young children are more susceptible to misinformation than older children and adults (Ceci and Bruck 1993) and the elderly are more susceptible than younger adults (Karpel et al. 2001). However, studies indicate that induced distortion and false memory is a phenomenon that occurs with people of all ages, even if it is more pronounced with certain age groups. With respect to personality variables, several have been shown to be associated with greater susceptibility to misinformation such as empathy, absorption, and self-monitoring. The more one has self-reported lapses in memory and attention, the more susceptible one is to misinformation effects.

**Scientific Research Has Demonstrated That Imagination Influences Memories & Confidence Levels In The Occurrence Of Fictitious Events**

17. Scientific research has demonstrated that memories for both childhood events and more recent actions are influenced by imagination (Garry, Manning, Loftus & Sherman, 1996; Roediger, 1998). Typically, confidence in the occurrence of fictitious events increases after those events have been imagined – a phenomenon called *imagination inflation* (Garry et al. 1996; Goff and Roediger, 1998; Heaps and Nash, 1999; Paddock et al. 1999; Thomas and Loftus, 2002). An increase in source monitoring errors after repeated imagining has also been used to demonstrate the imagination inflation effect (Goff and Roediger, 1998).

18. Research suggests that imagination inflation can be accounted for by both the source monitoring framework (Johnson, Hashtroudi & Lindsay, 1993) and familiarity misattribution theory (Jacoby, Kelley & Dywan, 1989). According to the source monitoring framework, thoughts, images, and feelings that are experienced as memories are attributed to particular sources of past experiences (Lindsay and Johnson, 2000). The assessment of these and other qualitative characteristics, such as the amount and quality of sensory information (e.g., color and sound), contextual information (e.g., time and place), semantic detail, and cognitive operations, allows one to determine the credibility of a memory (Johnson et al., 1993; Johnson and Raye, 1981). According to the familiarity misattribution theory, prior exposure or familiarity biases recognition and affects how easily information is processed which in turn influences source judgments (Jacoby and Dallas, 1981; Jacoby, Kelly, Brown & Jasechko, 1989; Moreland and Zajonc, 1977; Jacoby, Allan, Collins and Larwill, 1988).

19. Research has determined that when witnesses are pressed to elaborate on perceptual characteristics of suggested events, an increase in the occurrence of false memories for those events is found. Participants who answered questions that encourage them to elaborate on the location and physical appearance of items were much more likely to later claim that they “definitely” remembered seeing the suggested item. (Drivdahl & Zaragoza, 2001.) Research has also demonstrated that repeatedly imagining an action increased the likelihood that participants would erroneously claim to have

performed the action (Thomas, Bulevich & Loftus, 2003). These findings demonstrate that when perceptual and sensory information is increased, false memories also increase; that people use specific perceptual information to determine whether events were experienced or only thought about.

20. Multiple studies have shown that active imagination/visualization of events, objects, or persons can lead to false memories of having actually seen, performed, or experience them. Imagination has produced false memories for simple perceptions, such as having seen or heard objects or sounds, for more complex recent personal actions, such as having said or done something, both mundane and bizarre, as well as for distant autobiographical memories for a range of events (Davis and Loftus, 2006; Johnson et al. 1993; Mazzoni and Memon, 2003; Schacter, 1996, 2001; Thomas and Loftus, 2002). Even paraphrasing event descriptions or explaining how an event might have happened can produce inflation (e.g., Sharman et al. 2004, 2005). One researcher has reasoned that when real memories are vague and lacking in vivid detail, as when memories are from the distant past or were never encoded richly in the first place, it is easier to confuse imagined and real events (Johnson et al, 1988).

## **Reconstructive Influences On Memory & Belief**

21. Understanding that suggestive influences can distort and construct beliefs and memories have led researchers to also seek understanding of reconstructive influences on memory and belief.

22. Studies concerned with retrospective bias have shown that reports of our past attitudes or behaviors are biased by current self views, goals, and beliefs. Similarly, recollection of one's own behavior can be changed to conform to newly acquired information about how one should behave. The consideration of the possibility that one has been abused may exert direct or indirect reconstructive effects, and some patients may come to adopt a highly elaborate personal identity as an abuse survivor (Kihlstrom, 1998). The self-definition as an abuse survivor has the potential to exert reconstructive influence on the autobiographical memory.

23. Researchers have identified several potential factors which may serve as a reconstructive influence on one's memory and belief. The circumstances preceding one's exposure to the notion of prior abuse may have the effect of priming the assertion of prior abuse, including repressed memories of abuse. These priming influences can range from the dramatic increase in awareness of sexual abuse in society and familiarity with concepts of "repression" through popular culture, to widespread media coverage of abuse, to elevated awareness among therapists already acquainted with concepts of trauma and repression.

24. Among the effects of priming particular “schemas” are *selective attention to relevant information, biased interpretation of relevant information, and constructive and reconstructive memory processes* that generally consist of confabulation of schema consistent (but false) memories and distortion of memories of past events toward consistency with currently activated schemas (Davis and Follette, 2001; Davis and Loftus, 2006; Kunda, 1999). One who has been exposed to accounts of repressed abuse while having abuse fully primed in his mind, may present with a pre-existing idea that he may have been abused.

25. “Premature cognitive commitment” (Pope and Brown, 1996) occurs when, rather than conducting objective hypothesis testing, an interviewer or therapist embarks upon a quest to discover abuse consistent evidence, discounting inconsistent evidence. The dangers of premature cognitive commitment are more pronounced in circumstances such as litigation where one is pursuing confirming evidence of abuse. Scientific literature has documented the dangers of confirmation bias (the tendency to affirm the diagnosis one is considering) in clinical diagnosis and judgment (e.g., Garb, 1998; Pope and Brown, 1996). Confirmation bias has been documented even under circumstances in which clinicians are asked to review an unknown patient’s file to evaluate whether the patient suffers a particular disorder without any contact with the patient, without any reason to favor the designated diagnosis, and in an effort to provide an unbiased assessment (e.g., Copeland and Snyder, 1995; Kassin and Gudjonsson, 2004; Meissner and Kassin, 2004). Confirmation bias has also been

recognized in biased interviewing procedures that typically ask questions in a manner to elicit apparently confirming information from an interviewee (e.g., Fazio et al. 1981, Snyder, 1984, Snyder & Thomsen, 1988).

26. “Motivated cognition,” also referred to as “effort after meaning,” may also have reconstructive influence on memory and belief, and occurs when one is in search for an explanation of their problems rendering one vulnerable to accepting seemingly plausible potential causes. The existence of a potential explanation may motivate one to seize on the abuse hypothesis, thereby causing a strongly biased search for and interpretation of information to defend against doubt.

27. Biased hypothesis testing strategies also may elicit apparently confirmatory evidence of abuse which in turn has a reconstructive influence on memory and belief. Schematic processing can result in selective attention to abuse relevant information, disregard for abuse relevant information, and interpretive biases toward consistency with an abuse hypothesis, including explaining away apparently inconsistent information. This includes retrospective biases of interpretation such as the “hindsight” bias, whereby the past is interpreted as consistent with current knowledge. Therapists may also fall prey to the “representativeness” heuristic (Kahneman and Tversky, 1972), assuming that if the patient’s symptoms fit those viewed as consistent with abuse, the patient must have been abused. This is, of course, fallacious, in that “if abuse, then symptom” does not logically imply “if symptom, then abuse.”

28. Suggested influences, both inside and outside of therapy, are likely to enhance the plausibility of abuse, notwithstanding the absence of memories. Such suggestive information can come from the media, therapists' suggestions, as well as other sources. These can also include memory recovery procedures, including activities geared toward remembering such as through "journaling," and interpreting physical symptoms as implicit memories (e.g., Poole et al. 1995; Brainerd and Reyna, 2005; Loftus & Ketcham, 1994; McNally 2003). Activities involving the effort to remember which involve creating images of past events are viewed by researchers as dangerous in that the creation of vivid and elaborate images may later become confused with memories (see discussion regarding *imagination inflation* above). As images appear through various activities geared towards understanding and remembering, a person may misunderstand the source of these images and narratives (an error of source monitoring), misattributing them to be true memories of abusive events.

**It Is Not Yet Possible To Reliably Distinguish Between True & False Memories Without Independent Corroboration**

29. Many of the false memory studies have explored whether true and false memories differ. Most studies have found that there are statistical differences, such as subjects using fewer words when describing false memories and subjects rating the clarity of their false memories as lower than true memories. However, true memories that were not recalled at first and were then recalled up to 3 weeks later were similar to false memories in terms of emotional

strength, image, clarity and the confidence with which the subjects held such memories. Studies have also found that perceived events often incorporate more perceptual and sensory detail, whereas imagined events are associated more strongly with cognitive operations. Research into the differences between perceived events and imagined events has also revealed that people remember what they felt and thought about perceived events better than they did about imagined ones. Rated clarity of memories, thoughts and feelings decreased faster for imagined than for perceived events.

30. What science has established at this time is that true memories, like false ones, are constructed, and that a reliable means for discerning true memories from false memories is virtually impossible without the benefit of independent corroboration.

### **Reliability Of Memories "Recovered" From Decades Past**

31. I have been asked to convey my opinion of whether scientific evidence supports the reliability of mental cognition believed by a subject to be a "recovered memory" of a traumatic event that was "suppressed" through "dissociation" or "amnesia" decades earlier.

32. While I have not been asked to address in this affidavit the subject of whether "repressed memory," also known by several other names such as "repression," "dissociative amnesia" and "traumatic amnesia," has been established as a valid phenomenon by scientific study, the scientific status of "repressed memory" cannot help but to inform my opinion.

33. As a scientist who has studied human memory for more than three decades, I state here without equivocation that “repressed memory” – unlike many other psychological phenomena involving human memory – has not been established by science as a valid and existing phenomenon. The existence of “repressed memory” remains the subject of enormous debate and disagreement. In fact there is so much controversy over the topic, and given the lack of credible scientific support, it cannot be said that the concept is generally accepted within the scientific community.

34. The absence of scientific evidence establishing the existence of “repressed memory” is one factor which would itself render an asserted “recovered memory” of past trauma unreliable.

35. As set forth above, scientific study has established that human memory is highly malleable. While it is not possible to distinguish between true and false memories, scientific study has established over several decades that suggestive influences can both distort existing memory and create entirely false memories and beliefs. Consequently, separate and distinct from the fact that the existence of “repressed memory” is not supported by valid and reliable scientific testing, circumstances surrounding recall of a “memory” and the presence of suggestive influences can be assessed independently to determine whether the reliability of a purported memory is undermined by suggestive factors.

36. The presence of certain factors would serve to increase the likelihood that the “memory” was a false belief that could not reasonably be

relied upon in a court of law or otherwise. For example, a lengthy interval of time, such as 15-20 years, from the purported traumatic event to the purported “recovery” would substantially increase the inability to detect discrepancies between an actual event and the purported memory. Self-reported lapses in memory and attention relative to the time period being “remembered” would likewise substantially increase the potential for misinformation and suggestion to influence and distort recollection. The verifiable presence of suggestive influences such as widespread media attention or accounts of abuse by similarly situated third parties would serve to further undermine reliability. The circumstances surrounding the assertion of memory would also be highly relevant, such as whether the memory formed the basis of litigation and for the recovery of compensation. Evidence of premature cognitive commitment on the part of the subject or those surrounding the subject; circumstances indicating confirmatory bias of interviewers, therapists or attorneys; indication that the subject engaged in repetitive recall through techniques such as journaling, in therapy, or through procedures that involve repeated requests for elaboration -- any of these would raise significant further issues regarding whether the “memory” represented an actual event, and would be essential considerations for any person or entity tasked with making a judgment about whether a memory was true or false, or met a threshold of reliability. A pattern evidencing a subject’s initial uncertainty as to the truth of the memory, followed by suggestive influences and then growing confidence would tend to corroborate

the unreliability of the purported memory. The absence of compelling corroborating evidence would further undermine reliance on the “memory” as representing an actual event.

37. In summary, the existence of the phenomenon commonly known as “repressed memory” has not been validated by scientific study and has not been generally accepted in the scientific community. In light of the current scientific evidence, it is my opinion that a “memory” of some trauma assertedly recovered from decades earlier cannot be relied upon as a representation of an actual event. Furthermore, scientific research has established that human memory is malleable and vulnerable to suggestive influences that can both distort memory and create completely false memories and beliefs. Therefore, separate and apart from the fact that the existence of “repressed memory” is not supported by valid and reliable scientific testing, circumstances surrounding recall of a “memory” and the presence of suggestive influences can also be assessed independently to determine whether the reliability of a purported memory is undermined by suggestive factors. The presence of suggestive factors referenced in paragraph 35 would serve to undermine the reliability of a purported memory. Consideration of these factors with a thorough understanding of memory suggestibility would be essential for any person or entity responsible for making a determination as to whether mental cognition believed by a subject to represent an actual memory or a real event was reliable.

The foregoing is true to the best of my knowledge and belief. Signed  
under the penalties of perjury this \_\_\_\_ day of \_\_\_\_\_, 2007.

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Elizabeth Loftus, Ph.D