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FINDING IMPLICIT MEMORY
IN POSTHYPNOTIC
AMNESIA

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Following appropriate suggestions and the termination of hypnosis, some subjects are unable to remember the things they did or experienced while they were hypnotized—a phenomenon called posthypnotic amnesia (PHA). After the administration of a prearranged reversibility cue, the memories come back into awareness, marking this amnesia as a disruption of memory retrieval, rather than encoding or storage.

I wanted to see how PHA affected different aspects of memory (Kihlstrom, 1980). Cognitive psychologists distinguish between declarative and procedural memory, and between two forms of declarative memory, episodic and semantic. Because PHA affects memory for experiences, it should impair episodic memory but leave semantic memory intact. An earlier experiment by John Williamsen had found that PHA affected free recall and recognition of a word list memorized during hypnosis but did not prevent amnesic subjects from using the forgotten words as responses on a free-association test (Williamsen, Johnson, & Eriksen, 1965). I decided to perform a conceptual replication of his study: If you're beginning a new program of research, it's best to start where previous investigators left off, to make sure that you can see what they saw.

In my first experiment, subjects were hypnotized, memorized a list of words, like *girl*, that were strong associates of other words, like *boy*, and then received a suggestion for PHA. Highly hypnotizable subjects performed very poorly on a free-recall test administered while the amnesia suggestion was in effect but continued to use the list items as responses on a word-association test. In a second experiment, in which subjects memorized lists consisting of highly salient category instances, such as *foot*, highly hypnotizable subjects were densely amnesic on the test of free recall but still used the list items when asked to generate instances of categories such as *part of the human body*. Endel Tulving (1983) later cited this study as one of four convincing demonstrations of his distinction between episodic and semantic memory.

I had succeeded in replicating Williamsen's study, but I also had another motive for doing the experiment. Meyer and Schvaneveldt (1971) had reported semantic priming effects in a lexical decision task. Subjects responded faster to associated pairs

of words, such as *bread-butter* and *doctor-nurse*, compared to unrelated pairs such as *bread-nurse* and *doctor-butter*. Apparently, processing the first word of a related pair facilitated processing the second word. Similar priming effects had been observed in the amnesic syndrome, and I wanted to see if there were similar priming effects in PHA. Williamsen hadn't been looking for priming effects: Cognitive psychologists didn't seriously think about priming until Meyer and Schvaneveldt published their experiment more than five years later.

Would having just memorized words like *girl* make them come more readily to mind as free associates to words like *boy*? Would having just memorized words like *foot* make them come more readily to mind as instances of *part of the human body*—despite the fact that my subjects could not remember having memorized them? Yes: Priming effects occurred in PHA, just as they occurred in the amnesic syndrome.

Nobody would have been surprised to learn that priming accompanied *conscious* recollection, but at the time, nobody had a name for preserved priming during amnesia. All I could do was refer, somewhat clumsily, to “a residual effect of the original learning episode on a subsequent task involving retrieval from ‘semantic’ memory” (p. 246). Only later were these unconscious priming effects, occurring in the absence of conscious recollection, labeled as instances of *implicit memory* (Schacter, 1987). It's not a mistake exactly, but I wish I had thought of that term first.

Although my paper appeared to demonstrate a dissociation between explicit (conscious) and implicit (unconscious) memory, it wasn't completely definitive. I had compared free recall with priming and found a difference between them. But that comparison entails a confound: Free recall tests involve very minimal retrieval cues—really, they just specify the time and place the target event occurred, but the free-association and category-generation tests provided additional cues, in the form of the free-association stimuli or category labels. The most convincing demonstration of explicit-implicit dissociations come from studies where the two tests are matched for the informational value of the cues provided to the subjects. For example, *boy* should be presented as a retrieval cue in the explicit memory task as well as a free-association stimulus in the implicit memory task. But nobody realized that until much later (Graf, Squire, & Mandler, 1984). Fortunately, Amanda Barnier and her colleagues performed a conceptual replication of my experiment with matched cues and confirmed my finding (Barnier, Bryant, & Briscoe, 2001). Moreover, Dan David and his colleagues employed Jacoby's (1991) process-dissociation procedure to confirm that priming in PHA was a product of automatic (unconscious), rather than controlled (conscious), processing (David, Brown, Pojoga, & David, 2000).

At the time I did my experiment, nobody had given the name *implicit memory* to priming in the absence of conscious recollection. Nobody understood that we should match the cues provided on tests of explicit and implicit memory. And the process-dissociation procedure hadn't been invented yet. They weren't mistakes,

really, but there were certainly things I would have done differently. But the nice thing about science is that it's cumulative: each study builds on what went before. Just as I built on an earlier experiment, the later experiments built on mine, to yield a much better understanding of posthypnotic amnesia. That's the way science is supposed to work.

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CRITICAL THINKING QUESTIONS

1. What is priming, and how does it reflect implicit memory?
2. Why is it important to replicate previous research?
3. Is it important for scientists to have names for the phenomena they discover?

My Biggest Research Mistake

Adventures and Misadventures
in Psychological Research

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