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SUMMARY. In this article, the phenomenon of delayed recall for traumatic memories is considered, and the recovered memory interpretation and the false memory interpretation for this phenomenon are articulated. A major tenet in the false memory interpretation is the claim that delayed recall of traumatic memories results from the suggestive planting of memories for events that did not actually occur. However, this view assumes a very powerful construct of suggestibility. In this chapter, recent research from our laboratory on the suggestibility of memory is reviewed to assess if the construct of suggestibility is sufficiently robust to account for this effect. In particular, four constraints on the suggestibility of memory are discussed and related to memory for traumatic events. These constraints are (a) the familiarity of the original event, (b) whether the original event is consistent or inconsistent with expectations, (c) whether the suggestion is to change or to plant a memory for the original event, and (d) the plausibility of the suggested false event. Research on each of these constraints is presented. Based on this cognitive analysis of the recovered memory/false memory debate, it is concluded that suggestibility does not appear to be a sufficiently strong cognitive construct to explain the delayed recall phenomenon.

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A number of critical questions have been raised over the past decade regarding the credibility of adults’ memory for their childhood experiences. These questions have been raised by members of the False Memory Syndrome Foundation (see for example, Loftus, 1993) and others, who have claimed that childhood memories are simply not reliable, and in particular, that it is relatively easy to suggestively plant memories for events that did not occur. The context for this claim is the increase in the past ten years in the number of cases of people, who in their adulthood, have recovered access to previously inaccessible memories of having been sexually abused as children. In response to these claims, parents of some of the alleged victims have asserted that they did not sexually molest their children, but that these ideas were suggested to their children by overzealous therapists, the media, or by self-help books on the topic of sexual abuse. The ensuing debate has been termed “the recovered memory/false memory debate” (Pezdek & Banks, 1996).

One step toward solving this debate would be to develop a Pinocchio test for determining whether each account relates a true or a false event, and some steps have been taken in this direction. However, although accounts of memories for true and false events tend to differ in predictable and statistically significant ways, the tools available for determining the veracity of memory accounts are far less than perfect (see Pezdek & Taylor, 2000, for a discussion of this work).

In this debate we have a classic case of two interpretations of the same effect, and the task is to discern which interpretation can best account for the available data. This is the type of problem that scientists approach on a daily basis; such problems are the driving force behind the scientific method. In this article each side of the recovered memory/false memory debate will be summarized and then some of the recent research that addresses the constraints on suggestibility in accounting for memories for abuse will be examined.

Although the type of traumatic events cited herein are primarily those related to childhood sexual abuse, it is important to remember that a range of other sources of psychogenic amnesia have also been identified (see Arrigo & Pezdek, 1997, for a recent review of this research). Psychogenic amnesia refers to a deficit in memory that is precipitated by psychological stressors rather than by organic insult, and has as its major symptom the loss of
memory for information acquired normally prior to the onset of the stressors. The models, processes, and mechanisms developed to account for amnesia and recovery of memory for sexual abuse should account for psychogenic amnesia from other traumatic events as well.

At the outset, three disclaimers are warranted. First, I want to clarify that the research upon which this chapter is based is not research that involves memories for real traumatic events. It is research that has focused on isolating specific cognitive factors that affect the suggestibility of memory. This work has been conducted using controlled studies so that the underlying cognitive processes can be identified and assessed. Research on memory for real traumatic events has an important role in the field, however it does not inform the specific issue at hand. Second, although allegations of false memories have, by and large, been raised against adults, the work reported here includes research conducted with both adults and children. Third, an important factor in relating suggestibility to memory for abuse involves the time interval between the alleged event and the suggestion. Unfortunately, this factor has not received sufficient attention in the research literature.

THE RECOVERED MEMORY INTERPRETATION

According to the recovered memory interpretation, a traumatic event did actually occur, but due to the traumatic nature of the event, the event was made inaccessible for some period of time. Often some years later, often in adulthood, a triggering event stimulates memory for the event and the memory becomes accessible. There have been numerous interpretations of why traumatic events are sometimes rendered inaccessible in memory and subject to psychogenic amnesia. One interpretation is that the traumatic memory is repressed or dissociated from consciousness to defend against awareness (see, for examples, Freud, 1896 and Janet, 1904, for discussions of this position) or to maintain attachment with an individual that the victim’s survival depends upon (Freyd, 1996). Another interpretation is based on the finding that active attempts to inhibit retrieval of information from memory can reduce access to that information (see Michael Anderson’s article in this volume for a discussion of this notion of retrieval induced forgetting). Several neurobiological models are available as well to account for the inaccessibility of memories for traumatic events (Bremner, Krystal, Charney, & Southwick, 1996; van der Kolk, 1993).

The False Memory Interpretation

According to the false memory interpretation, a traumatic event did not actually occur. Rather, memory for the event was suggestively planted. Ordi-
narily the traumatic event is suggestively planted in relative close temporal proximity to when the event is actually reported. This would explain why for many years, often from childhood to adulthood, there was no memory for the event; the event simply never occurred. This interpretation is most clearly articulated by Loftus (1993). Loftus has suggested that the two major sources of false memories are popular writings, such as *The Courage to Heal* (Bass & Davis, 1988), and suggestive therapeutic techniques. According to the recovered memory interpretation, traumatic memories may occur during therapy or after exposure to self-help books on sexual abuse, because something in this material serves as an effective retrieval cue to trigger a previously inaccessible memory. On the other hand, Loftus, and those who hold the false memory interpretation, posit that traumatic memories are not triggered by this material, rather, they are suggestively planted by it.

The false memory interpretation assumes a very powerful construct of suggestibility. Given the large number of people who have reported that they recovered in adulthood traumatic memories for events such as sexual abuse that occurred in their childhood, suggestibility would have to be an extremely robust cognitive construct. Before we can adopt the false memory interpretation we need to test if the construct of suggestibility is sufficiently robust to account for this effect.

### The Cognitive Construct of Suggestibility

The large majority of the cognitive research conducted on the suggestibility of memory has employed a three phase procedure modeled after methods used by, for example, Loftus (1975), Loftus, Miller, and Burns (1978), and Pezdek (1977). Using this procedure, participants first view a sequence of slides, a videotape, or a film of an event. After viewing this event, they read a narrative or are asked some questions that intentionally mislead them about the identity of a small set of target items viewed in the original event (the misled condition), or they do not receive the misleading information (the control condition). The major dependent variable in this research is the signal detection measure of $d'$. This measure, $d'$, is an index of the extent to which participants can discriminate between memory for old and new information. The principal result is that participants are more accurate (i.e., higher $d'$ values) recognizing the original target item in the control condition than in the misled condition; that is, they are misled by the postevent information presented in the narrative or questions. But, even in these laboratory experiments, typical differences in the rate of false assents to the suggested item of only 20%-30% have been reported between the misled and control conditions. And in these experiments, subjects were simply misled, for example, to believe that a stop sign was really a yield sign (Loftus et al., 1978) or that a
peripheral male bystander was a female bystander (Pezdek, 1977). In reviewing this work, Lindsay (1993) reported:

At present, we can conclude that under some conditions MPI (misleading postevent information) can impair people’s ability to remember what they witness and can lead them to believe that they witnessed things they did not, but that neither of these effects is as large or robust as earlier research suggested. (p. 89)

Further, there are numerous constraints on the suggestibility of memory, constraints that in fact are related to the occurrence of childhood sexual abuse. Four of these constraints will be discussed here: (a) the familiarity of the original event, (b) whether the original event is consistent or inconsistent with expectations, (c) whether the suggestion is to change a memory or to plant a memory for the initial event, and (d) the plausibility of the suggested false event.

**Suggestively Changing Memory for Familiar versus Unfamiliar Events**

Pezdek and Roe (1995) recently conducted a study to test how vulnerable events are to suggestibility as a function of their familiarity. This issue is relevant to memory for traumatic events such as sexual abuse because perpetrators of sexual abuse often repeatedly abuse a child; sexual abuse is rarely an isolated event. In this study, the typical suggestibility paradigm was used with the modification that in the presentation phase target items were presented either one or two times each. It has been demonstrated in previous studies (cf. Ebbinghaus, 1964, originally published 1885) that the strength of memory increases with the familiarity or frequency of presentation. If stronger memories are more likely to resist suggestibility than weaker memories, then the difference in recognition memory between misled and control test items would be predicted to be greater under less memorable conditions (with frequency one) than under more memorable conditions (with frequency two).

Four- and ten-year-old children viewed a slide sequence in which four target slides were presented one or two times each. The slide sequence presented an individual moving about a house performing a sequence of activities. In a postevent narrative, participants were misled about two target items, and two target items served as controls. In a subsequent recognition memory test, the hypothesis was confirmed. The $d’$ difference between control and misled items was greater for frequency one ($d’ = 3.8$ versus $−2.8$) than for frequency two ($d’ = 5.2$ versus $1.6$); stronger memories were more resistant to suggestibility than weaker memories. This pattern was consistent for both four- and ten-year-old children, indicating that similar cognitive processes underlie suggestibility at each age.
These results suggest that children are significantly more likely to be misled about unfamiliar events than about events that are more familiar to them. Generalizing to the situation of memory for childhood abuse, an event would be familiar if a child had experienced the event or a similar event multiple times. An event would be unfamiliar if it was experienced less often, or perhaps only a single time. Accordingly, if a child reports memory for multiple alleged incidents of having been abused, these memories are less likely to have been suggestively planted than if the child is reporting memory for a single such alleged incident. Of course it would also be important to evaluate the strength of the suggested information in memory relative to the strength of the original information. Zaragoza and Mitchell (1996) for example, reported that repeated exposure to suggestive questions increased adult subjects’ recollection that a suggested event occurred. Accordingly, when a suggestive interview has been repeated numerous times, the strength of the suggested item may exceed that of the original item.

**Suggestively Changing Memory for Events That Are Consistent or Inconsistent with Expectations**

In a number of studies, it has been reported that inconsistent items are more accurately recognized than consistent items. For example, Pezdek, Whetstone, Reynolds, Askari, and Dougherty (1989) introduced adult participants to two real world environments, a graduate student’s office or a preschool classroom. In each setting some of the items were consistent with expectations and some were inconsistent with expectations. Later they were given a recognition memory test in which the distractor items were different exemplars of the original items viewed. This type of recognition memory test assesses whether participants remember the physical appearance of the items viewed. Inconsistent items were recognized significantly more accurately than consistent items. This phenomenon is referred to as the consistency effect. Inconsistent information appears to be encoded into memory with more of the physical details preserved. Consistent information, on the other hand, appears to be encoded more generically with less of the physical details preserved.

If stronger memories are more likely to resist suggestibility than weaker memories, and the physical details of inconsistent events are remembered better than those of consistent events, then memory for inconsistent events should be more resistant to suggestibility than memory for consistent events. This issue is relevant to memory for traumatic events such as sexual abuse because in most home environments, sexual contact between an adult and a child would be inconsistent with children’s expectations. This hypothesis was tested in a Masters Thesis by Taylor (1998).

In this study, participants were shown a slide series depicting a woman
returning home and performing several specific chores. The series included two schema-consistent target items and two schema-inconsistent target items. Participants later read a post event narrative containing two misleading statements and two control statements. Each misleading statement suggested that a different item had been presented in one of the target slides. In each control statement no suggestion was made. A recognition memory test followed in which each distractor picture was identical to the matched target picture presented except that the target item in the picture (e.g., tennis shoe) was replaced by a different exemplar of that item (e.g., running shoe). It was predicted that participants would more likely be misled regarding schema-consistent than schema-inconsistent items.

The results confirmed this hypothesis. The $d'$ data were analyzed using a 2 (consistent versus inconsistent items) × 2 (misled versus control condition) analysis of variance. Both main effects were significant in the predicted direction. In addition, the interaction of consistency with the misled versus control condition was also significant. The $d'$ difference between the control and the misled conditions was greater in the consistent condition ($d' = 2.39$ versus .73) than in the inconsistent condition ($d' = 2.83$ versus 2.39). These findings suggest that participants were indeed more likely to be suggestively misled about schema-consistent information than about schema-inconsistent information. Our interpretation of these results is that inconsistent information is encoded in memory with more of the physical details preserved thus producing a stronger memory trace. Consequently, inconsistent information is less vulnerable to the suggestive influence of misleading information.

These findings have implications for memory for childhood abuse. For a child with no history of inappropriate and abusive contact with an alleged perpetrator, the occurrence of an abusive incident would be inconsistent with expectations. Accordingly, the child’s memory for this inconsistent event would be expected to be more reliable than would be their memory for an event that is more consistent with their expectations of this person.

**Suggestively Changing versus Suggestively Planting Memories**

There is an important difference between the research on the suggestibility of memory using the typical suggestibility paradigm discussed above, and the situation of suggestively planting memories for events that did not occur. In the typical suggestibility paradigm, an item that was observed (e.g., a stop sign) is suggested to be a different and related item (e.g., a yield sign). However, suggestively planting memories involves the situation in which (a) an event never occurred; (b) it is later suggested that the event did occur; and then (c) memory is tested for whether the event occurred or not. There is a significant difference between the structure of these two situations that would restrict the
generalization of the results regarding suggestibility obtained from the first situation (i.e., something happened and it is suggested that a different thing happened) to the second situation (i.e., nothing happened and it is suggested that something did happen).

In a recent study (Pezdek & Roe, 1997), we examined the probability of suggestibility under three conditions:

1. Event A occurred, event B was suggested (the changed memory condition).
2. Event A did not occur, event A was suggested (the planted memory condition).
3. Event A occurred, it was suggested that event A did not occur (the erased memory condition).

These were compared with two control conditions:

4. Event A occurred, nothing was suggested (control condition for experimental conditions 1 and 2).
5. Event A did not occur, nothing was suggested (control condition for experimental condition 3).

The two events, A and B were specific types of physical touches by the experimenter administered while each participant was read directions, a touch on the hand versus the shoulder.

The participants in each experiment were 80 4-year-old children and 80 10-year-old children. The suggestibility effect occurred only in the changed memory condition; the difference between the experimental changed condition ($d' = -.85$) and the corresponding control condition ($d' = .88$) was significant. In the erased memory condition, no suggestibility effect occurred; the $d'$ difference between the experimental group ($d' = .19$) and the corresponding control conditions ($d' = .88$) did not approach significance. Similarly, in the planted memory condition, no suggestibility effect occurred; the $d'$ difference between the experimental group ($d' = .44$) and the corresponding control conditions ($d' = 1.68$) did not approach significance. Thus, although it is relatively easy to suggest to a child a change in an event that was experienced, it is less likely that an event can be planted in or erased from memory. It is thus inappropriate to generalize regarding the probability of suggestively planting false memories based on the typical suggestibility research that has largely been restricted to the study of suggestively changing memories.

So, what evidence is there that events can be suggestively planted in memory? One of the most highly cited study in the psychological literature this decade is the “lost-in-a-shopping-mall study” by Loftus and Pickrell
In this study, 24 volunteers suggested to offspring or younger siblings that they had been lost in a shopping mall when they were about 5 years old. Six of the 24 subjects reported either full or partial memory for the false event. The results of this study are frequently cited to support the claim that false memories can be planted with ease. Similarly, Hyman, Husband, and Billings (1995) asked college students about their memory for numerous true events and two false events. The percentage of subjects who recalled the false events as real was 20% in Experiment 1 and 25% in Experiment 2. Ceci, Huffman, Smith, and Loftus (1996) read preschool children a list of true and false events and asked them to “think real hard about each” event and “try to remember if it really happened.” In the initial session, 44% of the children age 3 to 4 years old and 25% of the children age 5 to 6 years old remembered at least one of the false events, however, with repeated suggestions over seven sessions, there was a significant 7% increase in false assents for older children but an 8% decrease in the incidence of false assents for the younger children. Nonetheless, these studies demonstrate that it is possible to suggestively plant false events in memory.

Suggestively Planting Plausible versus Implausible Events

Although it is clear that some events can be suggestively planted in memory, it is not clear what factors affect the probability of suggestively planting false memories. In a study that we recently conducted (Pezdek, Finger, & Hodge, 1997), we investigated a specific factor that affects the probability of suggestively planting a false event in memory, the plausibility of the event attempting to be suggestively planted. Plausibility is relevant to memory for traumatic events such as sexual abuse because for most children, sexual contact with an adult is undoubtedly an implausible event.

This study tested the hypothesis that events will be suggestively planted to the degree that they are plausible and script-relevant knowledge exists in memory. This hypothesis is derived from the notion that an asserted event must first be evaluated as true before it can be incorporated into autobiographical memory, and if an event is implausible, it is not likely to be evaluated as true. Further, it should be easier to form a memory trace for an event that is plausible and about which one has a well-developed generic script than to form a memory trace for an event that is implausible and about which one does not have a generic script.

In Experiment 1, 22 Jewish and 29 Catholic high school students were read descriptions of three true events and two false events reported to have occurred when they were eight years old. One false event described a Jewish ritual, and one described a Catholic ritual. Results for the false event showed
the predicted asymmetry: Whereas seven Catholics but zero Jews remembered only the Catholic false event, three Jews but only one Catholic remembered only the Jewish false event. Two subjects recalled both events.

Experiment 2 provided an additional test of the hypothesis that events will be suggestively planted in memory to the degree that they are plausible and script-relevant knowledge exists in memory, and specifically tested the generalizability of the results of Loftus and Pickrell (1995). The false event suggested by Loftus and Pickrell was being lost in a shopping mall at about the age of 5. We contend that this event is familiar to most people, and therefore should be relatively easy to plant in memory. Children are often warned about the dangers of getting lost, have fears about getting lost, read classic tales about children who get lost (e.g., Hansel and Gretel, Snow White and the Seven Dwarfs, Pinocchio, Goldilocks and the Three Bears), and often do get lost, if only for a few frightening minutes.

In Experiment 2, each of 20 confederates tested the memory of a younger sibling or close relative (the subject). The mean age of the subjects at the time of this study was 28.5 years. Confederates read descriptions of three events that they reported had happened when the subjects were 5 to 6 years old. Subjects were asked to recall everything they could remember about each event. One event was true; two events were false. One false event, an incident very similar to that used by Loftus and Pickrell (1995), described the subject being lost in a mall while shopping with a parent (the relatively plausible event). The other false event described the subject receiving a rectal enema for constipation (the relatively implausible event). Because much of the research on planting false memories is used to evaluate the probability of planting false memories for childhood sexual abuse, we selected a false event that approaches this experience. This particular false event was suggested because, like sexual abuse, being given a rectal enema is shameful and embarrassing and involves discomfort to a private part of the body. The results are simple: Only three events were falsely remembered; all were the more plausible event regarding being lost in a mall while shopping.

Pezdek and Hodge (1999) replicated the above study with children in two age groups, five to seven years of age and nine to twelve years of age, to see if plausible events were more likely to be suggestively planted with children as well as with adults. The children were read descriptions of two true events and two false events, reported to have occurred when they were four years old. The plausible false event described the child lost in a mall while shopping; the implausible false event described the child receiving a rectal enema. The majority of the 39 children tested (54%) did not remember either false event. However, whereas 14 children recalled the plausible but
not the implausible false event, only one child recalled the implausible but not the plausible false event; this difference was statistically significant. Three additional children (all in the younger age group) recalled both false events.

Together, these two studies indicate that with children as well as adults, false memories are more likely to be planted if they involve events that are relatively plausible. As demonstrated by Pezdek and Hodge (1999) and Pezdek et al. (1997) in Experiment 2, although it may be relatively less effortful to plant a false memory that someone had been lost in a mall when he or she was a child, it is more difficult to plant a false memory in someone that he or she had received a rectal enema as a child. Because the findings of Loftus and Pickrell (1995) are frequently applied to cases involving adults’ memory for childhood sexual abuse (Loftus, 1993), it is especially important to empirically consider the appropriateness of this generalization.

CONCLUSIONS

Several conclusions follow from the experiments presented here. First, surely there have been some false memories for sexual abuse and other traumatic events that have been suggestively planted, whatever their cause. And surely some therapeutic techniques are more likely to support false memories than others. Also, it is surely possible to find some individuals who are so suggestible that it is possible to get them to believe almost anything. But the claim of those who promote the false memory interpretation, that is, that it is relatively easy to plant memories for childhood sexual abuse and other traumatic events that did not occur, assumes an extremely strong construct of suggestibility, one that is just not supported by the data.

The results presented here demonstrate that suggestibility is not an especially robust phenomenon. Yes, researchers have obtained 20-30% reductions in the likelihood that someone thought they saw a yield sign when they had in fact seen a stop sign, but even this probability is substantially reduced with events that are experienced more frequently, with events that are inconsistent with expectations, and with implausible events. Also, although it is relatively easy to suggest that a stop sign was really a yield sign, it is relatively more difficult to plant a memory for an event that did not occur at all, especially if the event is an implausible one. In conclusion, suggestibility does not appear to be a sufficiently strong cognitive construct to explain the delayed recall phenomenon considered here.
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