

Are Recovered Memories Real

A growing body of evidence indicates that memory is deeply unreliable and that life-shattering events cannot be buried for years and then winched out of the deep waters of the subconscious

You are lying naked on a metal table, your legs strapped into restraints. You can see luminescent alien beings with big, froglike eyes as they move about in the darkness. They begin to cut into your body, and you are afraid they might cut out your heart. . . .

THAT DESCRIPTION COMES FROM A STUDY OF PEOPLE WHO CLAIM TO BE ALIEN ABDUCTEES, which was conducted at Harvard University and published in the journal *Psychological Science* this summer. The transcript was distilled from a recorded interview with an "abductee" and was then played back to him while researchers measured signs of post-traumatic stress disorder. Listening to his own story triggered physiological responses as pronounced as those seen in combat veterans. Similar physiological responses were measured in nine other abductees in the study.

The halls of Harvard, nestled amid the 19th-century clapboard houses and cobbled streets of Cambridge, seem an unlikely place to take extraterrestrials seriously. But the study is part of a six-year probe by Harvard psychologist Richard McNally and his colleagues into the minds of apparently sane people who believe they have memories of long-repressed events, including sexual abuse, alien abduction, and past lives. The study is an attempt to learn if humans can create memories unwittingly,

By Jill Neimark

memories so strong they may cause the debilitating symptoms of post-traumatic stress disorder.

McNally thinks people can and do make up powerful memories. And these false memories can take on a life of their own, with profound legal, political, and social consequences. If juries find plaintiffs' recovered memories credible, people go to jail. About a decade ago, a wave of cases involving recovered memories of sexual abuse tore families apart, led to lurid court trials, and spawned a branch of therapy devoted to recovered memories. Today another wave of trials are under way involving allegations of sexual abuse of children by priests. More than 500 cases of sexual abuse are pending in the Boston archdiocese alone. McNally says many of these cases involve "supposedly recovered memory."

His research suggests that all memories—even false ones—are not just accessories of experience. Memory *is* experience, McNally says, a neurohormonal event that cascades through the brain and, when accompanied by powerful emotions, is burned into synapses. And he wonders how and why the human brain does this.

There are no definitive answers yet, but there are powerful clues. With the help of sophisticated neuroimaging techniques, researchers are finding that memory's malleability is yoked to some of our most cherished aspects of intelligence: imagination, inference, and prediction.

These are the same capacities that make us Earth's dominant species. And because of this, it's likely that memory's vulnerability to error is here to stay.

AT THE TURN OF THE LAST CENTURY, FREUD INVOKED THE CONCEPT OF repression, a protective mental mode that smothers distressing emotional events. Scientists have been sparring over the nature of memory ever since, and in the last few decades the fight has become so acrimonious that psychologist Kathy Pezdek, of Claremont Graduate University in California, likens it to a religious war. Elizabeth Loftus, a psychologist at the University of California at Irvine, whose studies of false memory have made her the target of a lawsuit and a separate investigation by her former university, says her "life has been derailed" by her research. McNally echoes her: "I've had to consult Harvard's general counsel on three different occasions because of the saber rattling of trauma experts who didn't like my work." Susan Clancy, a psychologist who trained under McNally, says: "When I started this research, hate mail poured in by the ton. One colleague told me to get out of the area entirely since I'd be ruling myself out of job opportunities."

Researchers are at war because there is no definitive evidence that life-shattering events can actually be buried for years, as

Freud suggested, then winched out of the deep waters of the subconscious like a long-lost corpse. Yet people who claim to have done exactly that are tremendously convincing. Their sensory details are often striking and terrifying in their clarity. And these memories are intense enough to forever alter lives. "This experience [of abduction] really hits you in the pants," says Will Beuche, an abductee who participated in McNally's study. "All your assumptions about life are broken. It feels like everything you had based your character development on was wrong. You feel washed up on the shore with no personality at all."

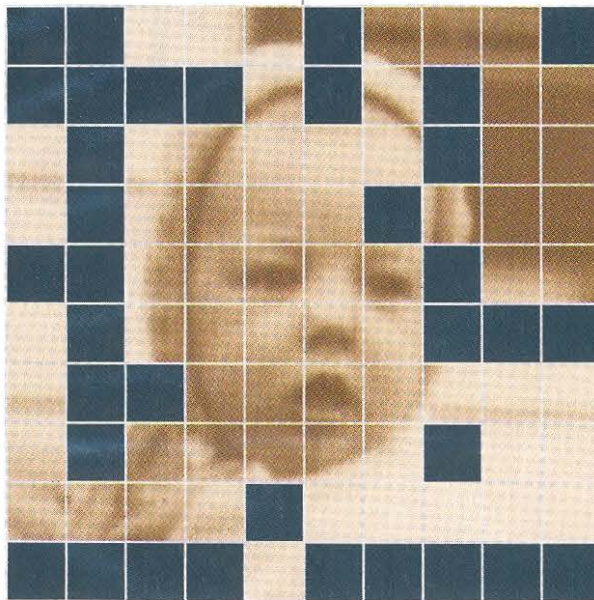
Such certainty is strong enough to convince another Harvard psychiatrist that the experiences, if not the abductions themselves, are real. John Mack, who heads the John E. Mack Institute a few minutes' walk from McNally's office, speaks of the

"ontological shock" he went through when he first listened to the stories of abductees. Mack is the author of *Abduction: Human Encounters With Aliens* and *Passport to the Cosmos: Human Transformation and Alien Encounters*. "That data operated like sulfuric acid on my worldview," he says in a film documentary. "I couldn't account for this in any way with anything I had learned."

In 1999 McNally and Susan Clancy, then a graduate student, published the first of a series of landmark studies that tried to account for such memories in a way that Mack could not. It has not been easy for psychologists

to design respectable, ethical, replicable laboratory studies on recovered memory that their peers will accept. Critics shrug off most research with the comment that lab studies say nothing about repression of real-life trauma. Since the 1970s, for instance, Loftus has been able to implant false memories in individuals in lab studies—that they were lost in a mall as children or that they hugged Bugs Bunny at Disneyland (where there is no Bugs Bunny, because he's not a Disney character). She has also shown that implanted memories can influence behavior. In one study, Loftus and her colleagues successfully led people to believe that they once got sick eating either hard-boiled eggs or dill pickles. Yet creating relatively innocuous memories in normal, healthy people may not relate to the experience of trauma victims.

So Clancy, McNally, and a Harvard colleague, psychologist Daniel Schacter, decided to initiate a study of women who claimed to have recovered memories of sexual abuse. These women were at the white-hot center of the memory wars, and yet, says Clancy, "nobody was doing laboratory research on memory formation in this population. We wanted to know whether they were prone to creating false memories." One of their studies tested four groups of women: those who'd been sexually abused and always remembered, those who believed they had been sexually abused but had no memory of it, those



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who had recovered memories of sexual abuse, and a control group who were certain they had never been abused. Each subject was given a standard word-retrieval test, in which she was presented with a list of semantically related words (*rest, dream, nap, tired*). Each was then presented with the list again, but this time a new word appeared on the list (such as *sleep*) similar in meaning to others on the original list.

Those with recovered memories of abuse recalled having seen the missing word on the first list 68 percent of the time, compared with only 38 percent for controls. The recovered-memory group scored significantly higher than any of the other three on false remembering. "There's a heightened tendency for false-memory formation in those who can recall and visualize recovered memories," McNally says.

Trauma therapists were outraged by the study. One of their objections: Perhaps the trauma had been so horrific it was not only banished from memory for years but also created memory defects that were now showing up in lab tests. So McNally and Clancy recruited individuals with recovered memories of alien abduction for the next study. Seven out of 11 of the abductees in their experiment had reported (under hypnosis) that they had their sperm or eggs extracted by aliens for breeding purposes. McNally and Clancy figured that nobody could argue that this group of subjects had post-traumatic stress disorder based on actual abuse during alien abductions that impaired their ability to remember events accurately in the lab. "We thought we'd found the perfect study group—people who clearly had created vivid, traumatic, false memories," says Clancy.

The group produced significantly more false memories on the same word-retrieval test, just as the women with recovered memories of sexual abuse had. But that study also drew ire—from both abductees as well as the general population. "That totally shocked me," says Clancy. "I got more hate mail, even from very educated people. I'd get letters asking me who I was to say these people hadn't been abducted."

The results of their latest study are even more intriguing. McNally, Clancy, and others at Harvard studied physiological stress in 10 abductees and 12 controls. Individuals were interviewed about traumatic, neutral, and pleasant experiences. Thirty-second scripts were distilled from the interviews and then recorded by Scott Orr, who runs a psychophysiology lab at the Manchester VA Medical Center in New Hampshire. Abductees listened to the recordings while hooked up to electrodes that monitor sweat, heart rate, and muscle tension. This method, using script-driven imagery, has been used many times to measure post-traumatic stress disorder in war veterans. The abductees had a significantly heightened stress response. Even McNally was surprised. "Their reactivity was as great as real post-traumatic stress patients. These people genuinely believe these events happened, and it's reflected in their physiology."

McNally thinks that one reason abductees, who are on all other measures sane and healthy individuals, are more vulnerable to false memories is a trait called absorption: "They score higher on measures of fantasy and absorption, which is the ability, for instance, to get lost in daydreams or be utterly entranced by a sunset. Their response to script-driven imagery about pleasurable moments in their lives is also higher than normal. So the upshot is, I think this stress response is a marker for intense emotional memories in people with vivid imaging capacities."

Could our cherished capacity to imagine, which gives life and art richness, be a key to false memory?

PEOPLE TEND TO VIEW IMAGINATION AS A PURELY MENTAL ACTIVITY, but it is strongly linked to vision. The work of Stephen Kosslyn, a Harvard psychologist, explains why.

Four floors down from McNally's office at Harvard's William James Hall are Kosslyn's spacious quarters. Precariously piled journals cover an oversize wooden desk, along with a plastic replica of a brain, which Kosslyn gladly takes apart for a visitor, pointing out the visual centers at the very back. Those centers are the focus of his studies.

Kosslyn began conducting neuroimaging studies of the brain (PET and fMRI) in 1990 and made a surprising discovery: Every area of the brain that is activated when we see is also activated when we create an image in our mind. "It was absolutely amazing," he says. "The primary visual cortex, the first visual area of the brain that registers input from the eyes, is even activated by imagery with the eyes closed. That suggests the opportunity for distortion is huge. The upside is, if imagery simulates what you actually see in the brain, you can use it for memory or reasoning or predicting. The downside is that you can become confused about the source of images. That's kind of scary."

One study of eight easily hypnotized individuals found that when they were simply asked to perceive a color, color areas in the brain were activated—even if they were looking at a gray scale. The control group did not show this effect. Another study found that vivid visualization accompanied by emotion triggered more activation in visual processing systems than images alone did.

The human capacity for imagination is so great that sometimes people can create delayed post-traumatic stress disorder even in the absence of remembered traumas. Psychologist Richard Bryant of the University of New South Wales in Australia studied individuals who had been in such a serious accident that they'd been knocked unconscious and had no memory of the event. A few of them later developed full-scale post-traumatic stress disorder. When Bryant interviewed them, he found they had reconstructed the accident by looking at news reports, photographs, and listening to the accounts of friends. In an act of pure imagination, they had cobbled together an accurate account that was so vividly pictured and felt that it was powerful

enough to produce post-traumatic stress disorder.

Laboratory studies suggest that the brain has a unique sensitivity to images. Psychologist Stephen Lindsay of the University of Victoria in British Columbia published a study in *Psychological Science* in March that demonstrates how pictures enhance the formation of false memories. He showed 45 students a scenario purporting to describe an event in their first-grade class. The false story told how an individual and a friend got into trouble for putting Slime, a goolike substance, in their teacher's desk. When Lindsay added a class photo from the first grade to the scenario, he found that two out of three students believed the false event happened. Lindsay was astonished at the high rate of false-memory reports: "And the false memories were richly detailed. One student commented, 'No way! I remembered it! That is so weird!'"

"We tell ourselves stories in order to live," wrote Joan Didion in *The White Album*. Perhaps it's not so baffling that what we can't recall, we invent. Memory is designed to filter the world and discard what is deemed irrelevant, says psychologist Marcia Johnson of Yale University. That we tend to home in on the details of an event is called weapon focus—we can recall with grisly clarity the gun that was pointed at us by a robber, but we may not remember his face or the other people in the store. If our brains were perfect video cameras, we'd be paralyzed by information overload. In the short story "Funes, the Memorious," Argentine writer Jorge Luis Borges imagines just such a savant and writes, "In the overly replete world of Funes there were nothing but details."

There is at least one real-life Funes, and behavioral neuroscientist James McGaugh, at the University of California at

Irvine, is studying her: "This woman came to me and said, 'My memory is too good.' For her, it's like looking at a Rolodex and seeing all the names at the same time. It's a flood of information, and it can make her life difficult."

People *never* capture anything literally, says psychologist Henry L. Roediger III of Washington University in St. Louis. "Whenever you encode an experience, you filter it through your own awareness. If we only remembered the literal words of a conversation, we might miss the meaning. If I tell you I'm really tired today because the baby was up all night, you might remember that the baby cried all night. It's an inference. We're always doing that, and that's actually very intelligent." The odd thing, though, is that we usually don't know we're confabulating. People have an unfounded confidence in their memories, says Elizabeth Loftus. She notes that in one recent study she worked on, three-quarters of the subjects reported having excellent memories. When college students were asked about the *Challenger* explosion years after it occurred, every single one remembered the spaceship blowing up, but many got the details wrong. Thus, notes Marcia Johnson, when the brain strives to re-create an event, it often grafts details of other memories onto it.

"The common wisdom was that once an experience was consolidated in long-term memory, it was stable," says neurobiologist Yadin Dudai of the Weizmann Institute of Science in Israel. "Some of us now think that a memory may return to its embryonic state when it's activated." In the lab, experiments point in both directions. Joseph LeDoux, the Henry and Lucy Moses Professor of Science at New York University, was able to block the process of encoding a conditioned fear response in rats by injecting a drug, anisomycin, into their brains. The drug inhibits

PUTTING FREUD TO THE TEST: CAN MEMORIES BE REPRESSED?

Freud's theory of repression has intrigued psychologists since the 1930s, but nobody has proved it exists. Cognitive neuroscientist Michael Anderson, who runs a memory lab at the University of Oregon, believes he's got the goods. "You don't have to subscribe to highly specialized mechanisms like the ones Freud might have proposed," says Anderson. "You can explain it with very well-respected ideas in neuroscience and psychology." For instance, he says, we all exercise what is known as executive control. We can focus our attention on one thing and ignore distractions. Scientists have shown a sequence of letters to individuals and told them that each time they see a letter, they should press a key—except when the letter *X* appears. "These are called go/no-go procedures," says Anderson. "They're set up so the individual gets into a rhythm of seeing letters and pressing the key, and when *X* appears, they have to stop themselves." Monkey studies have shown that the no-go response is associated with specific regions of the frontal cortex.

To test a similar paradigm in memory, Anderson created a think/no-think procedure for recalling word pairs. In a study they found that the subjects, when prompted, could push the second word in a learned word pair out of awareness, which made it harder to recall later. Recently, Anderson and his colleagues used the same think/no-think procedure along with fMRI. In a study published in *Science* in January 2004, they found that suppressing recollection reduced the activity of the hippocampus, the small organ that shuttles short-term memories into long-term storage. They also found greater activity in many areas of the prefrontal cortex, the same areas that are active in go/no-go procedures.

Daniel Schacter, a Harvard University psychologist, warns that Anderson's results do not address the issue of whether *traumatic* memories can be repressed. He says that Anderson's work fits Freud's first definition of repression—an *intentional* attempt to banish distressing experiences from conscious awareness. Freud later used the term to

refer to a defense mechanism that operated beyond a person's awareness. That model of repression has never been proved to exist.

Psychologist Henry L. Roediger III of Washington University in St. Louis says he has failed to replicate Anderson's work. Anderson responds that Roediger was using a slightly different and earlier design and that the results have been replicated elsewhere. Roediger says: "If repression hinges on this teeny-weeny change, then it is not very robust. I'm not saying the effect can't be obtained—I'm just saying it's hard to obtain."

"I don't subscribe to the view that repression needs to be unconscious, complete, or permanent," says Anderson. "It can be a process that requires effort over time and may lead people to forget all or part of an unwanted experience. Even if somebody doesn't forget the Holocaust, for instance, they may forget details over time. This may actually help. We need to find out how people cope with distressing memories. That's why this is a pretty damned important topic to research." —J. N.

A terrifying phenomenon known as sleep paralysis may help explain why many people believe they were abducted by aliens'

the synthesis of proteins and thus blocks the formation, or consolidation, of a memory. Twenty-four hours later, the rats' conditioned fear response seemed to disappear. Yet a study recently published in the *Proceedings of the National Academy of Sciences* found that the memory was only temporarily blocked. This time, University of Pennsylvania researchers conditioned rodents, treated them with anisomycin, and then examined them 21 days later. They remembered the conditioned behavior.

Just to confuse the issue further, research that has just been published finds that in rats conditioned to fear a shock to the foot, memory formation and subsequent recall, or reconsolidation, are actually separate processes, and thus established memories may be malleable and sensitive to disruption. Although both an original memory and its retrieval/reconsolidation may be blocked temporarily by anisomycin, University of Cambridge psychologist Barry Everitt and his colleagues found that the two processes depend on different chemicals within the hippocampus. The initial formation of long-term memory requires a chemical called brain-derived neurotrophic factor, while subsequent recall depends on a transcription factor called Zif268. The processes are related but fundamentally different—and so the researchers conclude that repeated remembering does not create a duplicate of the original memory. If we can isolate the chemicals involved in how memories are recalled, we may someday have new drugs to help treat phobias, post-traumatic stress disorder, and intrusive memories.

IN REAL LIFE, McNALLY SAYS, MEMORIES DO CHANGE. YALE UNIVERSITY psychiatrist Steven Southwick surveyed Gulf War veterans first one month, then two years after traumatic events. About half the veterans who checked off events on the first survey failed to check off some of the same events after two years had passed. The timbre and quality of memories changes over time too. McNally gave a questionnaire to personnel 6 months after a fatal shooting at a grammar school in suburban Chicago. The same questionnaire was given again 18 months after the shooting. "Each person remembered the event differently at 18 months than at 6 months," says McNally. At the second interview, those who had more severe symptoms of post-traumatic stress dis-

order recalled the event as more harrowing, while memories were recalled as less harrowing by those who had recovered.

We create our memories even as they create us—a Möbius strip, an Escher print, a double helix, if you will, from which the blueprint of self emerges. It's both dazzling and chilling to realize that the narrative arc of our lives relies on a phenomenon that is by turns robust, fallible, malleable, potent, slippery, inventive, and above all, powerfully yoked to emotion.

If we are storytellers, even inaccurate ones, how does that serve us? "What has been missing from all the theories of false memory," says Clancy, "is the desire for meaning. I think psychologists are tone deaf to this. It's a very important ideological factor in the development of any belief. Alien abductees talk about the fact that they don't feel alone in the universe any longer." When McNally and Clancy asked abductees if they were glad they'd had these experiences, "we only had one person say no. Everyone else said it was initially disorienting and frightening but that they eventually put it all in a spiritual perspective."

So how and why would an individual develop a story line as unusual as abduction? Are there any common ingredients? Part of the answer may derive from a physiologically dramatic and terrifying phenomenon called sleep paralysis. In classic sleep paralysis, a person wakes early from a dream and is unable to move (as is standard during REM sleep). In many of these cases, people also generate vivid dream images called hypnopompic hallucinations. Many alien abductees experience sleep paralysis, and if they don't understand the phenomenon and believe their otherworldly hallucinations are real, says McNally, they may seek out therapy, hypnosis, or bodywork, thereby "recovering" additional memories. "These folks are very open to what we might call New Age beliefs, such as reincarnation, energy therapies, astrology, reincarnation, and telepathy."

Will Beuche sees it this way: "I won't call abduction a spiritual experience, but by its very nature it casts you into reflection about your existence . . . you feel you're behind the scenes of a theater, of an incredible play . . . this play we're all in."

But he might as well be talking about the phenomenon of memory itself—in which we somehow weave and unweave ourselves by our own hand. ☒

