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Chapter 6

**TWO MEMORY PARADIGMS:
GENUINE AND FALSE MEMORIES IN WORD LISTS
AND AUTOBIOGRAPHICAL RECALL**

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ABSTRACT

Genuine and false memories were tested in a word list task and in an autobiographical memory task. In Part I we closely replicated Roediger and McDermott's (1995) finding that semantic associates of word lists are often falsely recalled and recognized. The false recall rate for critical lures was 44% and the false recognition rate was 52%. In Part II, the repeated interviewing procedure devised by Hyman, Husband and Billings (1995) produced many rich genuine memories as well as some apparently false ones. Repeated interviewing resulted in richer and more elaborate memories in the second interview than in the first interview. Follow-up inquiries showed that several of the manufactured memories that had been accepted were similar to actual past experiences. For genuine memories, the correlations between recall of items presented in word lists and recall of true childhood events were all near zero. For false memories, the low incidence of false recall in autobiographical memory did not allow meaningful correlations across paradigms. The evidence presented here supports three conclusions. First, as has also been shown by others, the results of Deese (1959) and Roediger and McDermott (1995) are readily replicable. Having seen lists of associates of a non-presented critical word, participants will often falsely "recall" and "recognize" that word in subsequent tests. Second, the method of Hyman et al. (1995) can indeed result in participants' accepting a false childhood memory. But not all such cases can be taken at face value; one must guard against the possibility that the accepted memory happened to fit an actual experience and hence was not entirely false. Third and final, we underscored the need to examine the relationship between genuine and false memories across the two paradigms. While it is likely that one is driven by associations and the other by schemata and self-narrative, research targeted at memory performance in word-list tasks and in episodic memory tasks should explore commonalities and differences in memory functioning and associated personality traits. We caution against drawing conclusions from word-list memory to memory for life events.

INTRODUCTION

Recent research on the creation of false memories has been of two kinds. On the one hand are studies using fabricated childhood events (Hyman, Husband and Billings, 1995; Loftus, 1993), in which participants are persuaded to "remember" experiences that never happened. These constructed memories are closely analogous to the kinds of confabulation that occur outside the laboratory, e.g. in the so-called *false memory syndrome*. On the other hand are experiments using word lists, in which participants are induced to "remember" words that have not actually been presented (Roediger and McDermott, 1995). Can such intrusions also be regarded as models of naturally occurring false recall? The relevance of word lists to everyday memory, which has been disputed for many years (Banaji and Crowder, 1989; Bartlett, 1932; Neisser, 1978, 1991), can be questioned in this case as well (Freyd and Gleaves, 1996; Roediger and McDermott, 1996). The present study, in which the same individuals participated in both procedures, was designed to explore this question empirically.

In the life-events paradigm developed by Hyman et al. (1995), each participant is repeatedly interviewed about a set of childhood experiences. Most of these are real events that the participant has actually experienced (according to information supplied by a parent), but one of them is a fabrication devised by the experimenter. When the fabricated event is first described, most participants correctly report that they do not remember it. By the second or third interview, however, about 20% of the college students tested by Hyman and his associates accepted all or part of the fabricated information as genuine.

Deese's (1959) word-list paradigm, as recently revived by Roediger and McDermott (1995), uses lists in which each word is semantically associated to a key nonpresented item. *Bed, rest, awake, tired, dream, wake, snooze, blanket, doze, slumber, snore, and nap*, for example, are all associates of the "critical lure" *sleep*. After hearing the list, participants write down as many items as they can remember. When a number of such lists have been presented they are given a recognition task, in which they must distinguish previously presented words from distractors. Besides correctly recalling and recognizing words that had actually been on the lists, they often falsely "recall" and "recognize" the critical lures that were never presented.

In most research with these paradigms, interest has focused on the occurrence of false memories: acceptance of fabricated life events and recall/recognition of critical lures. However, both paradigms also elicit genuine memories: recall of real life events in one case, of actually presented words in the other. Moreover, these memories may be elicited more than once. Indeed, this always happens in Hyman's life-event method; it is also sometimes incorporated in the design of studies using word lists (McDermott, 1996). Thus, these paradigms can also be used to study the effects of repeated recall on genuine memories.

Do these two procedures converge on the same underlying processes? One approach to this question, incorporated into the design of the present study, relies on correlational methods. Does a good memory for actually-presented words go with a rich and descriptive memory for childhood events? And does susceptibility to false recall/recognition of words go with a readiness to accept fabricated childhood events as genuine? Recent research on memory distortions in word-list tasks and in episodic-memory tasks found that women who reported recovered memories of sexual abuse were more prone to false memory in the word

list task than control participants (Clancy, Schacter, McNally, and Pitman, 2000), and that individuals who reported recovered and repressed memories of alien abduction were also more prone to false memory in the Deese-Roediger-McDermott paradigm (Clancy, McNally, Schacter, Lenzenweger, and Pitman, 2002). Other work found a negative correlation between autobiographical memory accuracy and false memory in the word list task, with individuals who had less accurate autobiographical memories more likely to falsely recall target lures (e.g., Platt, Lacey, Iobst, and Finkelman, 1988). However, other studies that focused on the relationship between autobiographical memory and memory for word lists have yielded mixed results, reporting that performance on word lists was not a good predictor of an individual's performance in everyday memory tasks (e.g., Wilkinson and Hyman, 1998). The word list task in its present form has no significant conceptual structure and involves no self-reference; it depends entirely on associative processes. Memory for life events, in contrast, serves as a primary source of self-narrative and self-concept (Neisser, 1988). The two types of memory may not necessarily tap into the same type of processing.

The present study had two main parts. In the first part, which included 140 participants, Roediger and McDermott's (1995) paradigm was used to elicit genuine and false memories of words presented (or not presented) in lists. As will appear below, we replicated their findings very closely. Forty seven of these individuals also participated in the second part, in which Hyman's paradigm was used to study memory for real and fabricated childhood events. Five of them seemed to accept a fabricated event, but after further inquiry we determined that only one of these was a clear-cut case of false memory. We also examined the effects of repeated recall on memory of the genuine events; here the results conformed to what Matthew Erdelyi has called "hypernesia": the tendency of repeated recalls to produce richer and perhaps more accurate memories (Erdelyi and Kleinbard, 1978). Finally, we looked for correlations between memory scores obtained in Parts I and II.

PART I: THE WORD-LIST PARADIGM

Part I was modeled after the work of Roediger and McDermott (1995), who used word lists composed of semantic associates of a nonpresented item. That study elicited high levels of false recall and recognition: participants "recalled" the lures after 40% of the individual lists and falsely identified 80% of the critical lures as "old" in the subsequent recognition test. In 58% of those false recognitions, they said they remembered the actual experience of hearing the lure (as opposed to just "knowing" that it had been presented). We replicated the procedures of Roediger and McDermott's (1995) Experiment 1, with the addition of the *Remember/Know* judgments from Experiment 2.

Method

Participants

One hundred and forty students enrolled in an undergraduate course participated in Part I, which took place during the Fall semester. They received credit toward a methodology requirement for their participation.

Materials and Stimuli

Six word lists were chosen from those used by Roediger and McDermott (1995). Each list consisted of 12 words, all associates of a critical lure that was not presented. The critical lures were *chair, mountain, needle, rough, sleep, and sweet*. For example, the list constructed from associates of *chair* was *table, sit, legs, seat, couch, desk, recliner, sofa, wood, cushion, swivel, stool*. A tapeplayer presented the lists at a rate of one word every 1.5 seconds.

For the recall task, participants were provided with a blank form to complete after each list. For the recognition task they were given a list modeled after that used by Roediger and McDermott. The 42 items on the recognition list were grouped in six blocks of seven words each: 3 previously presented words, 3 new words, and the critical lure word. Each block corresponded to one of the original lists, and they were presented in the same order in which the original lists had occurred.

Procedure

Participants were run in groups of varying size (5 to 45). They were told that they would hear lists of words and that at the end of each list they should write down as many of the words from that list as they could remember. Participants were asked to recall the last few words first and the rest in any order. They were also asked not to guess, i.e. to be reasonably confident that each word they wrote down had actually been on the list. They were given 2 minutes after each list to complete this task.

When all 6 lists had been presented and recalled, the recognition task was given. Participants were asked to mark each of the 42 words as "old" if it had appeared on any of the previous lists and as "new" if it had not. For items judged "old," they were also asked to indicate whether they actually *remembered* hearing the word, or simply *knew* that it had been presented.

After the recognition test, participants were told that there would be a second part of the study which would focus on memory for childhood experiences. Those who were interested in participating in Part II were asked to provide the name and mailing address of their parent(s). A total of 107 students volunteered to do so.

Results

Our results closely replicated those of Roediger and McDermott (1995). Sixty six percent of the studied words were recalled correctly, i.e. about 7 or 8 from a list of 12. The mean number of critical lures falsely "recalled" by participants was 2.64 (of 6 possible). This proportion, 44%, is comparable to the 40% reported by Roediger and McDermott (1995). The mean number of critical lures falsely judged as "old" in the recognition portion of the experiment was 5.11 (of 6 possible). As in the work of Roediger and McDermott, a substantial proportion (52%) of these falsely recognized lures were judged to have been actually *remembered*; only 32% of them elicited the *know* judgment. (No *remember/know* distinction was indicated on the remaining items.)

The three measures used in this part of the study - correct recall, false recall, and false recognition - were correlated in predictable ways. False recall correlated positively with false recognition, while the number of correctly recalled words was inversely related to both false recall and false recognition. (See Table 1.) In other words, participants who correctly recalled more of the presented words produced relatively fewer false recalls and recognitions.

Discussion

Our replication of Roediger and McDermott's study was successful. High rates of intrusion of semantically related non-presented words were found in both the recall and the recognition tasks. While these "false memories" of non-presented words represent an interesting phenomenon, their relation to other forms of false memory remains to be established. Equally unexplored is the relation between genuine memory in the word list paradigm and recall of real life events. The second part of our study deals with memories of the latter kind.

PART II: THE CHILDHOOD MEMORY PARADIGM

It has long been known that memory for life events is susceptible to distortion (Neisser and Harsch, 1992; Ross, 1994). Under some conditions, it is also possible to establish "memories" of events that never occurred at all. In one case Chris, a 14-year-old boy, was led to believe that he had been lost in a shopping mall at the age of 5 (Loftus, 1993). Two days after the initial interview Chris "recalled" his feelings at the time; in subsequent recalls he added many other details. Systematizing Loftus's procedure, Hyman and his colleagues (Hyman, Husband and Billings, 1995; Hyman and Pentland, 1996; Hyman and Billings, in press) asked parents of college students to describe events that had happened to those students between the ages of 2 and 10. In subsequent interviews with the students, four real events described by the parents and one experimenter-fabricated event were discussed. About 20% of the participants were persuaded to accept the fabricated events, or at least to incorporate information about them into existing memories.

The method used to induce false memories in these studies is similar to the memory recovery techniques used in some forms of therapy (Poole, Lindsay, Memon, and Bull, 1995). The incentive to accept a remembered event as real may be especially strong in a therapeutic setting, where recovery of traumatic memories is often regarded as an essential part of the treatment. If the client expresses surprise that he or she had not remembered the events prior to entering therapy, the therapist may suggest that the client's parents (and others) had probably suppressed all mention of them. This suggestion may make it easier to accept "memories" that seem unfamiliar at first.

A condition intended to simulate this suggestion was incorporated in the design of our experiment. Participants were divided into three groups. In one group the fabricated event was "going to the hospital overnight," a suggestion taken from Hyman's studies. To examine the effect of a slightly more aversive suggested memory, the second fabricated event was "You were riding in a car when the car hit a dog." In the third group, intended to simulate the

"conspiracy of silence" described above, we expanded the "hit a dog" instructions by saying that parents had deliberately never mentioned the event before.

To explore Erderly's (Erderly & Kleibard, 1978) hypothesis that repeated recall of life events can lead to hypermnesia, our design also made it possible to compare participants' recalls of genuine childhood experiences on two successive occasions. We predicted that they would provide clearer and richer accounts of autobiographical events in the second interview than in the first, and that repeated recall would change both participants' and experimenters' judgments of how well those events were remembered.

Method

Participants

Questionnaires were sent to the parents of the 107 students who had provided addresses at the end of Part I. Fifty of these were returned, and the students to whom they pertained were invited to participate in Part II during the spring term; 47 actually did so. The data from these 47 students were used in all analyses of memories for genuine events. Unfortunately, we learned halfway through the experiment that 15 of them had participated just after covering the topic of false memories in a psychology course. Although these students were also presented with a fabricated event, their responses to that event were not included in the analysis. (As might be expected, none of them accepted the false memory and almost all guessed the purpose of the study.) The data from three other students, whose responses had been used in piloting and modifying the suggested events, were also eliminated from the fabricated-event analysis. Thus, only 29 were available for the study of suggested false memories. They were randomly assigned to the three conditions: "Hospitalization" (n=9), "Hit Dog" (n=10), and "Hit Dog + Additional Instructions" (n=10). As compensation for participation, all participants received two tickets to the cinema, and those enrolled in psychology courses also received credit toward methodology requirements.

Materials and Stimuli

The letters sent to parents stated that we were studying the memories of college-age men and women for events that happened when they were children. Parents were asked to describe things that their child had experienced between ages 2 and 10. A questionnaire listed various types of events as cues: getting lost, going to the hospital, an eventful birthday, an event involving a pet, a family vacation, interaction with a prominent or famous person, winning a contest, a car event, a wedding, mischief with a friend, and one other thing that they believed their child would remember. For each event they were asked to provide a narrative description of what happened as well as their child's age at the time, the event's location, who else was present, how the child had reacted, whether there were any mementos that might have helped them remember it, and how often the family had talked about it. Finally, they were asked not to talk to their child about the events until the end of the term.

Four actual childhood events from each returned questionnaire were used as "genuine events" in the memory interviews. One of the following three fabricated events was also included:

- (1) "The time when you had to go to the hospital and stayed there overnight. You were about 5 years old, and it was due to high fever and a possible ear infection."
- (2) "The time when you were riding in the car and the car hit a dog. You were about 4 years old, it was getting dark outside, and it was a big black dog. You were very upset about it."
- (3) The third group received additional instructions in connection with the "hit-a-dog" event: "It says here that your parents decided never to mention it to you, because you were so upset. So there was never any talk about it. Maybe that's why you have trouble remembering it right away."

Procedure

Two interviews were scheduled with each participant, two to six days apart. All were tape-recorded. Thirty-two of the participants were interviewed by the principal investigator, the remaining 15 by a trained undergraduate assistant.

During the first interview, participants were told that we were interested in how well people remember childhood experiences and that they would be asked about events that had been described by their parents in the questionnaire. They were encouraged to recall as much about each event as possible, and in case of difficulty to try and think of relevant information that might help them remember it. They were then presented with cues to the five events, one event at a time. The first, second, fourth, and fifth were genuine events, the third was the fabricated event. (The extra instructions for the third condition were given after they had completed their attempted recall of the fabricated event.) As the participant recalled each event, the experimenter rated each memory on a 5-point scale *Index of Memory* (IM) scale. The IM scale was modeled after that used by Hyman and his associates. A rating of 1 corresponded to no memory and no attempt at remembering any possible relevant information; a rating of 2 corresponded to no memory, but trying (this included discussion of relevant information and recall of other incidents of the same type); a rating of 3 corresponded to partial memory, including some details but with critical information about the event itself still missing; a rating of 4 corresponded to full memory, including the critical information; a rating of 5 corresponded to rich and detailed memory, including additional elaborations. The same scale was used for rating recalls of both true and fabricated events. The experimenter's IM ratings were made during the interviews, in real time. For reliability purposes, the principal investigator also coded the interviews of the 15 participants interviewed by the undergraduate assistant, using the audiotapes. For these 60 cases (15 participants X 4 true events), the correlations between the two scorers was 0.97 for the first interview and 0.94 on the second. Scores on the single fabricated event were assigned later, by inter-experimenter discussion.

During the course of the interview, but after the experimenter rated recall, participants were asked to rate the clarity of each memory on a 5-point scale: (1) you don't remember it at all; (2) you may possibly remember parts of it vaguely; (3) you remember it vaguely; (4) you remember it, but not very clearly; (5) you remember it very clearly and very well. At the end of the second interview to provide confidence ratings for each memory on a 5-point scale from (1) "not confident at all" to (5) "completely confident."

At the end of the interview, participants were asked to continue thinking about the events, but not to discuss them or the experiment with anyone, including their parents. The protocol for the second interview was the same for all conditions. Participants were asked about the real and fabricated events just as before. At the end of the interview they rated their confidence that they had remembered each event the way it actually happened. They were asked whether they had discussed the memories or the study with anyone since the beginning of the experiment and also what, in their opinion, had been the focus of the experiment. A complete debriefing followed.

Wherever possible, a parent of each student who had seemed to accept the fabricated event was subsequently contacted by phone. The purpose of this call was to determine whether, by any chance, an event similar to the fabricated one had actually been experienced by the participant. The experimenter described the fabricated event to the parent and asked whether any similar event had ever been experienced by the child.

Results

Memory for True Events

The true events were remembered very well, in the sense that the recalls were rich and clear. With $N=47$, the mean clarity rating was 3.75 (max 5), averaged across 4 events in each of 2 interviews; the mean confidence ratings of the same participants was 3.74. The Index of Memory (IM), as judged by the experimenter, averaged 3.94. These three measures were highly intercorrelated, as shown in Table 1.

Table 1. Correlations between Part I and Part II. (In Part II, data are for true events only.) For the top three rows $N=140$, for the bottom three rows $N=47$. * $p<0.05$

	Part I			Part II		
	False Recall	False Recognition	Correct Recall	Experimenter Rating	Participant Rating	Confidence
Part I						
False Recall	—					
False Recognition	0.619*	—				
Correct Recall	-0.383*	-0.388*	—			
Part II						
Experimenter Rating	-0.074	0.017	-0.043	—		
Participant Rating	-0.139	0.04	-0.065	0.814*	—	
Confidence	-0.205	-0.018	-0.14	0.658*	0.697*	—

Memory for Fabricated Events

In our initial scoring, based only on the interview data, "acceptance" of a fabricated event was defined by an IM score of 3 ("partial memory") or better in the second interview. This criterion was met by:

- 2 of the 9 participants in condition 1 ("hospitalization");
- 3 of the 10 participants in condition 2 ("hit a dog");
- 0 of the 10 participants in condition 3 ("parents decided never to mention it").

Four of the five participants who accepted the fabricated memory did so with an IM score of 3; the fifth, whom we will call NN, received an IM of 4. The entire transcript of NN's acceptance of this fabricated memory is given in Table 2.

Table 2. Transcript of interviews with participant NN

<i>Interview #1</i>	
<i>Experimenter:</i>	The next event is the time you were riding in the car and the car hit a dog.
<i>NN:</i>	I don't remember that.
<i>E:</i>	Don't remember that... You were 4 years old, and it was getting dark outside, and the car hit a big black dog, and you got upset about it.
<i>NN:</i>	I did? I don't remember that at all. But I do remember my brother, he hit a dog. He hit a dog and it was... it was really disgusting 'cause it was on the bottom of his tire and it was just really bad. But I don't remember hitting a dog.
<i>E:</i>	You weren't driving, you were in the car. You weren't the one who hit the dog.
<i>NN:</i>	I don't remember that very well.
<i>Interview #2 (3 days later)</i>	
<i>E:</i>	The next event is the time when you were riding in the car and the car hit a dog.
<i>NN:</i>	I can vaguely remember it, but I can't really tell the story.
<i>E:</i>	Tell me what you remember.
<i>NN:</i>	I think it was really dark outside 'cause it was a dark dog. And we were just driving on the road. And I don't know if we were picking somebody up or... I don't remember if we were going home, but we hit this dog. And I don't even remember getting out of the car. I have no idea after that. I just remember driving in the car and hitting the dog.
<i>E:</i>	Do you remember what kind of dog it was?
<i>NN:</i>	I think it was a big dog. A big dog, yeah, that's right! Yeah! It was a big dog and we thought it was something else. We thought it was like a wolf or something. I don't know what kind it was. I don't keep track of dogs.
<i>E:</i>	OK. Anything else that you remember about it?
<i>NN:</i>	I kind of felt bad for the dog 'cause we hit it.
<i>E:</i>	Anything else?
<i>NN:</i>	No.
<i>E:</i>	Do you remember how old you were?
<i>NN:</i>	No, but I was pretty young 'cause I don't remember it that well. Four or five, or six. No, not 6. Four or five.
<i>E:</i>	Great. What was your emotional response at the time?
<i>NN:</i>	Probably I felt bad for the dog.

These results across the three groups suggest that our "parental silence" hypothesis had been mistaken: *no* subject in Group 3 accepted the fabricated memory. (Participants said things like "My parents would never do that!") The data in Groups 1 and 2, however, were similar to those reported by Hyman and his collaborators: 5 of the 19 participants (26%) had accepted at least some false information.

Further investigation revealed, however, that not all of these five "accepted" memories were actually false. First, a recheck of the parents' questionnaires revealed that one of the participants in the "hospitalization" condition had in fact once gone to the hospital with an earache. Three of the other parents were then contacted by telephone (the fourth could not be reached), and two of them reported that a similar event had in fact happened to their child. Using the criteria established by Hyman, Husband and Billings (1995), we could still have counted these participants as having partially accepted the false memory if their recalls had included any suggested details that were not part of the original event. However, no such details were included by these subjects. Thus we were left with only one clearly false memory: that of *NN*, whose father strongly asserted that nothing like the "hit a dog" scenario had ever happened to her.

Effect of Repeated Recall

Paired-samples t-tests were performed to examine the effect of repeated recall. For the four true events, the experimenter's mean IM scores were 3.86 in the first interview and 4.03 in the second, a significant difference ($t = -4.080$, $p < .001$). A similar trend appeared in the participants' mean clarity ratings: the respective means were 3.65 and 3.83 ($t = -3.484$, $p = .001$). This can be regarded as an instance of Erdelyi's "hypermnnesia."

Correlations between Parts I and II

Having obtained only one confirmed acceptance of an entirely false event in Part II, we were unable to examine the correlation between false memories in the two paradigms. Descriptive analyses of performance across the two parts of the study for *NN*, the participant who yielded a clear false memory of hitting a dog, showed that she falsely recalled a total of 3 critical lure words in the word-list part of the study (compared to the average mean of 2.6 for the other participants) and falsely recognized 5 critical lure words (compared to the average mean of 5.1 for the other participants). These observations suggest that her false memory in the word list part of the study was somewhat higher in the recall task and comparable in the recognition task to that of participants who did not accept a false autobiographical memory.

We also examined the relation between the two types of true memories. As Table 1 shows, these analyses did not reveal any significant correlations. None of the dependent variables from Part I - the number of words correctly recalled, falsely recalled, or falsely recognized - were correlated with any of the variables in Part II - experimenter's ratings of memory, participant's ratings of clarity, or participant's confidence ratings. We also examined the correlations between the variables in Part I and the *changes* in memory ratings as a result of repeated recall; these too were small and not significant. In short, the measures within each part of our study were strongly intercorrelated, but the correlations across those two parts were negligible.

Discussion

Memory for True Events

Overall, the participants were quite good at remembering the events described by their parents. This is not surprising, since we had asked parents to provide salient events and many were selected from age 4 or later, well after the offset of childhood amnesia (Usher and Neisser, 1993). However, we found that repeated recall of these events produced memories that both the participants and the experimenter rated as more clear and rich.

Memory for Fabricated Events

Although the example of NN confirms that Hyman's paradigm can induce false memories, we did not obtain as many of these as might have been expected. Our results emphasize the importance of checking out each apparent acceptance of a fabricated event: three of the memories initially classified as "false" turned out to have some basis in the participant's actual experience. It is also worth noting that the results did not support "the parental silence hypothesis." The instructions to Group 3, which included the claim that all mention of the event had been deliberately suppressed, did not increase the likelihood that it would be accepted.

CONCLUSION

The evidence presented here supports three conclusions. First, as has also been shown by others (e.g. Winograd, Peluso, and Glover, 1998; Schacter, 1996), the results of Deese (1959) and Roediger and McDermott (1995) are readily replicable. Having seen lists of associates of a non-presented critical word, participants will often "recall" and "recognize" that word in subsequent tests. Second, the method of Hyman et al (1995) can indeed result in participants' accepting a false childhood memory as genuine. But not all such cases can be taken at face value; one must guard against the possibility that the accepted memory happened to fit an actual experience and hence was not entirely "false." Third and final, our study underscores the need to examine the relationship between genuine and false memories across the two paradigms. While our own work did not find a relationship between memory for word lists and memory for childhood events for genuine memories (likely due, in part, to differences between the two dependent measures), it was unable to look at the relationship for false memory. In general, it seems that while studies that have attempted to instill a false autobiographical memory in the laboratory (e.g., our study, as well as Wilkinson and Hyman, 1998) did not find a relationship between memory in word lists and real life, studies that have focused on specific groups -- such as individuals with Post-Traumatic Stress Disorder (Zoellner, Foa, Brigidi, and Przeworski, 2000), people who believe they have been abducted by aliens (Clancy, McNally, Schacter, Lenzenweger, and Pitman, 2002), and women who report recovered memories of childhood sexual abuse (Clancy, Schacter, McNally, and Pitman, 2000) -- find an increased rate of false memory in the word list task in these population groups compared to control participants. It is possible, then, that the relationship

between the two types of false memory is robust enough to be detectable in special groups, but is weaker or non-existent in the general population. It is also possible that this is because a third factor, a variable other than memory, such as a personality trait, drives instances of false memory in both paradigms. Individual differences related to memory errors have been found on tests of dissociation (Wilkinson and Hyman, 1998), mental imagery, (Winograd, Peluso, and Glover, 1998), and absorption (Platt, Lacey, Iobst, and Finkelman, 1998). Future research on individual differences in susceptibility to false memory and on the relationship between memory for word lists and for real life events is likely to prove fruitful in explaining general mechanisms of memory functioning. At this point, we caution against drawing conclusions from word-list memory to memory for life events and suggest that more work is needed to settle the issue.

REFERENCES

- Banaji, M. and Crowder, R. (1989). The bankruptcy of everyday memory. *American Psychologist*, 44, 1185-1193.
- Bartlett, F. C. (1932). *Remembering*. Cambridge: Cambridge University Press.
- Clancy, S.A., McNally, R.J., Schacter, D.L., Lenzenweger, M.F., and Pitman, R. (2002). Memory distortion in people reporting abduction by aliens. *Journal of Abnormal Psychology*, 111, 455-461.
- Clancy, S.A. Schacter, D. L., McNally, R. J., Pitman, R. K. (2000). False recognition in women reporting recovered memories of sexual abuse. *Psychological Science*, 11, 26-31.
- Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of Experimental Psychology*, 58, 17-22.
- Erderyi, M. H., and Kleinbard, J. (1978). Has Ebbinghaus decayed with time?: The growth of recall (Hypermnnesia) over days. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 275-289.
- Freyd, J. J., and Gleaves, D. H. (1996). "Remembering" words not presented in lists: Relevance to the current recovered/false memory controversy. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22, 811-813.
- Hyman, I. E., Jr., Husband, T. H., and Billings, J. F. (1995). False memories of childhood experiences. *Applied Cognitive Psychology*, 9, 181-197.
- Hyman, I. E., Jr., and Pentland, J. (1996). The role of mental imagery in the creation of false childhood memories. *Journal of Memory and Learning*, 35, 101-117.
- Hyman, I. E., Jr., and Billings, F. J. (1998). Individual differences and the creation of false childhood memories. *Memory*, 6, 1-20.
- Loftus, E. F. (1993). The reality of repressed memories. *American Psychologist*, 48, 518-537.
- Marian, V. and Neisser, U. (1997, July). Word lists and autobiographical events: The false memory paradigms. In A. Crossman (Chair), *Psycho-legal implications of "False Memory" research*. Symposium conducted at the Second Biennial Conference of The Society for Applied Research in Memory and Cognition, Toronto, Canada.
- Marian, V. (1996). *Recall and false recall of childhood events and word lists*. Unpublished master's thesis, Emory University, Atlanta, GA.

- McDermott, K.B. (1996). The persistence of false memories in list recall. *Journal of Memory and Language*, 35, 212-230.
- McNally, R. J. (2003). Recovering memories of trauma: A view from the laboratory. *Current Directions in Psychological Science*, 12, 1, 32-35.
- Neisser, U., and Harsch, N. (1992). Phantom flashbulbs: False recollections of hearing the news about Challenger. In E. Winograd and U. Neisser (Eds.), *Affect and accuracy in Recall: Studies of "flashbulb" memories*. New York: Cambridge University Press.
- Neisser, U. (1991). A case of misplaced nostalgia. *American Psychologist*, 46, 34-36.
- Neisser, U. (1988). Five kinds of self-knowledge. *Philosophical Psychology*, 1, 35-59.
- Neisser, U. (1978). Memory: What are the important questions? In M. M. Grunenberg, P. E. Morris, and R. N. Sykes (eds.), *Practical Aspects of Memory*. London: Academic Press.
- Platt, R.D., Lacey, S.C., Iobst, A.D., and Finkelman, D. (1998). Absorbtion, dissociation, and fantasy-proneness as predictors of memory distortion in autobiographical and laboratory-generated memories. *Applied Cognitive Psychology*, 12, S77-S89.
- Poole, D., Lindsay, S., Memon, A., and Bull, R. (1995). Psychoterapy and the recovery of memories of childhood sexual abuse: U. S. and British practitioners' opinions, practices, and experiences. *Journal of Consulting and Clinical Psychology*, 3, 426-437.
- Roediger, H. L. III, and McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21, 803-814.
- Roediger, H. L. III and McDermott, K. B. (1996). False perceptions of false memories. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 22, 814-816.
- Ross, M. and Buehler, R. (1994). Creative remembering. In Neisser, U. and Fivush, R. (Eds.) *The remembered self: Construction and accuracy in the self-narrative*. Cambridge: Cambridge University Press.
- Schacter, D. L., Verfaellie, M., and Pradere, D. (1996). The neuropsychology of memory illusions: False recall and recognition in amnesic patients. *Journal of Memory and Language*, 319-334.
- Usher, J.A. and Neisser, U. (1993). Childhood amnesia and the beginnings of memory for four early life events. *Journal of Experimental Psychology: General*, 122, 155-165.
- Wilkinson, C. and Hyman, I.E., (1998). Individual differences related to two types of memory errors: Word lists may not generalize to autobiographical memory. *Applied Cognitive Psychology*, 12, S29-S46.
- Winograd, E., Peluso, J. P., and Glover, T.A. (1998). Individual differences in susceptibility to memory illusions. *Applied Cognitive Psychology*, 12, S5-S27.
- Zoellner, L.A., Foa, E.B., Brigidi, B.D., and Przeworski, A. (2000). Are trauma victims susceptible to "false memories"? *Journal of Abnormal Psychology*, 109, 517-524.

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