

## **Increasing Belief in the Experience of an Invasive Procedure That Never Happened: The Role of Plausibility and Schematicity**

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### SUMMARY

Numerous studies have increased people's confidence in the occurrence of various childhood events, however, Pezdek, Finger, and Hodge (1997) were able to successfully increase participants' confidence in one event (e.g., being lost in a mall), but not another (e.g., having received an enema). Two experiments considered two factors, plausibility and schematicity, as explanations for this differential suggestibility. In Experiment 1, participants completed a questionnaire regarding the likelihood of experiencing various childhood events, including receiving an enema. Two weeks later, they were given schematic or plausibility information about enemas, or both, or neither. Finally, participants again completed the previous questionnaire regarding childhood experiences. Only plausibility increased participants' beliefs that they had experienced an enema during childhood. In Experiment 2, participants were additionally asked about whether they had a memory of the event. While participants still responded with greater confidence that they had experienced an enema when given plausibility information, it did not increase their memory for the event, and schematicity actually decreased reported memory for the experience. The potential implications of these findings for the formation of false memories of sexual abuse are considered. Copyright © 2006 John Wiley & Sons, Ltd.

In recent years, memory researchers led by the pioneering efforts of Elizabeth Loftus, have documented the surprising degree to which people can be led to adopt autobiographical experiences that never occurred. For example, using feigned narratives allegedly produced by participants' parents, Loftus and Pickrell (1995) were able to convince approximately 25% of their participants that they had been lost in a shopping mall as a child. Using an imagination procedure, Garry, Manning, Loftus, and Sherman (1996) were able to increase participants' confidence that they had experienced events (such as putting an arm through a glass window) that they previously claimed not to have experienced.

Although numerous researchers have succeeded in increasing people's confidence in the reality of autobiographical events that never actually occurred (e.g., Braun, Ellis, & Loftus, 2002; Hyman & Pentland, 1996), Pezdek, Finger, and Hodge (1997) identified several situations in which it was decidedly more difficult to persuade participants that childhood

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Contract/grant sponsor: Institute of Education Sciences, U.S. Department of Education; contract/grant number: R305H030235.

events had happened. For example, where as Pezdek et al. were able to convince 15% of their participants that they had been lost in a mall, they were unable to persuade any that they had received an enema. Pezdek et al. offered two explanations for why some situations are conducive to false memory generations and others are not. According to a plausibility account, participants reject suggestions that seem inconsistent with their beliefs. According to a schematicity account, however, if a participant lacked 'generic script-relevant knowledge' about the event, they may be less inclined to believe the suggestion.

Other research has shown that increasing both plausibility and schematicity information can increase a subject's confidence that an event happened. For example, Mazzoni, Loftus, and Kirsch (2001) found that by giving participants additional information about the plausibility of witnessing a 'possession,' they were able to increase participants' confidence that they had previously witnessed a possession, as well as their view of how plausible it was. Although Mazzoni et al. interpreted their findings as supporting the role of plausibility in mediating subjects' susceptibility to suggestion, participants were given both plausibility and schematicity information; thus, it is not possible to determine which factor was critical. Additionally, it may have been the combination of factors that was crucial for success.

This is especially important when considering that other research has confirmed that there is a separate effect of plausibility and schematicity (Scoboria, Mazzoni, Kirsch, & Relyea, 2004). They showed that, when considering personally relevant information, plausibility and schematicity were not equally linked to participants' beliefs that they experienced events. Additionally, they showed that there was a strong relationship for participants between believed plausibility that an event happened to them and the belief that they experienced it.

The present research attempted to disentangle the contributions of schematicity and plausibility in mediating changes in people's confidence that they personally experienced a specific childhood event. In the first experiment, participants read false information on how plausible receiving an enema was when they were under the age of 10, schematic information on what the experience of an enema is like, both of these, or neither. The second experiment added a memory aspect to the study, asking participants how well they remembered receiving an enema.

## EXPERIMENT 1

### Method

#### *Participants*

One-hundred twelve University of Pittsburgh students participated in the present experiment for course credit.

#### *Materials and procedure*

Participants filled out a Life Events Inventory (LEI), wherein they indicated on an eight-point Likert scale their confidence that they had previously experienced various events before the age of 10. The target item on the LEI was, 'Received an enema.' The second phase took place at least two weeks following the completion of the initial LEI. They were instructed to read three passages about various medical experiences or diseases. One passage given to all participants was about a teenager's experience with Type I Diabetes.

The second passage detailed schematic information about either what happens when someone has a seizure or what happens when one receives an enema (both true information). The enema schema information detailed how an enema is administered, giving details such as the height of the enema bag, temperature of water, position of body, and timeline of events. The third passage explained plausibility information about either the commonness of chicken pox in children (true information) or the commonness of parents giving their children enemas in the late 1970s–early 1980s (inflated information used to cause participants to believe it was a common practice). These three passages were given in random order to each subject, and each was followed by between five and six questions about the passage the subject just read. These questions were a manipulation check designed to assure that the students had actually read and considered the information. Next, participants completed a filler comprehension test. Finally, they completed the LEI again, and then were debriefed.

## Results

Analyses were conducted on both the direction of change between pre- and post-test results. An analysis of variance (ANOVA) showed no significant differences between groups pre-manipulation,  $F(3, 79) < 1, p > 0.05$ . Pre- and post-manipulation averages and standard deviations are shown in Table 1.

### Direction

Direction of change analyses considered the raw number of participants who, over the course of this experiment, went up, down, or stayed the same in their confidence that they had received an enema before the age of 10.

A 2 (plausibility)  $\times$  2 (procedural) analysis of covariance (ANCOVA) looking at direction of change yielded significant change in direction, such that participants were more likely to increase their confidence in having received an enema, relative to decreasing their confidence,  $F(3, 79) = 2.812, p < 0.05$  (with 24.07% increasing, 7.41% decreasing, and 68.52% staying the same for the group receiving plausibility information and with 8.47% increasing, 18.64% decreasing, and 72.88% staying the same for the group not receiving plausibility information). As is shown in Figure 1, analyses of the individual conditions indicated that this effect was driven exclusively by a main effect of plausibility,  $F(1, 82) = 8.314, p < 0.01$  (with 11.32% increasing, 13.21% decreasing, and 75.47% staying the same for the group receiving schematic information and with 20.00% increasing, 13.33% decreasing, and 66.67% staying the same for the group not receiving schematic information), with no effect for schematicity,  $p > 0.10$ , nor was there an interaction between schematicity and plausibility,  $F(1, 79) < 1, p > 0.10$ .

Table 1. Means (and standard deviations) for pre- and post-manipulation confidence scores

Condition	Experiment 1		Experiment 2	
	LEI-1	LEI-2	LEI-1	LES-2
Plausibility only	2.03 (2.15)	1.48 (1.75)	2.13 (2.22)	2.27 (2.19)
Procedural only	1.65 (1.47)	2.06 (1.91)	1.46 (1.48)	1.56 (1.80)
Both	1.32 (0.48)	1.64 (1.22)	1.36 (0.84)	1.38 (1.12)
Neither	1.96 (1.89)	1.58 (1.12)	2.93 (2.37)	1.67 (1.91)

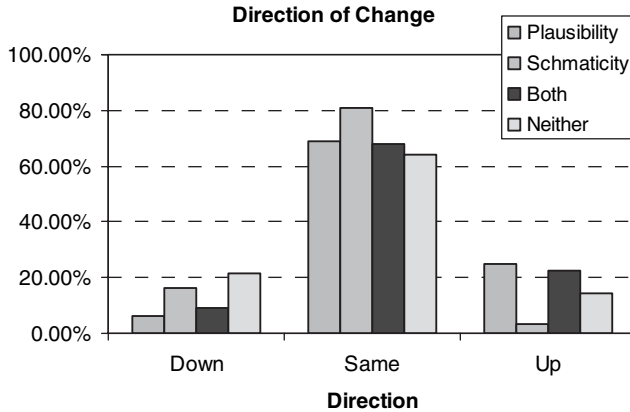


Figure 1. Direction of movement by condition from time 1 to time 2

*Magnitude*

Magnitude of change analyses evaluated the amount that participants’ confidence changed over the course of this experiment. A 2 (plausibility) × 2 (schematicity) ANCOVA examining overall magnitude of change approached significance  $F(3, 108) = 2.648, p < 0.053$ . There was a main effect for plausibility,  $F(1, 111) = 7.311, p < 0.01$  (with mean differences of 0.430 and  $-0.420$  for receiving or not receiving plausibility information, respectively), but again, no effect for schematicity,  $p > 0.10$  (with mean differences of  $-0.085$  and  $0.095$  for receiving or not receiving schematicity, respectively), nor an interaction between schematicity and plausibility,  $F(1, 79) < 1, p > 0.10$ . Those who received plausibility information increased, whereas those who did not receive plausibility information decreased.

**Discussion**

Experiment 1 demonstrated that increasing perceptions of plausibility of enemas can enhance individuals’ beliefs that they personally experienced an enema. Specifically, when participants read inflated information about the plausibility of enemas when they were children, they substantially increased their confidence that they had personally experienced an enema. In contrast, familiarizing participants with the procedure of an enema had no influence on their beliefs about whether they had experienced this procedure. The present findings thus indicated that plausibility provides a critical bottleneck in determining individuals’ susceptibility to suggestions about certain events in their own personal history. Although prior studies have examined the efficacy of combining plausibility and schematicity information (e.g., Pezdek et. al, 1997; Mazzoni et al., 2001), the present study is the first to disentangle these two factors.

Pezdek et al. (1997) suggested that their inability to cause their subjects to falsely recall receiving an enema in childhood may have been due in part to their subjects’ lack of familiarity with the procedure; however, Experiment 1 provides clear evidence that knowledge about enemas may have little to do with participants’ beliefs regarding whether they personally were recipients of enemas. Although providing plausibility information substantially increased participants’ belief that they had received enemas, providing participants with additional information about the nature of this procedure had absolutely

no effect. Thus, although the suggestive procedure used here was different from that of Pezdek et al., the positive effects of the plausibility manipulation in the absence of any effect of schematic information suggest that it was a lack of plausibility, and not familiarity with the procedure, that prevented Pezdek et al.'s subjects from believing that they had received enemas.

## EXPERIMENT 2

Not all determinations that one has experienced an event are based on actual memories of the event. There is a difference between remembering that one has experienced an event by relying on memories, based on reconstructive memory processes, and knowing that one has experienced an event by relying on facts and beliefs, based on constructive memory processes (Grant & Ceci, 2000). Does plausibility information actually cause participants to come to remember receiving enemas, or does it simply set the stage for false memories, by implanting the belief that such an experience occurred? To address this issue, Experiment 2 replicated the basic procedure of Experiment 1 with the inclusion of an additional scale that assessed both participants' belief that an event occurred and also the degree to which they actually recalled the experience.

### Methods

#### *Participants*

Seventy University of Pittsburgh students participated in the present experiment for course credit.

#### *Materials and procedures*

The materials and procedure used in Experiment 2 were similar to those used in Experiment 1, with two notable exceptions. First, after completing the medical information packet, participants read a scientific article designed by the experimenters detailing the commonness of forgetting and then later recovering memories for traumatic medical experiences. Given as examples in the article were such situations as breaking a limb and receiving an enema. Second, instead of completing an LEI at the end of the experiment, participants completed a Life Experiences Scale (LES). The LES was based in part on the Autobiographical Belief and Memory Questionnaire (ABMQ), devised by Mazzoni and colleagues (Scoboria et al., 2004). In the LES, participants rated, among other things, how much of a memory they had of the events (including the target item, receiving an enema before the age of 10 years). These questions were both for the purpose of engaging the participants in thinking about the events as well as a manipulation check to ascertain that those who received plausibility information did indeed see the target item as more plausible for the overall population (Mazzoni et al., 2001). They consisted of the questions, 'How plausible is it that at least some people, before the age of 10, received an enema?', 'Out of 100 people, how many people, before the age of 10, received an enema?', 'How surprised would you be if someone said they knew that you received an enema before the age of 10?', and 'How plausible is it that you personally, before the age of 10, could have received an enema?'.

## Results

An ANOVA on the pre-manipulation results showed no significant differences between groups,  $F(3, 66) < 1$ ,  $p > 0.05$ . Pre- and post-manipulation averages and standard deviations are shown in Table 1.

### *Direction*

Direction of change analyses considered the raw number of participants who, over the course of this experiment, went up, down, or stayed the same in their confidence that they had received an enema before the age of 10.

A 2 (plausibility)  $\times$  2 (procedural) ANCOVA examining direction of change yielded a marginal change in direction, such that participants were more likely to increase their confidence in having received an enema, relative to decreasing their confidence,  $F(3, 66) = 3.149$ ,  $p = 0.082$ . Analyses of the individual conditions indicated that this effect was driven exclusively by the plausibility manipulation,  $F(1, 66) = 3.734$ ,  $p = 0.057$  (with 14.71% increasing, 20.59% decreasing, and 64.71% staying the same for the group receiving plausibility information and with 5.26% increasing, 31.58% decreasing, and 63.16% staying the same for the group not receiving plausibility information), with no effect for procedural manipulation,  $p > 0.10$  (with 8.11% increasing, 21.62% decreasing, and 70.27% staying the same for the group receiving schematic information and with 11.43% increasing, 31.43% decreasing, and 57.14% staying the same for the group not receiving schematic information), nor any interaction,  $p > 0.10$ .

### *Magnitude*

Magnitude of change analyses evaluated the amount that participants' confidence changed over the course of this experiment. A 2 (plausibility)  $\times$  2 (procedural) ANCOVA examining overall magnitude of change yielded significance  $F(3, 66) = 3.149$ ,  $p = 0.031$ . There was a main effect for plausibility,  $F(1, 66) = 7.170$ ,  $p = 0.009$  (with mean differences of 0.035 and  $-0.710$  for receiving or not receiving plausibility information, respectively), but only a marginal effect for schematicity,  $F(1, 66) = 3.101$ ,  $p = 0.083$  (with mean differences of 0.015 and  $-0.690$  for receiving or not receiving schematicity, respectively), and a marginal interaction,  $F(1, 66) = 3.578$ ,  $p > 0.063$ . Those who received plausibility information increased their confidence, whereas those who did not receive plausibility information decreased. Finally, those who received no plausibility and schematicity tended to decrease their confidence the most.

### *Memory of the event*

Interestingly, schematicity had a marginal effect on participants' memories of their experiences,  $F(1, 66) = 3.085$ ,  $p = 0.084$ . As is illustrated in Figure 2, those who received schematic information tended to be less likely to have a memory of the event than those who did not receive schematic information. It is important to note, however, that this was a marginal effect and did not reach the level of significance. There was no effect for plausibility,  $p > 0.10$ , nor an interaction,  $p > 0.10$ .

## Discussion

Experiment 2 replicated the results of the Experiment 1 in showing that participants who received information that receiving enemas at a young age was a plausible experience were

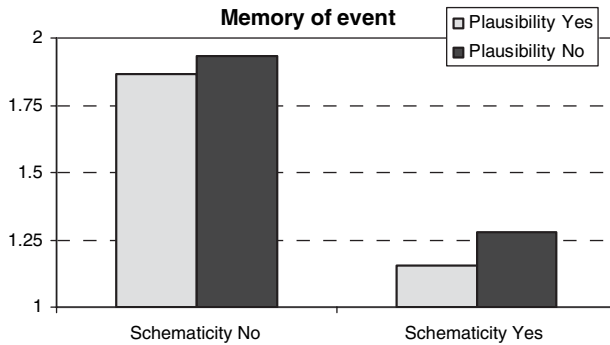


Figure 2. Memory of receiving an enema

more likely to increase their confidence that they received an enema than if they did not receive this information. In addition, the actual mean reported confidence in the occurrence of the experience was significantly greater in those participants who received the plausibility information relative to those who did not.

Interestingly, the plausibility information increased participants' confidence that they had experienced receiving an enema, even though it did not influence their reported memories of the event. Apparently, when participants were considering whether they had experienced receiving an enema, they were not relying on conjuring up a specific memory of the event but rather on more general considerations regarding the likelihood that the event might have taken place. Although plausibility failed to increase people's actual recall of the enema procedure, it is important to note that Hyman, Gilstrap, Decker, and Wilkinson (1998) demonstrated that the belief stage is a frequent precursor to the remember; that is, one may initially only possess a belief in the occurrence of an event, however, over time that experience may actually come to be recalled. Thus, by establishing false beliefs, plausibility information may establish the foundation upon which a false memory can later be established.

As in Experiment 1, receiving schematic information did not increase participants' beliefs that they had actually experienced a childhood enema. Unexpectedly however, the schematic information may have influence their reported memory for the event as participants who received this information were actually marginally *less* likely to report a memory of having received an enema. Although given its marginal nature we should be cautious in interpreting this finding, it seems quite plausible that the schematic information provided participants with a more precise template upon which to assess whether or not they actually possessed a memory. Accordingly, participants in the procedural condition, armed with precise knowledge about what the experience of receiving an enema would be like, might have been clearer of the fact that they possessed no such memory of anything resembling that experience.

## GENERAL DISCUSSION

The present set of studies demonstrated that despite prior failures to increase individuals' belief in the likelihood of receiving a childhood rectal enema (Pezdek et al.), that it is in fact relatively easy to significantly affect people's beliefs in the possibility that they were subjected to this unpleasant and personally invasive procedure. Specifically, in two

experiments it was observed that providing participants with false information about the frequency with which this procedure was given, significantly increased their estimates of the likelihood that they themselves had received one relative to not receiving this information. Whereas in the first experiment it was demonstrated that plausibility information increases confidence that an event happened, the second experiment plausibility information prevented reduction in confidence in the experience that was otherwise observed for participants who did not receive this information.

The story was rather different, however, with respect to the impact of schematicity. In contrast to the view that greater knowledge about an event can increase people's beliefs that they experienced that event, very little evidence was found that providing details regarding the nature of the procedure enhanced people's beliefs that they had experienced it. Indeed, receiving schematic information actually decreased participants' estimates of the degree to which they recalled having received an enema.

It is, however, important to consider a relevant caveat regarding the schematicity manipulation. Research has not assessed the commonness of knowledge of what happens when people experience enemas. While it is not likely that all participants began with complete knowledge of what an enema entails, it is possible that some participants began with this knowledge. It is essential to consider this possibility in future research, as well as assessing participants' overall beliefs of the commonness of enemas.

In recent years, some have argued that Pezdek et al.'s inability to induce false memories of a childhood enema procedure speaks to the difficulty of implanting memories of childhood sexual abuse (e.g., Pezdek & Eddy, 2001). The basic argument is that sexual abuse is much more like receiving an enema, than it is like being lost in the mall, and therefore, difficulties in planting memories for enemas suggests that research on false memories for more mundane experiences may have little bearing on the possibility of planting memories for sexual abuse. The present research, however, indicates that it may not actually be so difficult to increase people's beliefs that they personally received an enema. If, as prior authors have argued, the experience of receiving a rectal enema provides a closer approximation of the experience of sexual abuse than do the more mundane experiences used in previous studies, then the finding that plausibility information considerably increases people's beliefs that they have personally experienced this procedure must also be considered especially relevant. Accordingly, this research suggests that increasing people's beliefs in the simple information about the plausibility of other disturbing experiences, such as a therapist suggesting that a client could have been a victim of sexual abuse, could influence a person's perception of the plausibility of that experience.

Although plausibility information was effective in increasing participants' belief that they had personally experienced an enema, it is notable that providing individuals with information about the details of the procedure failed to influence people's beliefs about whether they might have experienced this procedure. In the past, it has been suggested that individuals use their absence of knowledge about an event (such as receiving a childhood enema) as one way of ruling out having personally experienced (e.g., Pezdek & Eddy, 2001). Moreover the success of other studies that have effectively planted false beliefs about unpleasant childhood events (e.g., witnessing a possession) could in principle have been explained by virtue of the additional knowledge about those events that the experimenters provided (Mazzoni, et al., 2001). However, the present study, which is the first to systematically disentangle the relative contributions of plausibility and schematicity, clearly demonstrates that plausibility can alter childhood beliefs even when increased knowledge about the experience has no effect.



## ACKNOWLEDGEMENTS

This research was supported by a Cognition and Student Learning Research Grant from the Institute of Education Sciences, U.S. Department of Education (Grant R305H030235). We are grateful to Jamie Spanik and Heather Livingstone for help in data collection, as well as Maryanne Garry and an anonymous reviewer for comments on earlier drafts of this manuscript.

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