Manufacturing False Memories
Using Bits of Reality

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The controversy over the recovery of repressed memories provides a contemporary place where the concepts of metacognition and implicit memory both come into play. The idea that adult problems stem from the harboring of deeply repressed memories gained widespread attention when it became the cornerstone of Freud’s (1916–1917) theory of mental functioning. Freud used a rather charming spatial metaphor to convey his view of repression and of the relationship between the unconscious, which he compared to a large hall, and consciousness, which was more like a smaller reception room:

On the threshold between the two there stands a ... door-keeper, who examines the various mental excitations, censors them, and denies them admittance to the reception room when he disapproves of them. ... When (the mental excitations) have pressed forward to the threshold and been turned back by the door-keeper ... we call them then repressed. ... The door-keeper is what we have learnt to know as resistance in our attempts in analytic treatment to loosen the repressions. (pp. 306–307)

Freud was clear in his views of the goals of psychoanalysis; namely, to undo repression and get the patient to remember the forgotten traumatic events of childhood. Freud appeared to accept without questioning the therapeutic benefits of digging for hidden treasures in the depths of his patient’s mind (Arlow, 1995).
The repression theory, as it is used today, goes beyond Freud's imagination. Well articulated by Steele (1994), it is the theory:

That we forget events because they are too horrible to contemplate; that we cannot remember these forgotten events by any normal process of casting our minds back but can reliably retrieve them by special techniques; that these forgotten events banished from consciousness, strive to enter it in disguised forms; that forgotten events have the power to cause apparently unrelated problems in our lives, which can be cured by excavating and reliving the forgotten events. (p. 41)

In terms of metacognition, the repression theory expresses a number of widely held beliefs about the way human memory allegedly works. These include the belief that some events are so horrible to contemplate that they are automatically banished into the unconscious, and even an endless stream of traumas can be banished in this way. Briere (1989) has been explicit about the claim that these memories are removed from awareness:

Repression . . . refers to an unconscious dissociation or splitting off of memories from awareness, in order to avoid the painful affects which would otherwise accompany such recollections. . . . As it applies to sexual abuse trauma . . . repression refers to some survivors' ability to banish from memory the most painful aspects of early childhood victimization. (p. 49)

Terr (1994) has claimed that multiple traumas are the most likely candidates for such banishment: “Multiple traumas and particularly long-standing childhood traumas are the types of memory most likely to be repressed” (p. 4).

The repression theory also includes the belief that the excavation of these recalcitrant memories can be done in some reliable way, and that such excavation leads to a cure of the patient. Kritsberg (1993), for example, emphasized his view that “complete repression” exists, but body, emotions, and cognitive mind “remember” and moreover that “release of repressed memories is crucial to healing” (p. 85).

The repression theory also expresses a number of beliefs akin to some notions of implicit memory. In this theory the banished events are not available to consciousness, yet express themselves in the form of symptoms and problems such as low self-esteem or body memories (Van der Kolk, 1994). These theoretical ideas might be harmless except for the fact that many psychotherapists engage in practices and assume they are true, practices which may be risky if not dangerous (Poole, Lindsay, Memon, & Bull, 1995).

Even psychotherapists who adhere to the theory of repression have acknowledged the mistakes made by some of their colleagues. In her book
Trauma and Recovery, Herman (1992) made this point: Whereas an earlier generation of therapists might have been discounting or minimizing their patients’ traumatic experiences, the recent rediscovery of psychological trauma has led to errors of the opposite kind. Some contemporary therapists have been known to tell patients, merely on the basis of a suggestive history or “symptom profile,” that they definitely had a traumatic experience. Even if there is no memory, but merely some vague symptoms, certain therapists will inform a patient after a single session that they were very likely the victim of a Satanic cult. Once “diagnosed,” the therapist urges the patient to pursue the recalcitrant memories. Although some therapists recommend against persistent, intrusive probing to uncover early traumatic memories, others unfortunately engage in these therapeutic strategies.

In addition to intrusive probing, the worrisome activities include attempts at excavating the “repressed” memories through age regression, guided visualization, trance writing, dream work, body work, hypnosis, and sodium amytal. What dangers are inherent in these activities that arise from an abiding faith in the constellation of beliefs about memory that underlie the repression theory? Numerous commentators have worried that risky or dangerous therapeutic interventions are leading patients to construct false memories about their past (Lindsay & Read, 1994; Loftus, 1993; Ofshe & Watters, 1994; Pendergrast, 1995; Poole et al., 1995).

The hypothesis that false memories could be manufactured by suggestive therapy in particular, or suggestion in general, invites an inquiry into what is generally known about false memories. Since the mid-1970s at least, investigations have been done into the creation of false memories through exposure to misinformation. Now, nearly two decades later, we have hundreds of studies to support a high degree of memory distortion. People have recalled nonexistent broken glass and tape recorders, a clean-shaven man as having a mustache, straight hair as curly, and even something as large and conspicuous as a barn in a bucolic scene that contained no buildings at all (Belli, 1989; Chandler, 1991; Loftus, 1979; Loftus & Ketcham, 1991). This growing body of research shows that new, postevent information often becomes incorporated into memory, supplementing and altering a person’s recollection. The new information invades us, like a Trojan horse, precisely because we do not detect its influence. Understanding how we can become tricked by revised data about our past is central to understanding the hypothesis that suggestions in popular writings or therapy sessions can affect our autobiographical recall.

One frequently heard comment about the research on memory distortion is that the changes induced by misinformation are about trivial details (Darton, 1991). There is no evidence, the argument goes, that you can tinker with memories of real traumatic events or that you can inject whole events into the human mind for things that never happened. Although a
century of anecdotes—both literary and real—reflect the not-uncommon human experience of entirely false memories, now these anecdotes have been bolstered by recent experimental evidence.

On the literary front, the subject of false memories brings to mind a piece of literature from Mark Twain (1916). In his short story “The Man That Corrupted Hadleyburg,” a character named Mr. Richards stands to be rewarded a large sum of money if he can manage to remember a good deed that he may or may not have done for a man named Mr. Goodson. Richards desperately needs the money, but he cannot recall ever having talked to Goodson, and cannot bring himself to lie. Further, lying would be useless, as Goodson’s spokesman had not informed anyone of what the good deed actually was. The first person to come forward with the good deed information earns the money. Richards mulls this over and develops an abiding faith that he, being the righteous soul that he is, must have been the one to have done the good deed—if only he could remember it.

Richards resolves to remember at any cost, and, after concentrating for several hours, refusing to sleep until the recalcitrant memory appears, a memory does appear. Richards remembers rescuing Goodson’s reputation with some timely information that saves him from marrying an allegedly tainted woman. Twain eloquently described Richards’ thoughts: “It was all clear and simple now, and the more he went over it, the more luminous and certain it grew, and at last, when he nestled to sleep satisfied and happy, he remembered the whole thing, just as if it had been yesterday” (p. 108).

Although Twain’s story is fictional, it is a valuable springboard for asking questions that are central to this chapter. Is Richards’ memory authentic? Was he induced to develop a memory by the promise that a certain Good Samaritan would be rewarded? What role if any was played by the potential that a memory would hold as a solution to his poverty? If the memory is false, what is the mechanism by which it was created? Can such false memories be distinguished from those that are authentic?

Whole memories can be implanted into a person’s real-life autobiography, as is best shown by foremost developmental psychologist Jean Piaget’s (1972) classic childhood memory of an attempted kidnapping. The false memories were with him for at least a decade:

One of my first memories would date, if it were true, from my second year. I can still see, most clearly, the following scene, in which I believed until I was about fifteen. I was sitting in my pram, which my nurse was pushing in the Champs Elysees, when a man tried to kidnap me. I was held in by the strap fastened round me while my nurse bravely tried to stand between me and the thief. She received various scratches, and I can still see vaguely those on her face... When I was about fifteen, my parent received a letter from my former nurse... she wanted to confess her past faults, and in particular
to return the watch she had been given as a reward... She had made up the whole story... I, therefore, must have heard, as a child, the account of this story, which my parents believed, and projected into the past in the form of a visual memory. (p. 48)

Although widely disseminated and impressive at first glance, Piaget's false memory is still but a single anecdote and subject to other interpretations. Was this really a memory, or an interesting story? Could it be that the assault actually happened and the nurse, for some inexplicable reason, lied later? Given these alternative interpretations for Piaget's report, it would be nice to find stronger evidence that a false memory for a complete event was genuinely implanted.

FALSE CASES OF FALSE MEMORY FOR BEING LOST

Could we experimentally implant memories for nonexistent events of a mildly traumatic nature? Could it be done in a way that balances the need to protect subjects and the scientific interest in examining the process of memory development? We have now developed a paradigm for instilling a specific childhood memory for being lost at the age of 5. We chose "getting lost" because it is clearly a great fear of both parents and children.

Could subjects be made to believe that they were lost on a particular occasion when they were about 5 years of age? Consider the following five cases, presented in some detail here to show what examples led to the design of a formal study (see Loftus & Ketcham, 1994, for details on the development of these ideas).

Jenny (Age 8)

Jenny was convinced by her father that she had been lost when she was 5. Jenny's father pulled Jenny aside during a birthday party. He began the memory injection with a simple question: "Hey, Jenny, do you remember the time that you got lost at the Bellevue Mall?" At first, Jenny resisted the suggestion, and a funny expression came across her face. Her father pressed on with more details: "You were about 5 years old." Jenny still resisted: "How do you expect me to remember that far back?" But the father provided more details: "Don't you remember that I told you that we would meet at the Tug Boat (a landmark inside the Bellevue Mall). And you got lost and I couldn't find you." He embellished the experience with known facts about the mall and whenever he sensed resistance, he reminded her that "was a real scary time." Soon Jenny began to "remember," and to provide some novel details. She even remembered how she felt at the time.
When her father recalled “I was so scared,” she replied, “Not as scared as I was.”

Brittany (Age 8)

Eight-year-old Brittany was convinced by her mother that she too had been lost when she was about 5. Her mother reminded her that she and her best friend had gotten lost in a condominium complex, Selby Ranch, where the best friend lived. This is the “story” Brittany was told by her mother as if it were the truth: “A kind old lady who lived in the complex found Brittany and took her into her condo and gave her a cookie. The lady had a beautiful daughter who was a model in San Francisco and the daughter gave Brittany a bouquet of balloons.”

Eighteen days later, a friend of the family interviewed Brittany under the pretense of getting information for a school newspaper article on childhood memories. The friend asked about some genuine memories, and then asked about the implanted one. Brittany failed to remember anything about one of the actual events, her sixth birthday party at Aunt Sue’s farm. She was pressed:

Q: Don’t you remember it?
A: I don’t. It was in our house at Houston.

Q: Don’t you remember what you did?
A: No.

Q: Do you remember who was there?
A: No . . . well, I know Samantha was there. No she wasn’t. She wasn’t born yet.

When the interviewer asked Brittany about the false memory, she had quite a bit to say:

Q: Do you remember where you were?
A: Selby Ranch . . . I can’t remember like how it looked. But I think it was there. There was like hay. It was around Halloween, so there were pumpkins around.

Q: Who was with you?
A: Um . . . Christina, Camille . . . and, me and my mum were visiting my grandparents.

Q: What were you doing?
A: Well, we were playing, and, but then Christina left. I think she had to make a phone call or something. And then me and Camille went off playing in the woods. And . . . um . . . I really can’t remember
this, but I think this happened when we went to this girl’s house. Her daughter was a model. And then we made cookies at her house. And then my mum finally found us. But everyone like my grandparents called my mum but Christina called them.

Brittany embellished further: The lady whose house they went to not only gave them one cookie but baked a batch of cookies with them. Her home became a “small cottage outside the gates of Selby Ranch.” (Note: the houses in the area are predominantly 4000 sq. ft contemporary California style ranches.) When Brittany’s mother found her, she allegedly said, “Thank goodness I found you, I was looking all over for you.”

Chris (Age 14)

Chris was convinced by his older brother that he had been lost in a shopping mall when he was 5 years old. In the first phase, Chris was asked to write about some of his childhood memories. Three of the events actually happened, and the fourth did not. A short paragraph introduced the event to be remembered, and Chris wrote about the events each day for 5 days. He was instructed to write “I don’t remember” if he could not recall an event on any particular day.

Chris’s brother introduced the false memory thus:

It was 1981 or 1982. I remember that Chris was 5. We had gone shopping at the University City shopping mall in Spokane. After some panic, we found Chris being led down the mall by a tall, oldish man (I think he was wearing a flannel shirt). Chris was crying and holding the man’s hand. The man explained that he had found Chris walking around crying his eyes out just a few moments before and was trying to help him find his parents.

Here is precisely what Chris wrote each day:

Day 1: “I remember a little bit about that man. I remember thinking, ‘Wow! he’s really cool!’ ”
Day 2: “That day I was so scared that I would never see my family again. I knew that I was in trouble.” (sic)
Day 3: “I remember mom telling me never to do that again.”
Day 4: “I also remember that old man’s flannel shirt.”
Day 5: “I sort of remember the stores.”

In summarizing his memory, Chris produced not exactly a summary, but a new fact. He remembered a conversation with the man who found him: “I remember the man asking me if I was lost.”
It would be natural to wonder whether perhaps Chris was simply trying to please or help his brother and was producing “memories” for extraneous motivations. Evidence against this possibility comes from Chris’s responses to one of the true memories. Recall that Chris was told to write “I can’t remember” if he could not recall a particular event. For one of the true memories, he did precisely this.

Here, he describes that true memory:

It was sometime in 1981 or 1982. Dad was gone and winter was coming. We had very little money and no oil. When I tried to chop all that wood that we had delivered, I did a very bad job of it (I was only 12). Dick O’Brien, the old man next door, saw what I was doing and came over to help. He wound up chopping almost all the wood, even though it must have been very hard for him. I think he wore a black coat and a cap.

Here are his daily responses—verbatim:

Day 1: “I can’t remember.”
Day 2: “I still can’t remember.”
Day 3: “I still can’t remember.”
Day 4: “I still can’t remember.”
Day 5: “I still can’t remember.”

When asked to summarize, he simply said: “I’m sorry I can’t remember this incident.”

It would be natural to wonder whether perhaps Chris had really gotten lost that day. Maybe it happened, but his brother forgot. To shed further light on this possibility, we obtained data from Chris’s mother, who was allegedly a participant that day in the mall. Chris’s mother confirmed no memory for the created event. She tried hard to remember, but simply could not, as her first 2 days of attempted recollection reveal:

Day 1: “I have thought about this day, but I am having trouble remembering the details.” (sic)
Day 2: “I have tried and tried to remember this day. I see us looking under clothes racks for Christopher’s feet, but I can’t honestly say that this was that time.”

After five days of trying, she summarized: “For some reason I feel guilty about this, that I can’t remember.”

A couple of weeks later, Chris was reinterviewed. He was first asked to describe each of the four events, and to rate each one according to how clear it was, on a scale from 1 (not clear at all) to 11 (very very clear). For
the three true memories, Chris gave ratings of 1, 10, and 5. For the false shopping mall memory, he gave a rating of 8. Thus his false memory was amongst the clearest.

When he described the false getting-lost memory, he greatly expanded on it:

I was with you guys for a second and I think I went over the look at the toy store, the Kay-Bee toy and uh, we got lost and I was looking around and I thought, "Uh-oh. I'm in trouble now." You know. And then I . . . I thought I was never going to see my family again. I was really scared, you know. And then this old man, I think he was wearing a blue flannel, came up to me. . . . He was kind of old. He was kind of bald on top. . . . He had like a ring of gray hair . . . and he had glasses.

Thus, in two short weeks, Chris now could even remember the balding head and the glasses worn by the man who rescued him. He characterized his memory and reasonably clear and vivid.

Then, Chris was debriefed. When told that his "getting lost" memory was made up, he clung to it: "Really? I thought I remembered being lost . . . and looking around for you guys. I do remember that. And then crying, and mom coming up and saying, 'Where were you. Don't you. . . . Don't you ever do that again.'"

Chris's debriefing was designed with an appreciation of the sensitivity of the situation. He was told that misremembering things is very common in life, and that his behavior was perfectly normal. His was given a chance to express his feelings and reactions to the study. He was made to feel that the experience was a valuable one for him to participate in. He was interviewed on numerous subsequent occasions to assess long-term reactions to the experience. On one occasion he visited the University, met with the research team, and joined in a discussion of the meaning of the experience for him.

Chris was 14 years old when he constructed the false getting-lost memory. Could the same thing be done with people who were now adults?

**John (Age 22)**

John, a 22-year-old man, was convinced by his aunt that he had been lost at a large sporting goods store (REI) at the age of 5 or 6. This is the story John was told by his aunt as if it were the truth:

Fairly soon after we moved to our house in Madronna (so you must have been 5 or 6), Dan and I took you and Lisa with us to REI. Somehow we lost you. We had just started searching for you when we spotted you being led along by an older man. He was very nice and explained that he had
found you at the foot of that long included ramp, crying and looking around. It apparently took us a while to notice that we had lost you.

A day after the attempted memory injection, John had no memory: “After first reading this, I have no memory of the event at all. I don’t even remember ever talking about it. I of course have other memories of being in REL.” Two days afterward, however, his memory was starting to develop: “I have a vague memory of being at the top of the ramp, crying. I don’t remember what happened next. This came to me suddenly as I was trying to remember the event.”

Bill (Age 42)

Bill, a 42-year-old man, was convinced by his sister that he had been lost. To instill the memory, she gave him this description:

I remember when you were about 5 or 6 and you got lost at Sears. Mother had taken us there to get some shoes. I guess while I was trying some on, you wandered off. After mother realized you were gone, she told me to stay where I was and I had just started to look for you when we saw you being led along by an elderly man. You were crying and holding his hand. He explained that he had found you by the candy counter looking confused and crying a little.

A day after getting the description from his sister, Bill tried to remember the specific location: “I think I remember (or can imagine?) getting lost—I remember what Sears looked like in Santa Monica—or was it at J.C. Penney’s? I felt panicky—where were Mom and Linda; I felt scared.” The next day, Bill remembered more: “I remember going up or down the stairway at Sears. I remember the elevator bell at Sears. Now I remember—it was Sears and not J.C. Penney’s.”

These five individuals, ages 8 to 42, were, with little difficulty, led to develop a false memory, or at least a partial one, for something that never happened. The memories pertained to a specific episode of being lost. Are their memories real to them? If the willingness to expand on the memory and to provide details that were not initially suggested is any indication, then the answer is yes. Jenny remembered being scared. Brittany embellished the memory with pumpkins and batches of cookies. Chris embellished his memory with conversations and flannel shirts. Bill added elevator bells.

These examples are still only anecdotes, but they take us somewhat beyond the Piagetian anecdote that has survived in the psychological literature for over 30 years. The examples tell us that implantation of an entire childhood memory is not a particularly difficult thing to do, and
reveal a means by which it can be done. Of course, many questions remain. How often can false memories of this type be implanted in people? Who is particularly susceptible to memory implantation and conversely who is resistant? Under what conditions might people be resistant to such memory implantation, and are there ways to protect people from these mental invasions? Some of these questions have been explored in subsequent research utilizing a procedure that grew out of these initial observations.

CREATING MEMORIES OF BEING LOST

Loftus and Pickrell (1995) reported the results of a study involving 24 individuals who were asked to recall events that were supplied by a close relative. As with the case example, Chris, three of the events were true, and one was a research-crafted false event about getting lost in a shopping mall, department store, or other public place. The subjects, who ranged in age from 18 to 53, thought they were taking part in a study of childhood memories. In phase 1, they completed a booklet containing four short stories about events from their childhood provided by a parent, sibling, or other older relative. Three events actually happened, and the fourth, always in the third position, was false. The events were described in a single paragraph.

The false event was constructed from information provided by the relative who gave us details about a plausible shopping trip. The relative was asked to provide the following kinds of information: (a) where the family would have shopped when the subject was about 5 years old; (b) which members of the family usually went along on shopping trips; (c) what kinds of stores might have attracted the subject’s interest; and (d) verification that the subject had not been lost in a mall around the age of 5. The false event was then crafted from this information. The false events always included the following elements about the subject: (a) lost for an extended period of time, (b) crying, (c) lost in a mall or large department store at about the age of 5, (d) found and aided by an elderly woman, (e) reunited with the family.

Here is a paragraph created for a 20-year-old Vietnamese American woman who grew up in the State of Washington:

You, your mom, Tien and Tuan, all went to the Bremerton K-Mart. You must have been 5 years old at the time. Your mom gave each of you some money to get a blueberry ICEE. You ran ahead to get into the line first, and somehow lost your way in the store. Tien found you crying to an elderly Chinese woman. You three then went together to get an ICEE.
Subjects completed the booklets by reading what their relative had told us about each event, and then writing what they remembered about each event. If they did not remember the event, they were told to write, “I do not remember this.”

When the booklets were returned, subjects were called and scheduled for two interviews. These occurred approximately 1 to 2 weeks apart. We told the subjects we were interested in examining how much detail they could remember, and how their memories compared with those of their relative. The event paragraphs were not read to them verbatim, but rather bits of them were provided as retrieval cues. When the subject had recalled as much as possible, they were asked to rate the clarity of their memory for the event on a scale of 1 to 10, with 1 being not clear at all and 10 being extremely clear. Next, subjects rated their confidence on a scale of 1 to 5 that given more time to think about the event they would be able to remember more details (1 = not confident and 5 = extremely confident that they would be able to remember more).

In all, 72 true events were presented to subjects, and they remembered something about 49 (or 68%) of these. This figure did not change from the initial report through the two follow-up interviews. That nearly 70% of the true events were consistently remembered can be seen in Fig. 8.1.

The rate of “remembering” the false event was lower. Seven of 24 subjects “remembered” the false event—either fully or partially—in the initial booklet, but in the follow-up interviews only 6 subjects (25%) remembered the event. These data also appear in Fig. 8.1.

![Percentage Remembered](image)

**FIG. 8.1.** Data from Loftus and Pickrell (1995): Percentage of true and false events that were remembered. Adapted with permission.
There were some differences between the true memories and the false ones. For example, subjects used more words when describing their true memories, whether these memories were fully or only partially recalled. Also, the clarity ratings for the false memories tended to be lower than for true memories produced by those same subjects. Interestingly, there was a tendency for the clarity ratings of the false memories to rise from the first interview to the second. Subjects also rated how confident they were that they would be able to recall additional details at a later time. In general, the confidence ratings were low, but lower for the false event than the true ones.

Our results show that people can be led to believe that entire events happened to them after explicit suggestions to that effect. We make no claims about the percentage of people who might be able to be misled in this way, only that these cases provide an existence proof for the phenomenon of false memory formation. To show how richly detailed these false memories can be, and how fervently subjects can cling to them, we present a detailed case that emerged in an unusual way.

The Case of Becca

Becca's case arose after the McNeil/Lehrer News Hour approached us about filming the creation of a false memory. To their disappointment, our main experiment had been completed and no subjects were currently being run. We agreed, however, to conduct a demonstration of the study with two individuals, both women supplied by the news program. These women gave their informed consent, but additionally agreed that their materials could be used in a demonstration for a television news story. Due either to the good luck of McNeil/Lehrer or the superbly persuasive skills of the implanting research associate, both women adopted a false memory of being lost. We describe in detail the evolving recollections of one of those women—a 20-year-old college student who was an occasional baby-sitter for the producer of the program.

Becca was told that her mother had provided several events that occurred when Becca was between the ages of 4 and 6. She tried to recall these events three times, with the interviews separated by 10 or 11 days.

The True Events. One of the true events involved taking a trip from California to Washington in a Volkswagen at Christmas time. Becca was never able to clearly recall this event. Her clarity rating went from "1, maybe even half" to a "3," although she maintained that she did not remember much. Another true event involved a summer car trip, sitting on her mother's lap, commenting on the moon. Becca remembered this event, although there were changes in her recollection across the inter-
views. Her clarity rating went from "6" to "5." Another involved a birthday party attended by Becca and her mother in Old Mill Park. Becca remembered this event, and added new information (her cousins were probably there). Those who were "probably" there in the first interview were recalled as having clearly been there by the third interview. Both clarity ratings were "5."

The False "Lost-in-the-Mall" Event. This experience was supposed to have occurred at the Tacoma Mall where Becca had gone with both her mother and father. She was supposedly last seen playing on the escalators, not far from a pet store. Becca began trying to remember by first placing herself in the situation, repeating "I was lost," and stating that she had "a vague memory of being lost." Becca provided details of what she "probably" would have done and felt. Most interesting were changes in her recollection of the pet store, the older woman, whether she was crying, and the messages that blared over the PA system during this alleged encounter.

During Becca's first attempt to recall getting lost at the Tacoma Mall, she remembers the pet store: "I do remember like there was one mall that did like have a pet store and stuff and I used to like always want to go in there. I would always be wanting to look at the dogs or whatever." Although she does not appear to remember being involved with the pet store on the day she was supposedly lost in the mall, by the second recall attempt Becca brings up the pet store on her own in response to a question about what stores she might have passed when she was lost: "Well, it must have been something ... that I was obviously interested in... So you had previously mentioned there was a pet store there, so I was probably playing with puppies or something." By the third recall attempt, Becca seems to be remembering: "I remember being somewhere and looking at the dogs." Toward the end of this last recollection, Becca is asked if there is anything else she can remember about the event: "No. Just the basic interior of the mall. And like what the puppy store looked like and stuff like that."

The PA system enters into Becca's recollection during her first attempt at recall when she is considering what her parents might have done in this situation: "Well, they probably would have gone back to where they originally thought that I would have gone and then more than likely they probably would have gone to like the security or whatever and had me paged." In response to a probe—"Do you ever remember hearing your name on the PA system?"—Becca does, saying: "Yeah, I do remember that." This "could have been" the time when she was lost. By the second recollection, Becca volunteers a memory of the PA system: "I kind of remember my name going over the PA system." And by the third recollection, there is a major change in the PA system element of her memory: "And then the next memory I have after that is um going to the security station and
then hearing them call my mother and father’s name over the loudspeaker.” Thus, Becca reversed this aspect of her memory. Initially Becca leaned toward remembering her own name over the PA system, by the final interview she recalls hearing her parents’ names over the loudspeaker.

Becca’s recollection of the older woman also changed across interviews. Initially, Becca does not remember any older woman. By the end of the first interview, she accepts the possibility that the elderly woman could have come up to her: “Yeah, she could have come up to me or um actually I think more than likely I probably would have tried to look for them myself first. And then gone up to someone maybe after that.” At this point, the older woman appears to be more of a possibility than a memory. During the second interview, Becca still does not really remember the older woman: “I don’t really remember um the old lady.” And later still, “I don’t remember the old woman. . . . Ah, although, I guess I kind of remember somebody asking my name.” Although she remains consistent that she does not remember the older woman, she leaves the possibility open with the memory of someone asking her name. However, by the third interview Becca’s recollections now include a woman: “And then someone asking me if I was lost. And I’m not sure if that was the perfume woman or just some nice woman who um just happened, you know to look at me or whatever.” And later in that same interview, when pressed for details about the woman who came up to her, she replies: “I don’t, I, I almost remember her like wearing a long skirt or sweater but, um, I’m not quite sure of that . . . I’m sure that there was a dress or something. But I don’t specifically remember what she looked like.” And when pressed further: “I don’t remember her taking my hand, but I do remember her um, asking me if I was lost, and um and then asking my name and then saying something about taking me to security.” So, it appears that Becca, who was unable to remember specifically an older woman in the first two interviews, now is able to recall details about what the woman was wearing and some conversation with her.

As for memories of crying, Becca described her feelings initially: “I’m sure that I was like very frightened and stuff. Um, but I can’t see myself like screaming or crying or anything like that.” When the interviewer expressed some doubt in the question: “Not—not crying at all?” Becca reconsidered her recollection: “I don’t—well, let me think. No, I can’t see myself like crying until like after I found them and then being like really freaked out and then like crying and stuff.” Later in the interview there is more discussion of being upset, but the language reveals an expression of what would have happened as opposed to what did happen:

Oh yeah, I would have been panicked. I would have been really freaked out, but . . . like I said I don’t think that I um just like my personality—just remembering as I was as a child. I don’t see myself like um as I said freaking out and crying and screaming or anything like that.
All events, both true ones and the false one, were first cued with an event title (family vacation, overnight hospitalization) and an age. If subjects could not recall the event they received brief additional cues, such as location or other people involved. After the first interview subjects were encouraged to continue thinking about the events, but not to discuss them, and to return for a second interview 1 to 7 days after the first.

To facilitate comparisons across the various studies, Hyman's data are plotted in Fig. 8.2, using a graph structure common for most of the figures in this chapter. In all, 74 true events were presented to subjects, and they remembered something about 62 (84%) of these in the first interview and 65 (88%) in the second interview. As for the creation of false memories, no subject recalled the false event during the first interview, but 4 of 20 subjects (20%) did by the time of the second interview. One subject "remembered" that the doctor was a male, but the nurse was female—and also a friend from church.

In a second study, Hyman et al. (1995) tried to implant three new false events that were rather unusual, such as attending a wedding reception and accidentally spilling a punch bowl on the parents of the bride or having to evacuate a grocery store when the overhead sprinkler systems erroneously activated. In this study, the experimental demands were intensified somewhat by, for example, pressures for more complete recall.

The results of this study are shown in Fig. 8.3. In all 205 true events were presented to subjects, and they remembered something about 182 (or 89%) of these in the first interview. Somewhat higher percentages were

FIG. 8.2. Data from Hyman et al. (in press) Experiment 1. Adapted with permission.
remembered during the second (93%) and third (95%) interviews. As for the false events, again no subject recalled these during the first interview, but 13 (or 25%) did so by the third interview. For example, one subject had no recall of the wedding "accident," stating, "I have no clue. I have never heard that one before." By the second interview, the subject said, "It was an outdoor wedding and I think we were running around and knocked something over like the punch bowl or something and um made a big mess and of course got yelled at for it."

In a third study (Hyman & Billings, 1996), the punchbowl false event was used again, in a study designed to explore individual differences in susceptibility to the creation of false memories. Subjects were given two to five true events that had been supplied by their parent, and the false event, which was again in the third position. They tried to recall these events on two occasions separated by a day. The main results are shown in Fig. 8.4.

In all, 218 true events were presented to subjects and they remembered something about 74% in the first interview and 85% in the second interview. False memories—either full or partial—were expressed by less than 1% of the subjects during the first interview, but by 27% during the second interview. During the second interview, one subject remembered extensive details about the unfortunate man who had punch spilled on him:

A heavy-set man, not like fat but like tall and big [with] kind [of a] big beer belly, and I picture him having a dark suit on, like grayish dark and like
having grayish dark hair and balding on top, and uh I picture him with a wide square face and I just picture him getting up and being kind of irritated or mad.

There were two individual differences measures that correlated strongly with the creation of false memories. The first is the Dissociative Experiences Scale (DES). The DES measures the tendency to have dissociative experiences or normal integration of awareness, thought, and memory. Also correlated was the Creative Imagination Scale (CIS), which is a measure of hypnotizability, and also can be construed as a self-report measure of the vividness of mental imagery.

A variation of this procedure has also been used with children whose ages ranged from 3 to 6 (Ceci, Huffman, Smith, & Loftus, 1994). They were interviewed individually about real (parent-supplied) and fictitious (experimenter-contrived) events, and had to say whether each event happened to them or not. One “false” event concerned getting one’s hand caught in a mousetrap and having to go to the hospital to get it removed; another concerned going on a hot air balloon ride with their classmates. The children were interviewed many times. Some of the results, replotted in a format to demonstrate similarities and differences with prior studies, are shown in Figs. 8.5 and 8.6. The data for the younger children, shown in Fig. 8.5, reveal that the children remembered the true events approximately 90% of the time and this figure remained relatively flat between the first and seventh session. As for the false memories, the young children
FIG. 8.5. Data from Ceci, Huffman, et al. (1994)—3–4-year-old children. Adapted with permission.

FIG. 8.6. Data from Ceci, Huffman, et al. (1994)—5–6-year-old children. Adapted with permission.
assented to them 44% of the time during the first session, and 36% of the time during the seventh session. The pattern for the older children was similar in many ways, as seen in Fig. 8.6. The true events were remembered at a higher rate (approximately 95% of the time), remaining flat across sessions. The false event was remembered at a somewhat lower rate (25% in the first session, 32% in the seventh session), also remaining relatively flat across sessions.

Although repeated interviews did not significantly increase the false beliefs, in a similar study involving more interviews about different fictitious items (i.e., falling off a tricycle and getting stitches in the leg), the rate at which children bought into the false memory was greater with more interviews (Ceci, Loftus, Leichtman, & Bruck, 1994). In this study, children aged 3-6 were interviewed about experiences in their past after being told that their mothers had reported the events had actually occurred. Over the course of up to 12 sessions, these children were instructed to make a picture of the event in their head and to think about it for a minute. Over time, children increasingly assented to the fictional events, as can be seen in Fig. 8.7. False assent rates are shown separately for the negative event (falling off a tricycle) and a positive event (going on a hot air balloon ride), and separately for the younger and older children. Notice that the younger children assented more than the older ones, and the false assent rate was higher for the positive than negative event. Also, children increased their

![False Assent Rate Graph](image)

**FIG. 8.7.** Data from Ceci, Loftus, et al. (1994)—Increasing false assent rates for positive and negative events in younger and older children. Adapted with permission.
false assent rates between the first and penultimate session. (The last session data were omitted due to procedural differences occurring during this session, but the same conclusion would be reached using data from this session.)

Thus, the Ceci, Loftus, et al. data reveal that children tended to increasingly make false assents as they participated in more and more sessions. Hyman's adult subjects also did so (Hyman et al., 1995). In other studies, the rate of assent has not increased after the first session. At this point we are uncertain as to when the rate of buying into the false memory will increase over successive interviews and when it will not.

Taken together, these results show that people will falsely recall childhood experiences in response to misleading information and the social demands inherent in repeated interviews. The process of false recall appears to depend, in part, on accessing some relevant background information. Hyman and his colleagues hypothesized that some form of schematic reconstruction may account for the creation of false memories. What people appear to do, at the time they encounter the false details, is to call up schematic knowledge that is closely related to the false event. Next they think about the new information in conjunction with the schema, possibly storing the new information with that schema. Now, when they later try to remember the false event, they recall the false information and the underlying schema. The underlying schema is helpful for supporting the false event—it adds actual background information and provides the skeletal or generic scenes.

**THE ROLE OF IMAGINATION**

One critical element in the creation of false memories may be the part played by inducing subjects to imagine events that they do not remember happening to them. The literature contains a number of instances in which people have confused the memory of actually doing something with the memory of only imagining doing it (e.g., Anderson, 1984; Johnson, Hashtroudi, & Lindsay, 1993). However, these results usually pertain to recently experienced events of little importance, such as tracing or imagining tracing the outline of a line drawing. A recent study has shown that the simple act of imagining a childhood event increases a person’s subjective confidence that the event happened to them in the past—a phenomenon called *Imagination Inflation* (Garry, Manning, Loftus, & Sherman, 1996). In this study, subjects were asked about a long list of possible childhood events (e.g., broke a window with your hand) and they told us the likelihood that these events had happened to them as a child. Two weeks later, subjects were instructed to imagine that some of these events had actually happened to them. Then, finally, they responded for a second time about the likelihood of that long list of possible childhood events.
Consider one of the critical items:

Imagine that it is after school and you are playing in the house. You hear a strange noise outside, so you run to the window to see what made the noise. As you are running, your feet catch on something and you trip and fall.

While imagining themselves in this position, subjects answer some questions such as: "What did you trip on?" They further imagine: "As you're falling you reach out to catch yourself and your hand goes through the window. As the window breaks you get cut and there's some blood." While imagining themselves in this predicament, they answer further questions, such as: "What are you likely to do next?" "How did you feel?"

Garry et al. (1995) confined their analysis to items that subjects explicitly said were unlikely to have happened in the first place. The reason for this is straightforward. When subjects imagine something that actually did happen to them, the imagining task is actually a remembering task (Sarbin, 1995). Taking only subjects who said it was unlikely that they had broken a window with their hand, a 1-minute act of counterfactual imagination led to positive changes in a significant minority of subjects. After engaging in this act of imagination, 24% of subjects increased their subjective confidence that something like this actually happened to them. For those who had not imagined the event, only 12% showed a corresponding increase. The other seven critical items used in this study similarly showed increased subjective confidence after imagination.

These findings show that even a single act of imagining a known counterfactual event can increase the subjective likelihood that the event happened in the past. Interestingly, simply asking about the event twice also led to an increase in subjective confidence, although not as large an increase as the act of imagination produced. Other research in cognitive psychology has shown that repeating a question can increase the sense of familiarity that a subject feels the second time the question appears (Reder & Ritter, 1992). Even simply repeating some of the parts of a question can lead to these familiarity enhancing consequences. Analogously, the mere repetition of the item in the Garry et al. (1995) research might similarly produce an enhanced sense of familiarity—familiarity that is then misattributed to a possible childhood experience. This process is then exacerbated when imagination activities are introduced into the picture.

We and others have expressed concerns that imaginations may be one of the steps down the royal road to creating false memories. If so, therapists may need to think twice about the wisdom of using or recommending imagination strategies for the express purpose of eliciting allegedly buried abuse memories. Maltz (1991), for example, explicitly recommended this risky procedure: "Spend time imagining that you were sexually abused,
without worrying about accuracy, proving anything, or having your ideas make sense. As you give rein to your imagination, let your intuitions guide your thoughts” (p. 50). In a recent study of licensed clinical psychologists, a surprising 11% admitted that they had tried to help clients remember childhood sexual abuse by encouraging them to “let the imagination run wild,” and 22% said that they had done this by encouraging subjects to “give free rein to the imagination” (Poole et al., 1995). The findings of Garry et al. suggest the wisdom of the larger percentages who indicated that these techniques were inappropriate for use with suspected abuse victims. Specifically, 44% said that it was not appropriate to encourage clients to “let the imagination run wild” and 24% said it was not appropriate to encourage clients to “give free rein to the imagination.”

FINAL REMARKS

Nearly two decades of research on the misinformation effect has revealed that people can be led to remember events differently than they really were. When distortions of memory are induced in people, they can be quite confident about their false memories and express them in substantial detail. Newer work shows that you can go further with people—you can lead them to believe that entirely false events happened to them when they were children. The precise mechanisms by which such false memories are constructed out of elements of historical truth are still unknown, although engaging people in acts of counterfactual imagination may play some role. In his classic book The Go-Between, Hartley (1953) made an apt remark about the past: “The past is a foreign country... they do things differently there.” Today we might add to Hartley’s metaphor: “The past is one of many foreign countries... depending on how you want things to have been done there.”

REFERENCES


