22. Memory Modification and the Role of the Media

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Introduction

Several years ago, two Filipino nurses, Filipina Narciso and Leonora Perez, were convicted of poisoning nine patients, two of whom died, at the Veterans Administration Hospital in Ann Arbor, Michigan (Jones, 1977). There was little doubt that a muscle-paralyzing drug called Pavulon had been injected into the victims causing instant suffocation, but the Federal Bureau of Investigation had difficulty finding evidence that would link anyone to crime. Surviving victims and staff members were hypnotized to "refresh" their memories. Early on, one witness under hypnosis remembered two different nurses as being in his room, but well before his attack. After the Filipino nurses became suspects and their pictures were in the newspapers and on television, two witnesses became certain that they had seen Filipino nurses in or near the rooms of their loved ones near the time that their breathing stopped. Did the media coverage refresh the witnesses' memories, or did it change their memories? Although we cannot be sure what happened in this case, it is of some interest that the trial judge, sufficiently troubled by the jury's guilty verdict, ordered a new trial for the nurses, and the prosecution decided not to retry the case.

The case of the Filipino nurses presents the opportunity to question the extent to which the media can influence the recollections of witnesses to past events. Such a notion should not seem anomalous at all. For example, the idea that memory is subject to deliberate and systematic distortion occurred to Martin Cruz Smith, author of the novel *Gorky Park*. In his book Smith asked, "What good is a witness? Their memories are indistinct after a day. After three months, frankly, I could get them to recognize anyone I wanted to." Before we explore this issue and place it in perspective, note that we are primarily discussing episodic memory, which "receives and stores information about temporally dated episodes or events, and temporal-spatial relations among these events" (Tulving, 1972, p. 385). We will, however, also discuss semantic memory, which receives and stores knowledge of general, factual knowledge.

In this paper, we raise issues related to the general topic of media influences on memory, a topic we refer to as the media/memory relationship. Next we discuss some ways in which memory for past events can become distorted by new inputs and report an experiment designed to treat this hypothesis. Finally, we consider the media itself as a potential vehicle for memory distortion.

Media and Memory

The media can potentially affect human memory in a number of significant ways. It has been amply demonstrated that portrayals in the media can influence people's knowledge and attitudes

about such topics as crime (Gerbner & Gross, 1976), the elderly, and the role of women in our society (Gerbner, Gross, Elery, & Jackson-Beeck, 1977; Gerbner, Gross, Morgan, & Signorielli, 1980). Can the media influence episodic memory?

Some research has shown that people have fairly poor memories for episodic information received via the media (Bekerian & Baddeley, 1980; Wagenaar, 1978). A few years ago when a new international agreement among European radio stations required the British Broadcasting Corporation (BBC) to reassign some of the British radio wavelengths, the BBC embarked on a saturation advertising campaign to familiarize its radio audience with the changes. For 2 months, radio listeners found their favorite programs repeatedly interrupted by detailed information on the new wavelengths. Slogans and jingles were used to stamp the information into memory, and many listeners heard the campaign over a thousand times. However, when researchers studies its impact (Bekerian & Baddeley, 1980), they found that listeners' memories for the details of the new wavelengths were "appalling" (Baddeley, 1982, p. 31). Although they were well aware that a change was imminent, and many knew the date of that change, most listeners were unable to recall the numerical wavelength, and were much less easily able to locate their station on a radio dial when asked to. This study illustrates that mere repetition of information does not ensure that it is well remembered. What is important is how that information is processed.

Even though we can find instances where something that is experienced a thousand times has little effect on memory, a converse fact is also true: an event that we experience only once can have a profound effect on memory. Based upon a body of research on memory distortion, it seems plausible that some information presented by the media - even though experienced only once - could still have an impact on people's memories for their own past experiences. In the next section, we briefly review this memory distortion research and examine some of its implications regarding the media/memory relationship.

Memory for Past Experience

Memory Malleability

One characteristic of episodic memory suggested by Tulving (1972, 1983) is its greater relative vulnerability. The extraordinary malleability of memory has been recently demonstrated in our laboratory (Loftus, 1979, 1983). consider a typical experiment in which college students were presented with a film of an automobile accident and immediately afterward asked a series of questions about the accident. Some of the questions were designed to present misleading information (e.g., to suggest the existence of an object that did not in fact exist). Half the subjects were asked, "How fast was the white sports Datsun going when it passed the barn while traveling along the country road?" In fact, no barn existed. The remaining subjects were asked, "How fast was the white sports Datsun going while traveling along the country road?" Later all subjects were asked if they had seen a barn. When questioned again about the accident 1 week later, more then 17 % of those exposed to the false information said they had seen a barn. Apparently when subjects were led to assume the existence of a barn during their initial questioning, many of them incorporated the nonexistent barn into their recollections of the event. Moreover, a subsequent experiment showed that simply asking people whether they had or had not seen a

barn - a question to which they usually answered "no" - was enough to increase the likelihood that they would later instate a barn into their memories of the accident. We argued that the false information had become integrated into the subjects' recollections of the event, supplementing their original memories of that event.

Yet, new information can do more than simply supplement a memory: it can apparently alter or transform the memory. In another study (Loftus, Miller, & Burns, 1978), subjects saw a series of slides depicting successive stages of an accident involving an automobile and a pedestrian. A red car was traveling along a side street toward an intersection at which there was a stop sign for half the subjects and a yield sign for the remaining subjects. For all students, the remaining slides showed the car turning right and knocking down a pedestrian crossing the street.

Immediately after viewing the slides, the subjects answered a number of questions, one of which presupposed the existence of either a stop sign or a yield sign. When the critical question asked earlier had presupposed a traffic sign consistent with what the subjects had actually seen, they chose the correct sign 75 % of the time; when the earlier question presupposed an inconsistent traffic sign, however, subjects chose the correct slide only 41 % of the time. This experiment suggests that presuppositions are capable of transforming memory as well as merely supplementing it.

Memory can, in fact, be moulded by so subtle an instrument as a strong verb. In another study, subjects were shown films of automobile accidents and then were asked questions about events in the films. Subjects estimated a higher speed when asked how fast the cars were going when they *smashed* into each other than they did when the verb "smashed" was replaced with the verbs "collided," "bumped," "contacted," or "hit". When tested a week later, those subjects who had been given the verb "smashed" (rather than "hit") were more likely to answer they had seen broken glass in the film, even though broken glass was not present. By using the word "smashed," the experimenter supplied a rather extreme description, and thus the subjects had a memory representation of an accident that was more severe than it was in fact. As a result, subjects were more likely to "remember" that broken glass existed because broken glass is associated with a severe accident.

These experiments, along with many others using similar procedures, suggest the elasticity of memory. False information can *supplement* the previously acquired memory (as in the experiment with the barn), or *transform* it (as in the experiments with the stop sign/yield sign and the broken glass.

Boundary Conditions for Memory Malleability

The alteration of recollection appears to be a fact of life. It is of theoretical and practical interest to know under what conditions people accept or resist suggestive information, and which of those conditions encourage or minimize distortion in the recollection of information. A number of separate lines of research help to delimit the boundary conditions for the *recollection change phenomenon*, a term meaning that memory is conducive to recollection change as memory fades (see Hall, Loftus, & Tousignant, 1984). One line of research concerns the delay intervals

between viewing an initial event encountering subsequent misinformation, and engaging in a final test of recollection. People are more influenced by misinformation when longer intervals of time occur after events. Another line of research concerns the presence or absence of warnings. When warned about the possibility of receiving misinformation, people are better able to resist it. Apparently the warning motivates people to scrutinize the misinformation, which leads to the greater likelihood of their detecting and then resisting the misinformation. These different research pursuits on memory distortion are linked by a shared principle known as *discrepancy detection*, the detection of a conflict between the original memory and post-event information occurring when the post-event information is processed. A change in memory of an event is more likely to occur if discrepancies between the original event and the post-event misinformation are not immediately detected.

If we are correct about the important role that discrepancy detection plays in the acceptance of post-event information, we might predict that subjects who, on their own accord, read the post-event information slowly would be more resistant to that information than subjects who read it quickly.

Data bearing on this hypothesis can be found in Tousignant, Hall, and Loftus (1986). The first experiment in this series involved three major phases. First, subjects viewed a set of slides depicting a purse snatching. After viewing the slides, subjects were exposed to some post-event information and later tested for memory of the original event.

The post-event information was presented via a narrative that subjects read from a computer screen, containing misinformation for half the subjects. Misled subjects read that the victim walked under an overhanging restaurant sign although the actual sign was for a tavern. These subjects also read that the victim's friend had short, curly black hair although her hair was actually red. All subjects read the sentences in the narrative one at a time and pressed a button when they wished the next sentence to appear. Each of their reading times were recorded.

When subjects were tested, those who were exposed to misleading information made more errors, which was expected. Of major interest to the present discussion, however, is the analysis comparing the misinformed subjects who resisted the misinformation with the misinformed subjects who accepted the misinformation. Subjects who read the post-event narrative more slowly tended to be more resistant to the post-event misinformation. "Accurate" subjects took an average of 10.1 s per sentence to read the narrative, whereas "highly suggestible" subjects took an average of 7.6 s.

In similar experiments, half the subjects were instructed in how fast to read post-event information. Subjects who naturally read more slowly were more likely to detect a discrepancy between what they were reading and what they had stored in their memory. Likewise, subjects instructed to read slowly were more likely to detect a discrepancy than those instructed to read quickly. Results of our experiments suggest that longer reading times are associated with a greater scrutiny of post-event information. This leads to an increased likelihood that discrepancies will be detected and that the misinformation will be resisted.

Other boundary conditions for the misinformation effect have been empirically demonstrated. People have been shown to reject misinformation that is highly implausible and to reject

misinformation - and correct information - presented by an apparently biased source. This evidence raises questions regarding whether people would be influenced by misinformation obtained from the media, and whether they would be differentially influenced depending on the degree of respect they have for the medium or for the journalist presenting the information.

The Fate of Memory

Our experiments have shown that a person's recollection can be altered by exposure to new information - there is still a question of why? Why is post-event information remembered instead of original, factual information? What happened to the actual information? Two hypotheses offering explanations are discussed below.

The *coexistence hypothesis* assumes that both original and post-event information exist in memory together. However, the introduction of post-event information is thought to cover up the original memories. Nevertheless, the original information is still potentially recoverable, only less accessible (Morton, Hammersley, & Bekerin, 1985). The *alteration hypothesis* suggests that original memory becomes altered as post-event information is processed. Consequently, the original information is irretrievable.

Determining which of the two hypotheses accurately describes what occurs in memory has enormous practical importance, since each bears heavily on attempts to correct a memory after it has been biased or fed misinformation. Under the coexistence view, retrieval techniques such as hypothesis or context reinstatement might access the original information. Under the alteration view, however, the only retrieval technique possible would be the realteration of memory.

The coexistence versus alteration distinction also has theoretical importance. The coexistence view is consistent with the idea that all information, once stored, remains in memory more or less permanently. The alteration view implies a true loss due to updating, substitution, or blending of new inputs.

Finally, it has been suggested that both of these positions are wrong: post-event information has no effect on memory at all (McCloskey & Zaragoza, 1985). According to this theoretical interpretation, post-event information influences only what people report, not their underlying memory traces. However, as has been shown, post-event information, under certain circumstances, can have a profound effect on what people say about their past, which is apparently incontrovertable, despite the theoretical dispute over the recoverability of original, underlying memory traces.

On the issue of the fate of memory, Loftus, Schooler, and Wagenaar (1985) have argued that it is probably fruitless to continue asking whether the pristine, original memory exists regarding specific events. Memories do not seem to be neat photographs containing only the original or only the new misleading information. Instead they may be more like montages containing original and new features blended holistically. Further research should answer the question of how the two sources of information - original and new - interact and evolve with one another.

Malleability and the Media

The Generalizability Issue

In psychological studies, post-event information is typically presented in the form of leading questions or a narrative ostensibly produced by another witness. However, it has been suggested (Loftus, 1979) that post-event information may come in a variety of forms - from conversations, newspaper stories, and so forth - all of which can have analogous influence. This suggestion is, of course, conjecture.

Simply because subjects in controlled psychological experiments are influenced by leading questions or the versions of others regarding an experimental event does not prove that real witnesses to live events have their memories transformed or distorted by post-event information more generally, or by media accounts more specifically. This is the generalizability issue.

A variety of studies conducted at the University of Washington for the past 10 years has demonstrated that real witnesses to live events can have their memories distorted. Students in undergraduate psychology courses have been trying to create memories for "live" witnesses for events that did not actually exist. These students have discovered how relatively easily creating memories can be accomplished. Indeed, a created memory can be as real as a memory resulting from ordinary perceptual sensations.

One group of students conducted their study in a train station. In this study, two female students entered the station, and one of them left her large bag on a bench. Afterward, both women walked away. While they were gone, a male student lurked over near the bag, reached in, and pretended to pull out an object and stuff it under his coat. He then walked away quickly. When the women returned, the woman who left the bag began to cry, "Oh my God, my tape recorder is missing!" She lamented that her boss had allowed her to take it home, that it was very expensive, and bemoaned the fact that she might lose her job. The two women then talked to nearby eyewitnesses. Most were extremely cooperative in offering sympathy and information. The "victim" asked for their phone numbers, and most witnesses complied.

One week later a student pretending to be an insurance agent called the witnesses as part of a "routine investigation of the theft." All were asked for details; and finally they were asked if they had seen the tape recorder. Although there was no tape recorder, about half of the witnesses "remembered" seeing it. When pressed for a description of what they saw, some said it was black, and others said gray. Some even said he tape recorder was in a case. Their descriptions indicated a rather vivid "memory" for a tape recorder that never was!

A Media Demonstration

In response to the classroom assignment, one student coincidentally conducted a "media" demonstration (Yagle, 1981). The memory he hoped to alter concerned a scene from a film released several years earlier, "The Man Who Fell to Earth" directed by Nicholas Roeg. In the scene, the star of the film, David Bowie, is driving a black limousine along a country road

through some uninhabited backwoods. Suddenly, off to the side in a clearing, a group of early American settlers appear, who yell and point at the strange apparition of an automobile, and then vanish. The entire incident lasts approximately 10 s, and the scene is quite memorable.

Yagle, a reporter for the student newspaper, attempted to change the memories of persons who had seen this film. In his review of "Bad Timing," another film directed by Roeg, Yagle referred to the limousine scene in the "The Man Who Fell to Earth," and erroneously described the limousine as white.

In order to discover the effects of his misleading reference, Yagle hoped to interview two groups of subjects - those who had read his review and those who had not. To his dismay, Yagle found very few people who had seen the film, remembered the scene, and also read his review. Of the persons he interviewed, however, those who had not read the review remembered the limousine correctly as black. On the other hand, half of those who had read the review recalled that the limousine was white.

Media and Eyewitness Memory

It has long been suspected that the media can produce pretrial publicity, especially in sensational cases, that could bias potential jurors, and thereby deny the defendant the constitutional right to a fair trial by an impartial jury (Salas, 1984). There is yet another way in which the media may impact parties in litigation. For many events that the media portray, there are multiple witnesses (e.g., collapse of Hyatt Hotel, Kansas City; Bob's Big Boy massacre, Los Angeles; attempted assassination of President Ronald Reagan, Washington, D.C.; space shuttle explosion, Cape Canaveral). Often the media give details of an interview with one or more of these witnesses, and other witnesses or potential witnesses are thus exposed to these details. It seems reasonable to assume that later witnesses might have had their memories biased or contaminated by earlier accounts. These later witnesses may then testify in court about what they "remembered."

There are numerous reasons to suspect that post-event information provided by the mass media will influence memory to at least as great an extent as post-event information provided in experimental contexts. In experimental contexts, because post-event information has a greater impact if introduced after memory has faded, we have allowed memory to fade and, even after less than 1 hour, have seen significant contamination due to post-event information. After exposure to natural, highly newsworthy events, a person's memory may have many hours to fade before exposure to post-event information.

Vividness is another reason that media-presented post-event information might be especially potent. According to Nisbett and Ross (1980), a stimulus is vivid to the extent that it is "(a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal or spatial way" (p. 45). Vivid information is thought to be more persuasive than pallid information of equal or greater validity in part because it comes to mind more easily (Tversky & Kahneman, 1973). Although there is some question about the empirical evidence for special power of vivid stimuli (Taylor & Thompson, 1982), there seems to be agreement that individual case histories, often quite vivid, persuade more effectively than do group statistics, often dry and

pallid (Fiske & Taylor, 1984). Thus, if a potential witness sees a witness on television talk about what he or she saw, this might be especially compelling in terms of the ability of the television account to distort the potential witness's memory.

The Media and Misinformation: An Experiment

We were interested in whether post-event information presented via media accounts can influence the memory of people who have actually witnessed an event. If media-presented information influences witness memory, we would expect that subjects exposed to a television report, for example, would remember the critical details of an original event less accurately than subjects who were not so exposed. Our preliminary work, designed to establish a paradigm to test the effects of misleading information presented by the mass media, was explored in a three-part experiment.

The Event. In this study, subjects viewed a 4 min videotape of a robbery and shooting incident used to train police officers (Geiselman, Fisher, MacKinnon, & Holland, 1985). The videotape depicts two police officers on rounds at night. One police officer talks to several people as he walks and often gives his partner information about the area. Suddenly, they hear shots and screams and see people rushing from a liquor store the officers had just passed. One suspect is immediately gunned down and is found by police officers who arrive later. Meanwhile, the two police officers chase the second robber and eventually find him in a trash container. The robber announces he is hit and asks the police officers not to shoot him, but the robber pulls out a gun and wounds one of them. His partner shoots the robber, wounding him.

The Misinformation. After a 10 min filler task following the viewing of the videotape, the second phase of the experiment occurred. Approximately half the subjects (the misled group) were exposed to misinformation presented as a 4 min television report of the incident. Subjects who watched this report were exposed to four items of misinformation (see Table 1). For example, they heard the reporter refer to the liquor store as Midtown Liquor Store when it was actually Pete's Liquor Store. They heard the reporter claim that the robber shouted from the container, "Don't shoot. I don't want to die." In the film, the robber had only said, "Don't shoot." In addition, misled subjects watched the television report under a pretext: they were led to believe

Table 1. Critical items: original event information versus misinformation

	Information presented in the original event	Information suggested in the television report
Item 1	Two robbers	Three robbers
Item 2	Car	Truck
Item 3	Pete's Liquor Store	Midtown Liquor Store
Item 4	"I'm hit. Don't shoot."	"Don't shoot. I don't want to die."

that they would have to decide whether the reporter was sufficiently talented to obtain a job in a major national news operation. The remaining subjects received no post-event information (control group). Instead of watching the television report, they continued to work on the filler task for an additional 4 min.

The Test. All subjects were asked to answer a series of questions based on their own personal memory of the robbery. Of the 17 questions on the test, four questions contained details based on the erroneous information given to the misled subjects; however, 13 of the questions were based solely on the film. Thus, subjects should perform comparably on these questions.

Results. The percentage of subjects in the misled and control conditions who gave the correct response, the suggested response, or some other response is shown in Table 2, and are collapsed across the four critical items. The pattern of data is in the predicted direction. Control subjects were more likely to pick the correct response than subjects who viewed the television report containing misinformation. On noncritical items (i.e., those items for which no misinformation was presented), there was no difference in accuracy for the experimental (93.2 %) and control (93.6 %) groups.

Collapsing across the four critical items, however, obscures the fact that there are significant item differences. Although misled subjects were less accurate than controls on all four critical items, misled subjects were strongly influenced by only two of the four pieces of misinformation. As seen in Table 3, which reports the percentage of correct responses, suggested responses, or other responses separately for each of the four critical items, the misled subjects remembered the name of the liquor store as Midtown Liquors, rather than Pete's. This resulted in poor performance in the misled condition compared to the controls (33 % versus 86 % correct).

Moreover, many misled subjects were influenced to believe they had heard the robber say, "I don't want to die" (37 % given suggested response versus none of control subjects). However, misled subjects were not influenced to believe there were three robbers instead o the actual two. Moreover, having been told in the television report that the vehicle behind which a robber had was a truck, not a car as in the film, did not seem to influence the misled subjects' memory.

We can only speculate about why certain items of misinformation had a strong impact whereas others did not. For all four critical items, the control group performed reasonably well

Table 2. Response to the critical items by the misled and control group

	Experimental group (n = 27) (%)	Control group (n = 22) (%)
Correct	62.03	87.49
Suggested answer	27.78	1.13
Other incorrect answer	10.18	11.35

Table 3. Response to each of the four critical items for misled and control subjects

	Experimental group (n = 27) (%)	Control group (n = 22) (%)
Correct		
Robbers	85.19	95.46
Vehicle	66.67	77.27
Liquor Store	3.33	86.36
Utterance	62.96	90.90
Suggested answer		
Robbers	11.11	00.00
Vehicle	3.70	00.00
Liquor Store	59.25	4.54
Utterance	37.04	00.00
Other errors		
Robbers	3.70	4.54
Vehicle	29.63	22.73
Liquor Store	7.42	9.10
Utterance	00.00	9.10

(77 %-95 % correct). It is unlikely that the performance of the control group determines whether misinformation will have a greater or lesser influence. For all four critical items, the suggested response was rarely given by control subjects (e.g., < 5 % of the time and for only one item). Therefore, the suggested response cannot influence memory except when it is so plausible that control subjects would have some tendency to also choose it.

The strongest misinformation effect occurred on the item referring to the name of the liquor store. Although the name was printed, somewhat obscurely, on the front of the store, one police officer also mentioned the name to his partner. This enabled control subjects to perform well. However, the television reporter mentioned the erroneous name twice, possibly ensuring that it was strongly encoded by viewers. This post-hoc analysis of why this single item worked so well is not particularly satisfying because post-event information can have a large impact, even when it is presented only once.

In addition to sorting out the item effects, there are a number of interesting issues which this type of research can address. Are people more readily influenced when the information comes from television or a newspaper? Because television presents information more vividly, a reasonable hypothesis predicts that a potential subject-witness would be more influenced by seeing a witness interviewed on television than by reading that interview in a newspaper. Vivid information has been shown to have a considerable impact on memory. Support for the superior power of vivid information comes from several sources, most notably Nisbett and Ross (1980), who have termed this power the *vividness criterion.*

Nisbett and Ross argue that vividly presented information has greater impact on judgments than "pallid and abstract propositions of substantially greater probative and evidentiary value" (1980, p. 44). At the time they made their argument, however, evidence for vividness was based mostly on anecdotes rather than on empirical research. To say with any confidence that television has more distorting power than print requires evidence from specific and focused research. Whether television print is more capable of distorting memory could depend on the nature of the post-event message. Indirectly related persuasion research has shown that a vivid presentation of a long or difficult message produced longer recall (Chaiken & Eagly, 1976; Wilson, 1974).

It would also be of interest to determine whether preexisting attitudes about the reliability of media reports affect the extent to which people's memories are contaminated by media-presented information. We could find that witnesses allow their memories to become contaminated only if they hold the media in high regard. According to a Newsweek poll (October 22, 1984, p. 68), 8 % of those polled believed that very little of what is read or heard in the news media can be believed, whereas 39 % claimed that most media-presented information can be believed. These two groups could be expected to be differentially influenced by media-presented misinformation.

Although no empirical research exists, it is reasonable to suppose that the various elements of the news media would be more or less able to distort memory. Elements that are held in high regard generally might be more influential. In the Newsweek poll cited earlier, over 80 % of respondents believed that television news is generally accurate, 77 % believed that radio news is generally accurate, 73 % believed that their local newspaper is generally accurate, and 29 % believed that the supermarket tabloids are generally accurate. A question for further research would be whether these beliefs translate into differential influence for television, radio, local newspapers, and tabloids.

Other Media Applications

Media and Flashbulb Memories

The memories of circumstances in which very surprising or consequential events are learned have been termed *flashbulb memories* (Brown & Kulik, 1977). The main ingredient for flashbulb memories seems to be a very high level of surprise, often accompanied by emotional arousal. The prototypical example of this is the memories created by the news on November 23, 1963: the day President Kennedy was assassinated. The Kennedy assassination created an extraordinarily powerful and widely shared flashbulb memory. In 1983, some 20 years after the assassination, empirical data were published suggesting that virtually every young adult who was 8 years of age and older in 1963 could recall something about his or her circumstances when they learned of Kennedy's assassination (Winograd & Killinger, 1983). Interestingly, people also recalled flashbulb memories 33 years after the assassination of Lincoln (Colegrove, 1982).

The Kennedy and Lincoln assassinations are not the only events that have created flashbulb memories. Other highly newsworthy events, as well as personally significant events, also create flashbulb memories. In 1986, memory researchers quietly talked about how the explosion of the

space shuttle "Columbia" might become the new flashbulb memory, especially for Americans. One journalist echoed these feelings when he said, "We will all be able to say, all our days, where we were, what we were doing, what we thought and felt as we heard the radio or watched, again and again and again, that awesome and awful footage from 11:39 a.m. EST... Never had tragedy been so easy to see" (Champlin, 1986, p. 5G).

Because it suggests surprise and brevity, flashbulb memory is a reasonably good term for the phenomenon, but it is not perfect. A photograph taken with a flashbulb preserves everything within its scope; flashbulb memories do not. Their specialness has been seriously questioned (Rubin & Kozin, 1984), as well as their accuracy (Neisser, 1982). After all, even when people describe their flashbulb memories of highly newsworthy events, for example, are they remembering their actual experiences based on intact, original memories, or are they simply repeating memories *rehearsed* and embellished since the event?

The important role of rehearsal in producing flashbulb memories has been stressed by numerous researchers (e.g., Brown and Kulik, 1977; Neisser, 1982), although for different reasons. Some researchers (e.g., Brown & Kulik, 1977) believe that a flashbulb memory is established at the time an event occurs; rehearsal serves to maintain and elaborate the initially vivid memory. Other researchers believe that flashbulb memories are created after an event occurs; significance is attached to them later via rehearsal. Winograd and Killinger (1983) question whether a core memory persists through time or whether memory is continually updated and recorded. Both views of the process, however, predict a high correlation between reported rehearsals and the degree of elaboration found in the reports of flashbulb memories.

The mass media, then, may play a special role in creating flashbulb memories by presenting highly newsworthy events over and over again. Many people heard about the space shuttle explosion on the radio, watched it on television, read about it in local and national newspapers, and read about it yet again in weekly news magazines. What effect does this saturation of news have? The journalist quoted earlier also remarked about the power and responsibility of television (Champlin, 1986, p. 5G):

> Never had tragedy been so easy to see. The images of the launch, the widening plume a billowy white against the beautiful, cold, blue and cloudless sky, had never been so clear and perfect. Catastrophe - the firebrand pieces spraying into space - had never been so vivid, never seemed so much like cruel echoes of Hollywood special-effects detonations.

Our experiences with media may be a critical aspect of the establishment or maintenance of flashbulb memories of the space shuttle explosion or other vivid events. When experiences are widely shared through the mass media, the nature of the memories created by those experiences may actually be qualitatively affected. Our shared media environment has the potential for shaping our personal as well as our collective memories because what we remember is in large measure connected with what we rehearse, and the media can influence our memories by influencing what and how often we rehearse.

Media and Personal Experiences

There is another potential media influence on personal memories. This concerns the extent to which people might become confused, and "remember" events that were experienced via the mass media as though they happened to themselves. Could someone watch an explosion, a robbery, or an assassination on television and later come to believe he or she was actually present when the event occurred? This may sound far fetched - but not to some researchers. Media presentations influence semantic memory in general, and estimates of victimization and violent crime (Gerbner et al., 1977, 1980) more particularly. Doob and MacDonald (1979), however, question whether this causal relationship exists. If this is so, can television influence an individual's recollections of his or her own victimizations? Could people see a news report of a crime and much later think that that crime or a similar one happened to them? This is unlikely. There are reasons to be optimistic that news media reports do not influence personal recollections.

Some recent research shows that media impact occurs with societal level judgments about general problem importance or frequency but not with judgments about personal risk (Tyler & Cook, 1984). Based on this research, the news media does not influence personal recollections. On the other hand, media exposure to crime may influence those recollections in a number of ways. Recent theoretical research has shown that people occasionally confuse the memory of actually doing something with the memory of only imagining it (Johnson & Raye, 1981; Anderson, 1984), or the memory of actually seeing something with the memory of thinking about it. Given the pervasiveness of these types of errors, conceivably individuals could watch an event on television and recall it as something they really experienced.

The Media and One Man's Memory

The prospect that the media can affect memory sheds new light on one particular memory; namely, the memory of John Dean. Recall that Dean was former counsel to President Richard Nixon during the Watergate break-in. In June, 1973, Dean testified before a committee of the United States Senate, and he began his testimony with a 245-page statement describing dozens of meetings that he had attended with various other persons on Nixon's staff over the previous several years (Neisser, 1981, 1982). Because Dean's memory was so detailed, several Senators disbelieved Dean's testimony. One asked Dean, "Have you always had a facility for recalling the details of conversations which took place many months ago?" The Senator was especially impressed that Dean had done this without the benefit of notes or a daily diary.

Dean said he kept a newspaper clipping file from the date of the first Washington Post article until the time of the Senate hearings. He said he triggered his recollection by reading every single newspaper article, outlining what had happened, and then placing himself in the described scene.

Did the articles trigger his recollection, as Dean claimed, or did they partially supplement or distort his memory? Dean was unaware that all conversations in Nixon's Oval Office were

secretly recorded. A psychologist, who made an extensive comparison of those tapes with Dean's senate testimonies, concluded that Dean was entirely wrong about the course of many conversations, but nevertheless recounted the facts of those conversations (Neisser, 1981, 1982). Yet, it is difficult to ascertain whether Dean truly remembered those facts or whether he reinstated those facts into his memory from his perusal of newspaper clippings.

A French writer, Maurice Halbwachs (1980), anticipated many of the ideas presented herein, and he may have not been surprised to find a blend of truth and fiction in John Dean's recollection. He talked about what happens when several people witness or participate in an episode and later one of them evokes the events for another. Very often, Halbwachs claimed, others can change the impression, or image, that we have kept of some distant fact.

> It might be that such images reproduce the past inaccurately, while that element or fragment of remembrance already in our mind is a more accurate expression: in this case a solid fund of fictitious remembrances is added to real remembrances. Conversely, it is possible that only the testimony of others is accurate and that they rectify and re-establish our remembrances in the process of being incorporated into it. In both cases these images blend into our remembrances and seemingly lend them their own substance... Just as we must introduce a small particle into a saturated medium to get crystallization, so must we introduce a "seed" of memory into that body of testimony external to us in order for it to turn into a solid mass of remembrances (p. 25).

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23. Response to Suggestions of Memory Distortion in Hypnosis: Sampling Cognitive and Social Factors

P.W. SHEEHAN

Introduction

The operation of memory processes in hypnosis is an important component of the study of suggestion and suggestibility. Not surprisingly, perhaps, the theoretical options are diverse. Sharp debate exists in the literature concerning whether hypnosis enhances memory accuracy or contributes actively toward distortion, and many theoretical processes are proposed as relevant to the arguments. Hypnosis, for example, is said by some to revive traces of the original perception, thereby facilitating vivid access to the original stimulus material; it may allow subjects to pay selective attention to the material to be remembered, thereby increasing the probability of accurate recall; or it may render the hypnotized subject more willing to guess, thereby increasing the probability of accurate recall; or it may render the hypnotized subject more willing to guess, thereby increasing response productivity and altering the criterion for response. Such issues are relevant to the current debate about the forensic utility of hypnosis. The major message of this paper is that our understanding of the processes at work must depend ultimately on a thorough and complete understanding of the parameters that shape and define the nature of the hypnotic response itself.

A variety of conditions has now been isolated which has produced data associated with the acceptance or incorporation of misleading information into memory. Relatively few attempts have been made, however, to integrate these findings and isolate patterns of coherence in the data. This paper looks across three different types of memory test situation in hypnosis and tries to isolate key parameters with a view to examining the hypothesis that memory error in hypnosis can be explained in terms of a general model, predicting uniform and consistent effects.

In the paper, "hypnosis" is accepted as a term which reflects the operation of a particular context of influence. This context heavily motivates a subject toward giving role-appropriate behavior, suggestion communications are typically used to alter or modify the subject's behavior, and person characteristics of the hypnotized subject interact with setting constraints to define the final, detailed form of the hypnotic response. It should also be recognized that there are optimal conditions for observing hypnotic responses that provide the "truest" conditions for assessing its meaning. Typically, these are provided by the administration of hypnotic induction instructions to subjects who have demonstrated previously that they are capable of responding positively to suggestions requiring them to distort reality in a radical way.

The three memory test situations examined in the paper are: (a) the subtle injection of false information about an event by suggestion after the event has taken place; (b) the application of explicit suggestion to establish a pseudomemory of an event that has occurred previously; and (c) the use of leading questions about a past event where the questions imply incorrect facts. All these communications of false information are postevent, each reflects the operation of

suggestion (explicit, or otherwise) to communicate or imply specific information, and all of the communications cue distortion or memory error. With respect to the hypnotic literature, no sharp distinctions are usually drawn among these three situations, and one might reasonably expect that consistencies and regularities will occur in the data. Arguments extrapolating from the data to the real-life forensic setting certainly tend to assume that such regularities exist. One should not presuppose, however, that similar factors will characterize the explanation of effects associated with these different memory contexts.[1]

Postevent, Subtle Suggestion

This situation essentially adapted the procedures of Loftus, Miller, and Burns (1978) who found that subjects given misleading information prior to recall demonstrated less accurate memory performance than subjects who were given consistent or irrelevant information. Typically, the procedures used tested subjects initially for their memory of an incident shown in a slide series, and in so doing subtly introduced them to incorrect information about the events that subjects had perceived previously. After a period of time, subjects were retested by being presented with the incorrect information as an alternative for response. The measure of distortion that was of special interest was the acceptance or incorporation of the incorrect information into subjects' memory reports.

In a program of research that is reported more fully elsewhere (Sheehan, 1988), three false items of information were suggested subtly to subjects. The term "subtle" in this context is taken to indicate that the false information was given to subjects as an aside, preparatory to asking them later about other information in the event series. The method is such that even though suggestion has been delivered, the subject is very unlikely to realize that intent of the experimenter who cues the error.

Six independent studies were conducted in which these procedures were instituted, and in each study, misleading information was appreciably incorporated into subjects' memory reports. When the false information was introduced *before* hypnosis, the misinformation effect did not distinguish high or low suggestible subjects, hypnotizable or simulating subjects, or subjects given waking or hypnotic instruction. When the false information was introduced *after* hypnosis, however, effects that were distinctive to the hypnotic condition emerged.[2]

[1] Emphasis in this paper is placed on cognitive and social factors as they influence effects for subjects when encoding conditions are relatively comparable. Data appear elsewhere to indicate that when encoding conditions vary, the degree of acceptance of misleading information may well be affected. Subjects, for example, show greater acceptance of misleading information when they pay less (rather than more) attention to the thematic content of the stimuli at the time of encoding (Reid & Bruce, 1988). The focus of the present paper is on factors affecting distortion that are associated with post-encoding conditions or test procedures. The data presented do not determine whether memory is actually altered as a result of the acceptance of false information; it is possible, for instance, that priming effects or specific features of response options available at the time of retrieval operate to influence performance outcomes. However, the studies do address the issue of subjects' memory reports as they are influenced by the false information that is suggested to them.

[2] Study 6 was the exception, but here the time between presentation of the false information and test of memory was not comparable with the other studies.

Table 1 illustrates the pattern of findings in the series of studies as a whole and notes the presence of stimulus-specific effects. In each of the studies, this effect (defined in terms of the acceptance of the misleading information; see Sheehan, 1988, for details) was indicated by the misinformation effect being appreciably stronger for one stimulus rather than another. Consistently, through the program of work as a whole, the incorporation of false information occurred for some stimuli and not for others, and the strength of the incorporation effect was predictable from one study to the next in terms of which stimulus was used. The frequency with which this effect occurred was reliable. In the most theoretically significant of the studies (Study 4, Table 1; Sheehan, Grigg, & McCann, 1984) where hypnotic subjects were differentiated significantly from simulating subjects, results indicated that memory distortion could be a distinctive effect of hypnosis.

Table 1. Occurrence of misinformation effect for one or more stimuli across program of research

Study	Time of injection of false information	Presence/ absence	Related especially to hypnosis	Stim. specific effect
Study 1	Before hypnosis	Present[a]	No	Present
Study 2	Before hypnosis	Present[b,c]	No	Present
Study 3	Before hypnosis	Present[b,c]	No	Present
Study 4	After hypnosis	Present[a]	Yes, R/S[b]	Present
Study 5	After hypnosis	Present[b]	Yes, H/L[d]	Present
Study 6	After hypnosis	Present	No	Present

R/S indicates that effect is greater for real than for simulating subjects. H/L indicates that effect is greater for high than for low susceptible subjects. "Present" in the final column means that the effect favored the same stimulus in each study (the slogan "Nixon" on a jacket). It should be noted that subjects in study 6 incorporated misleading information into their memory reports, but no nonmisleading condition was used for the purposes of control (as in studies 1-5).

[a] $P < .01$

[b] $P < .001$

[c] Effect observed in free recall as well as recognition ($P < .05$ for study 2; and $P < .001$ for study 3).

[d] $P < .05$

Overall, one can conclude from the pattern of data for this effect that incorporation of misleading information into memory reports by these procedures of suggestion occurs frequently, the effect is readily quantifiable, some stimuli show the distortion effect more easily than others, and the effect is augmented in hypnosis when false information is given after, rather than before, hypnosis is introduced. Stimulus effects index the influence of nonhypnotic (social) factors that play a part in defining the degree of memory distortion that will be shown in hypnosis. The presence of a distinctive effect following hypnotic instruction points to factors of influence that are cognitive in character. In part, at least, explanation of the effect has been linked to the relative lack of attention to the false information that is presented, implicating distinctive attentional processing of the information suggested in hypnosis (see Sheehan et al., 1984).

Pseudomemory Suggestion

Relatively little direct experimental evidence is available on the use of explicit suggestion to create a well-defined pseudomemory. However, Orne (1979) first set out the procedures for the demonstration of pseudomemory in hypnotic subjects which were subsequently illustrated in a case application presented by Barnes (1982). Laurence and Perry (1983) provided the first experimental demonstration of the phenomenon in a procedure modeled on Orne's work. Labelle and Perry (1986) replicated the phenomenon, and Spanos and McLean (1986) and McCann and Sheehan (1987, 1988) conducted later studies that have extended the effect, using the same general paradigm of pseudomemory creation.

Essentially, this paradigm tests for experience of an event, introduces explicitly obvious suggestions for restructuring the event following hypnotic induction, and then routinely tests for the occurrence of false memory after hypnosis has been terminated and the subject has awakened.

In a series of studies utilizing a video tape of a simulated bank robbery (Yuille, 1982), McCann and Sheehan (1988) reported that the incidence of pseudomemory is stable and consistent when strict criteria of scoring are adopted, but the rate of occurrence is influenced particularly by social, contextual factors. Dependent upon particular hypnotist instructions, scoring criteria and stimulus features, incidence of pseudomemory ranged from 27 % to in excess of 75 % among susceptible subjects. The most interesting effect, however, was reflected in the capacity of the pseudomemory response to shift from one retrieval context to another. In a recent study (McCann & Sheehan, 1987), 32 highly susceptible subjects were tested subsequently for pseudomemory in recall. Half the sample was tested for recall followed by recognition, and the other half was tested for recognition prior to recall. The incidence of pseudomemory in recall was significantly lower when recognition came first in the testing sequence.

This research tells us that the phenomenon of pseudomemory is not a permanent response which prevents all access to other, conflicting memories, and the phenomenon is rather more contextually based, it would seem, than the data on the misinformation effect (reviewed in Table 1) would lead us to believe.

Table 2 sets out the incidence of the effect found by McCann and Sheehan (1987) for the two orders of conditions and reports the frequencies that were associated with the three false stimulus features of the video display that were suggested explicitly by the hypnotist: the robber wore a mask (which he did not), the robber entered from the right (when he entered from the left), and the robber swore heavily (which he did not). Overall, results showed very substantial differences in the impact of suggested events on the incidence of pseudomemory. Appreciable differences occurred in rate of frequency of the phenomenon, depending on the context in which it was tested. Incidence dropped markedly when the correct response was initially cued very strongly, compared with testing the response first in a context in which subjects were left free to report on events in their own way. Of possibly greatest theoretical interest, however, were two susceptible subjects who identified the target video correctly in recognition, but went on later to display pseudomemory in free recall immediately following. One might offer the provocative conclusion that for some persons at least, it seems that being right the first time means very little in remembering what is obvious in the next time round.

Table 2. Incidence of pseudomemory in recall across memory test conditions (for three suggested stimuli). (Data from McCann and Sheehan, 1987).

Order of conditions	Stimulus	Incidence of effect (*n*)	(%)
Recall-recognition (n = 15)	Mask	5	71
	Right	2	29
	Swearing	1	14
Recognition-*recall* (n = 16)	Mask	2	100
	Right	-	
	Swearing	-	

The incidence of any occurrence of pseudomemory was 46.7 % in recall-recognition order, and 12.5 % in recognition-recall order.

Leading Questions

In a number of studies in the program of work reported in Table 1, subjects were told by the hypnotist to close their eyes and imagine the scene where the robber was standing at the corner "about to cross the road." They were then asked to indicate, by raising the index finger of the right hand whether they could see "*the* traffic lights in this scene." This was a leading question in that the use of the definite article implied that the traffic lights were present (although they were not). The question tested for the occurrence of cued distortion where distortion was suggested relatively obviously and close to the time when memory was actually assessed. Table 3 sets out the incidence of effect in two studies when contrasting comparison groups were used. The table demonstrates that there were no differences in rate of performance between real and simulating subjects, and between high and low susceptible subjects, and that the rate of response to the suggestion that was communicated was only moderate in frequency. Findings suggest that previously reported interpretations of effects (e.g., hypnotized subjects are more likely to report the presence of nonpresent objects suggested by the use of the definite article than are subjects in a waking condition: see Putnam, 1979) are not entirely correct. There is no evidence from these data to imply that response to leading questions is reliably distinctive under conditions which optimally test hypnotic response.

When the explicitness of questions was modified in a later experiment, however, data showed effects which began to distinguish high susceptible from low susceptible subjects. In this independent study, high and low susceptible subjects were asked, "Do you remember that *a* set of traffic lights was there?". In this context, the communication of the suggestion was less apparent, and "obviousness" emerged as a possibly relevant factor. Here, high susceptible subjects reported

Table 3. Rate of response to leading question for three independent groups of subjects

Subject Group	Rate of response	
	(*n*)	(%)
High susceptible, under hypnotic instruction	39	38.5
Faking insusceptible (simulating)	40	30.0
Motivated insusceptible, under hypnotic instruction	28[a]	21.4

[a] An additional 14 % of subjects in this group said that although they could not see the lights, they remembered they were there.

more frequently (20 %) than low susceptible subjects (0 %) that they saw a set of lights, and also reported more frequently that they remembered that the lights were there (27 %, $n = 22$, as compared with 9 %, $n = 24$, for low susceptible subjects). These data suggest that if hypnosis does play a distinctive part in determining memory distortion then this is most likely to be the case when the obviousness of suggestion is reduced, or the communication of suggestion is relatively subtle.

Discussion

Research that looks across different distortion test situations appears to highlight a lack of generality of effects. It seems more accurate to argue that results implicate a range of factors determining memory distortion effects in hypnosis that will differ in their impact from one situation to another. Data point collectively to the complex contribution of state instruction (hypnosis) to effects, as well as the need to define the nature of the interaction between state instruction and level of susceptibility as they relate to different memory test situations.

It is instructive to consider a little further the studies that have been highlighted in this paper. In the study by Sheehan et al. (1984; see study 4, Table 1) real subjects were differentiated from simulating subjects, with real subjects showing greater acceptance of incorrect information. This study did not determine, however, whether level of susceptibility (rather than hypnosis) was related to the effect, since the design used did not separate the influence of state instruction from the influence of degree of hypnotizability. the study is significant in that it took a very conservative index of memory distortion - one shown previously not to generally distinguish hypnosis from waking subjects (see Sheehan & Tilden, 1983) - and demonstrated that hypnosis was accompanied by *more* rather than less distortion. Such a finding (and the lack of evidence for any memory superiority effect) reinforces the view that memory in hypnosis does not revive traces of the original perception. Rather, hypnotic memory (as for waking memory) is conceptualized most adequately as a constructive product. The question remains, however, whether cognitive factors such as a "lowered level of critical scrutiny," or "reduced awareness of the false information" characterizes hypnotic subjects' reactions to memory suggestion in a distinctive way. It may well be that hypnosis has the greatest part to play in distorting memory when specific (and subtle) suggestions are not very recognizable as suggestions, because attention is diverted to other information contained in the hypnotic communication.

Turning to the second situation (pseudomemory), the analyses tell us something different. Here there were definite indications in the pseudomemory test situation that some subjects evidenced a conformity reaction, especially since rates of response were in excess of 75 % (as opposed to 27 %) for specific features of the event series (those that were highly compatible with the overall cue context of the stimulus sequence). If pseudomemory response is susceptible to social influence as much as these preliminary data indicate, then it is particularly important to determine the character of the phenomenon among subjects who vary in their susceptibility to suggestion. For those subjects who are likely to respond in a compliant or conforming way, it is possible that neither a high level of susceptibility nor hypnotic instruction are really necessary for gross distortion to occur. Just as further work is needed on Loftus' distortion index to unconfound the effects of state instruction and level of susceptibility, additional work is needed on pseudomemory to investigate the phenomenon among high, medium, and low hypnotizable subjects, operating under waking and hypnotic instruction.

Inquiring in a leading way represents the third main context for studying the generality of memory distortion effects in hypnosis. The major reference point for research on the impact of hypnosis on recall following the introduction of leading questions is the work by Putnam (1979) who studied state instruction conditions (hypnosis, waking) and temporal conditions (short, long delay) in recall. The major variable of interest to Putnam was the number of errors made on a questionnaire relating to a videotape enactment of a car-bicycle accident. After the relevant delay, subjects in the hypnosis group were asked questions that consisted of items phrased in a leading or a nonleading way, the leading questions suggesting false answers. Data showed that hypnotized subjects were appreciably more in error on the leading questions than subjects in a no hypnosis control group. Putnam, however, did not look systematically at the impact of level of susceptibility. Close reading of the published account indicates that subjects were for the most part moderate to high in hypnotic susceptibility. A follow-up study by Zelig and Beidleman (1981) investigated the impact of leading questions and found that subjects in the hypnosis (vs. waking) group responded more frequently in the direction implied by the leading questions. Subjects in this study, however, were also restricted to the moderate-high range of susceptibility. More recently, unpublished work by Rainer (1984) investigated comprehensively whether implanted false information and leading questions have a greater effect on high hypnotizable than low hypnotizable subjects during hypnosis. Her work showed that hypnosis per se, or as moderated by hypnotic susceptibility level, did not have a significant effect on accuracy or degree of response to leading questions. A number of her leading questions, however, contained blatantly contradictory information, and past research by Loftus (1979) has indicated that blatant misinformation is frequently rejected by subjects (stimulus features again seem to be important). When blatant contradictory material is not used, and subgroups of the total hypnotic population are canvassed, then state instruction might relate more reliably to the incorporation of incorrect information into memory via leading questions.

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Inquiring in a leading way represents the third main context for studying the generality of memory distortion effects in hypnosis. The major reference point for research on the impact of hypnosis on recall following the introduction of leading questions is the work by Putnam (1979) who studied state instruction conditions (hypnosis, waking) and temporal conditions (short, long delay) in recall. The major variable of interest to Putnam was the number of errors made on a questionnaire relating to a videotape enactment of a car-bicycle accident. After the relevant delay, subjects in the hypnosis group were asked questions that consisted of items phrased in a leading or a nonleading way, the leading questions suggesting false answers. Data showed that hypnotized subjects were appreciably more in error on the leading questions than subjects in a no hypnosis control group. Putnam, however, did not look systematically at the impact of level of susceptibility. Close reading of the published account indicates that subjects were for the most part moderate to high in hypnotic susceptibility. A follow-up study by Zelig and Beidleman (1981) investigated the impact of leading questions and found that subjects in the hypnosis (vs. waking) group responded more frequently in the direction implied by the leading questions. Subjects in this study, however, were also restricted to the moderate-high range of susceptibility. More recently, unpublished work by Rainer (1984) investigated comprehensively whether implanted false information and leading questions have a greater effect on high hypnotizable than low hypnotizable subjects during hypnosis. Her work showed that hypnosis per se, or as moderated by hypnotic susceptibility level, did not have a significant effect on accuracy or degree of response to leading questions. A number of her leading questions, however, contained blatantly contradictory information, and past research by Loftus (1979) has indicated that blatant misinformation is frequently rejected by subjects (stimulus features again seem to be important). When blatant contradictory material is not used, and subgroups of the total hypnotic population are canvassed, then state instruction might relate more reliably to the incorporation of incorrect information into memory via leading questions.

Conclusion

Many studies now bear upon the analysis of human memory performance in the hypnotic setting (for broad review see Relinger, 1984; Smith, 1983), but the methodologies associated with most of them are incomplete. A major conclusion I would draw on the evidence is that there is no general uniformity of effects. There are occasions on which memory appears relatively distorted in hypnosis, and occasions when it does not. Opportunities for transmitting inaccuracies differ greatly according to how exactly false information is suggested and a variety of parameters such as state instruction, stimulus attribute, level of awareness of the false information that is presented, and level of susceptibility most likely mediate performance effects differently in varying suggestion-communication settings that might at first appear "reasonably" similar.

It is my belief that if a general model does pertain to effects in the area of postevent suggested memory distortion, it is likely to be one in which different process dimensions are at times working together. There is evidence in the program of work that has been examined here, for example, that factors of compliance and genuine responsiveness operate jointly, with compliance perhaps operating most noticeably in cued distortion contexts (such as pseudomemory) in which subjects' awareness of the treatment manipulation is obvious.[3] Assessing the meaning of the relative contributions of these two factors (see also, Tellegen, 1978/1979) - as one moves from one area of cued distortion to another - poses for me perhaps the most interesting theoretical challenge in the field.

Acknowledgement. This paper was prepared with the support of the Australian Research Council through a grant made by that agency to the author for the analysis of hypnotic susceptibility and memory distortion in hypnosis.

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[3] The distinction made here possibly relates to that offered by Gudjonsson (1984) between suggestive information that misleads and elements of a situation that convey interpersonal pressure. The two types of suggestibility implicated by these factors have been shown by Gudjonsson to be relatively independent, poorly correlated, and to load on separate factors.

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