Memory Distortions and Suggestibility in the Hypnotic Setting

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This chapter looks at the occurrences of memory distortion in the hypnotic setting and reports in detail on the application to its study of a range of methodologies or paradigms. It addresses major parameters associated with the operation of memory in hypnosis, and comments especially on the importance of suggestibility as defined in the hypnotic setting. Individual differences in responsiveness to hypnotic suggestion play an especially salient role in shaping the nature and extent of memory distortion. Possible mediating factors are discussed.

Significant distortion of memory may occur both in waking and hypnosis, and there are many different theoretical points of interest about that phenomenon. One is that this distortion may be appreciably greater in hypnosis, than in waking, because suggestion used in hypnosis itself may be inherently distorting. Another is that the distortion that occurs in hypnosis (regardless of its cause) is procedure-specific and will differ appreciably according to how false information concerning previously witnessed events is communicated to subjects and how this influences their memory reports as regards those events. False information may be suggested subtly through exposing subjects to misleading events that imply incorrect facts about what really happened (e.g. through the use of questions designed to be subtly misleading). Alternatively it may be suggested more directly, as, for example, through explicitly suggested pseudomemories.

If the extent of distortion itself is methodology-specific, this raises major theoretical questions about why particular effects occur for specific sets of procedures. Specific methodologies, however, also provide the opportunity for particular variables to show their influence. This is the special focus of this paper and the variable of interest is "confidence", one that has also been reviewed quite comprehensively elsewhere (see McConkey, 1989; Pettinati, 1988; see also, McConkey & Sheehan, 1995).

My concern is essentially with the pattern of effects that is observed when false information is transmitted via leading questions. To put this issue in comparative perspective, I want to first examine effects obtained for procedures adapted from Elizabeth

Loftus; then, I shall review effects observed in other studies, majorly concerned with hypnosis; finally I will turn to focus on recent data from experiments dealing with leading questions that illustrate new insights about the relevance of "confidence".

Application of Loftus-type Procedures

Elizabeth Loftus and her associates have experimented over a long period of time with procedures associated with substantial distortion of memory (see Loftus, 1979; Loftus & Hoffman, 1989; E. Loftus & G. Loftus, 1980). The work has generally not been related by her to hypnosis (e.g., Loftus, 1979; Loftus, Miller & Burns, 1978), but the procedures are distinctive enough and are sufficiently relevant to hypnosis that they can be usefully viewed as a distinctive category of pertinent experimental data.

Effects obtained from application of her procedures are typically associated with false information being injected into the test situation via the process of subtle suggestion. The research approach injects information that conveys incorrect details about events when memory is tested. Typically, items that pose questions, or make statements about the stimulus material (subjects have seen previously), provide content that is false. The methods are ideally suited in many ways to investigating the strength of the relationship between hypnosis and reduced resistance to false information.

If, as Loftus and her associates have argued (see, for example, Loftus et al., 1978), false information will be incorporated reliably into waking memory through the subtle injection of false cues about events seen previously, then it becomes an important question, and one with major forensic implications, whether or not specific distortion effects for the same procedures will be especially evident in hypnosis and more so than in the waking state.

Loftus' procedures have been adapted for use in the study of hypnosis by a number of different researchers. Focus here, however, will be on those conducted in my own laboratory. In this program of work (for review, see Sheehan, 1988; and McConkey & Sheehan, 1995), a slide series of a robbery was shown before hypnosis; false information was presented prior to induction in some studies, but following induction in others; the program used standard waking/hypnosis comparison groups; and also applied Orne's (see Orne, 1959) real-simulating methodology to isolate cues for memory performance inherent in the overall test situation.

In an extensive program of work on memory performance across a range of different comparison conditions and memory controls, the research showed that the presence of different controls (e.g., time of injection of false information), modes of memory testing (e.g., free recall, and recognition), and comparison conditions (e.g., state instruction, real-simulating instruction) and level of suggestibility do not appreciably result in memory enhancement. Rather, data are characterised by memory distortion, memory performance being erratic (e.g., Sheehan & Tilden, 1986) and especially so when false information is injected after, rather than before hypnosis is introduced. Strong distortion effects were typically associated with high levels of suggestibility.

When Loftus-type procedures were adopted for study of memory distortion in the hypnotic setting, it was level of susceptibility to hypnosis that appeared to be the major defining parameter, not hypnotic instruction.

In four of the six independent experiments conducted, and where distortion was evident, high suggestible subjects who received hypnotic instruction evidenced a significantly greater error effect than did low hypnotisable subjects. Further, susceptible subjects who were hypnotised showed more distortion than did simulating subjects who were not susceptible to hypnosis and told to act as if they were good hypnotic subjects. The most consistent effect across all studies in the program was that high hypnotisability in the hypnotic setting was related appreciably to distortion. The hypnotic setting itself conveyed cues for distortion, but memory distortion was likely to be shown most by those who were more suggestible than others.

The same importance of level of susceptibility to hypnosis has been observed by Barnier and McConkey (1993) in their independent work. Using Loftus-type procedures and exposing subjects to the same purse-snatching incident, false information was injected subtly in the memory testing procedures. Their data indicated that hypnotisability, and not hypnosis, was associated with false memory reports. More high than low susceptible people reported memories that were incorrect. Barnier and McConkey also showed, however, that the factor of hypnotic instruction operated influentially when testing was conducted by an independent experimenter.

In all of these studies, and where comparison with waking subjects was used, there was no support for the position that hypnosis is appreciably more distorting than the waking state, but hypnosis (compared with waking) led reliably to greater confidence in the memories being reported. Confidence emerged through all of the studies as a relevant parameter, data illustrating higher confidence effects for hypnosis (vs waking) instruction, and for high (vs low) susceptibility to hypnosis. Close analysis of effects shows that confidence is, in fact, a seemingly reliable correlate of memory distortion.

Other Leading Question Studies

In the general area of leading questions and hypnosis, a number of well known studies have been discussed in detail in the literature. Consider, for example, the classic experiments conducted by Putnam (1979), Register and Kihlstrom (1988), Sanders and Simmons (1983), Yuille and McEwan (1985), and Zelig and Beidleman (1981). There is considerable inconsistency in the data from these studies, and there is substantial diversity in the effects observed - effects are more diverse, for instance, than in the case of the study of pseudomemory. Perusal of these studies suggests that a number of parameters explain the inconsistency (see McConkey, 1992, and McConkey & Sheehan, 1995, for further review). Relevant factors include questions used that do not actually lead subjects though they are intended to do so, and differing proportions of leading and nonleading questions adopted in experimental designs. In summary of the effects observed, research shows that the procedures used in the laboratory greatly affect the

memory outcomes that subjects will display. Factors further include the type of hypnotic procedure used, the level of hypnotisability (suggestibility) of subjects, the nature of the leading questions, the timing of their introduction, and the way in which subjects' recall is examined. While not all studies have highlighted a strong influence for confidence (e.g., Mingay, 1986; Putnam, 1979; Yuille & McEwan, 1985; and Zelig & Beidleman, 1981) there is nevertheless sufficient consistency as far as the variable "confidence" is concerned (for review, see Pettinati, 1988; and McConkey, 1989, 1992) that the conviction of subjects remains a major relevant parameter.

A Relevant Program of Research

Consistent with some of the designs of the studies just reviewed, false information in the laboratory setting can be conveyed implicitly via the formal structure of the questions asked. It seems appropriate therefore to address the issue whether generally comparable patterns of effects (as reported above) will be observed when false information is conveyed via the formal linguistic features of the questions that are asked. This contrasts with the general thrust of the content-based parameters emphasised in many of the Loftus-type procedures.

With this approach in mind, we turn to consider the implications of some recent data which bear upon the emerging importance of confidence.

The data in question are drawn from a program of work conducted on leading questions which was developed as an integrated series of three experiments (Sheehan, Garnett, & Robertson, 1993; and Sheehan & Linton, 1993; Linton & Sheehan, 1994). The data set includes both published and unpublished results. Each study investigated the effects for responding to false information suggested via leading questions in which the cues subjects received were manipulated by varying sentence structure, the cues given to respond falsely being either strong or weak (high vs. low). Routinely, subjects were tested under either hypnosis or waking instruction, and memory was examined for both free recall and structured recall. Focus here is on structured recall only.

Study 1

The first study (see Sheehan et al., 1993 for further details) applied the general set of procedures just described to analyse the acceptance of false information. Procedures to manipulate cue structure were modified from Loftus and Zanni (1975) and subjects' responses were examined across two sessions to look at change over time in memory distortion. Eight leading questions probed recall. Subjects were asked, for example, whether they noticed "*the* orange shirt on the man who was shot" (high structured item), and whether they noticed "*a* young girl standing in the airport lounge" (low structured item). Table 1 sets out the major effects that were observed.

Consistent with the general pattern emerging, the overall thrust of the data was an absence of effects for state instruction, and the presence of susceptibility effects. However, a quite unexpected effect emerged, the opposite of what was predicted, for level of cue structure. Specifically, it was the low and not high cue structure that was

Table 1: *Summary of Effects for Acceptance of False Information in Study 1*

Effects	Description
Susceptibility*	High susceptible Ss accepted more false items than did low susceptible SS
Cue Structure***	Low cue structured questions showed a higher rate of acceptance of false information than did high structured ones
Session**	False information was accepted more readily in Session 2 than in Session 1
Susceptibility X Cue Structure X Session*	High susceptible Ss accepted more high cue structured questions in Session 2

Note - * p less than .05
** p less than .01
*** p less than .001

associated with greater acceptance of the false information. The effect was puzzling: why should items, not cueing false reports more strongly, yield the greater distortion?

In the study, there were indications that confidence was playing a possibly relevant role. Relatively distinctive cognitive processes seemed to be associated with the highly cued items. High susceptible subjects were more confident of their answers than low susceptible subjects, but subjects were actually more confident of their answers to low structured leading questions (sentences focusing on the article "a") than to high structured leading questions (sentences focusing on the article "the"). High susceptible subjects were more confident than low susceptible subjects overall but they were particularly confident on the low structured leading questions. Overall, the pattern of results for confidence suggested there was a need to tie confidence down in some way so as to allow possible memory distortion effects to emerge.

Study 2

This study (see Sheehan & Linton, 1993, for further details) aimed to eliminate the possibly confounding influences of differential cognitive processing requirements by ensuring that the format across all stimulus items was more comparable in terms of linguistic structure. The articles "the" and "a" were again employed to differentiate high from low cue-structured items, but question references, this time were identified more precisely: for example, a question about the victim's bag (a false, low structured item) changed from "Was the man who was shot carrying a bag?" to "Did you see a bag in the hands of the man who was shot?" The hypothesis was again investigated that state

Table 2: *Summary of Effects for Acceptance of False Suggestions in Study 2*

Effects	Description
Susceptibility*	Greater acceptance of false information by high (vs low) susceptible subjects
Cue Structure***	Greater acceptance of false information for low (vs high) cue structured questions
No hypnosis or interaction effects	

Note - * p less than .05
*** p less than .001

instruction, level of susceptibility and the cue structure of leading questions would operate jointly to determine subjects' acceptance of false information. Following the trend of the data for the other methodologies, the greatest acceptance of false information was predicted to occur for high susceptible subjects responding to highly cued stimuli while under hypnosis. To test whether individual differences were related to the phenomenon, especially large numbers of subjects (approximately 40) were tested in each of the cells of a 3-factor design: high and low susceptible subjects were tested under either waking or hypnotic instruction, and recalled events cued by both high and low structured questions. Table 2 summarises the results.

When analyses were conducted on subjects' ratings of how confident they were about their responses, effects paralleled relatively precisely those found for accuracy. There were main effects for cue structure and susceptibility; as before, subjects were more confident on low-leading than on high leading questions, and high susceptible subjects were more confident overall than low susceptible subjects. Further, when false information was suggested it was low rather than high leading questions that were associated with the greater acceptance of false information. In essence, the effects observed for level of cue structure, despite the improved construction of the questions, again showed a reversal of effects for cue structure from what was expected. And data continued to suggest a covert influence of confidence that needed further investigation. Study 3 aimed to take the investigation one step further. Specifically, the last of this set of studies was designed to vary cue structure, while attempting to hold confidence as stable as possible.

Study 3

In this experiment (see Linton & Sheehan, 1994 for further details), it was decided on the basis of the previous two studies to manipulate subjective confidence explicitly by prefacing stimulus questions with positive assertions regarding the presence of objec-

Table 3: *Summary of Effects for both Accuracy and Confidence for Acceptance of False Suggestions in Study 3*

	Effects	Description
Accuracy	State Instruction*	Hypnosis (vs waking) instruction associated with greater acceptance of false information
	Cue Structure*	More false information accepted for low (vs high) cue structured questions
	Susceptibility X State Instruction***	Susceptible Ss given hypnosis (vs waking) instruction much more accepting of false information
Confidence	State Instruction*	As above for accuracy
	Cue Structure*	As above for accuracy
	Susceptibility**	Highly susceptible Ss more confident than medium and low susceptible subjects
	Susceptibility X State Instruction***	As above for accuracy

Note * p less than .05
** p less than .01
*** p less than .001

ts or events in the video, and to urge subjects to be as confident as they could be in their responses (irrespective of their condition). The overall design was very similar to that used in Studies 1 and 2, except in this major respect (and the introduction of medium susceptibility as an extra "level" of suggestibility). The video was identical, and the same factors - state instruction, level of susceptibility, and level of cue structure - were studied, as before.

To ensure that the design met the major goal of the study, which was to control confidence across cue conditions, a pilot study (or "non-experiment" quasi-control investigation) was conducted to test the hypothesis that the modified set of stimulus items reflected the intended impact of the differences in linguistic structure. The pilot study also explored whether subjects' confidence in the presence of objects and events was enhanced by the experimenter's exhortations to subjects to be as confident as possible.

Pilot testing was conducted with subjects under waking instruction. After viewing the video, subjects were presented with the revised set of stimulus items and asked to indicate the degree to which they felt that the item, by the way it was worded or structured was pulling a "yes" response. Analysis revealed that subjects rated high cue-structured questions as pulling a "yes" response significantly more strongly than lowstruc-

Table 4: *Differences (High-Low) in Cue Structure Effects for both Accuracy and Confidence for Acceptance of False Suggestions in Study 3*

Level of Susceptibility	State Instruction	Difference Score	
		Accuracy	Confidence
High	Hypnosis	+.16	+.19
	Waking	-.15	-.48
Medium	Hypnosis	-.30	-.40
	Waking	-.05	-.53
Low	Hypnosis	-.29	-.61
	Waking	-.17	-.50

Note Scores for each condition represent the difference in accuracy (or confidence) between high and low cue structured items.
The reversal of cue effect for the high susceptible, hypnosis group is distinctive.

tured questions, results supporting the hypothesis that the questions were structurally distinct. Comparison of confidence ratings across this and the previous study showed that confidence was enhanced significantly by the use of the new exhortation procedures.

Table 3 sets out the pattern of the results that was obtained. Because of the critical focus of this study on both confidence and accuracy, results for both these measures are summarised.

Pilot data had indicated that the format of the questions used in this study promoted much greater confidence in subjects for high structured questions. The effects observed in both of the previous studies in relation to cue structure were not eliminated when distortion effects were actually tested, but the pattern of the data was distinctive. Table 4 looks at the patterning of results by focusing on what distinctively happened for the group of high susceptible subjects given hypnosis instruction. The table abstracts effects from the study by looking from cell to cell at how accuracy paralleled confidence. The table shows a distinctive reversal of effect for this one group.

A number of challenging inferences can be drawn from the data in Tables 3 and 4. First, level of susceptibility appears to yield its effect for confidence independent (or at least partially so) of accuracy, whereas the cue structure and state instruction factors do not. Confidence closely paralleled accuracy for the acceptance of false information communicated through leading questions. Low structure items, however, continued to

exert greater acceptance of false information than for high structure items - except for high susceptible subjects receiving hypnotic instruction. The effect of sentence structure for this group was distinctively reversed, the modified design operating to isolate this group in the pattern of its performance.

Conclusions

The program as a whole served to highlight the general significance and importance of the confidence variable. Confidence has emerged as important in a range of studies and in studies that have used very different sets of procedures. Overall, the data on memory distortion and response to leading questions tell us that broad-based suggestibility effects are replicable and effects for high susceptible subjects are generally congruent with those observed in the application of other different methodologies and other aspects of interrogative questioning (see Gudjonsson, 1984, 1987, 1992, for detailed reports of research on interrogative suggestibility). Results suggest, however, that the *pattern* of effects varies according to the way misleading information is communicated, and the influence of confidence may cloud effects that appear in other methodologies. When false information is injected into the laboratory situation via leading questions, the pattern of effects varies compared with when it is injected in other ways, and the direction in which the pattern changes is relatively distinctive.

The pattern of data found in the studies conducted here, and concerned with the linguistic structure of questions, highlights the impact of confidence in a number of unusual ways.

For example, the research methodology was one where the confidence of subjects possibly overrode the potential effect of other variables. Forensically speaking, given the impact and the influence of the confidence variable in other methodologies, it may well be defensible to argue that the conviction of subjects offers grounds for special caution in advocating the use of hypnosis in legal contexts. Elsewhere, Kevin McConkey and I (McConkey & Sheehan, 1995) have demonstrated that confidence is a major accompaniment to leading questions in cases occurring in the real-life forensic setting.

Research overall emphasises that the most substantial risk to using hypnosis lies perhaps not in the tendency to misreport so much as the tendency for hypnotised persons to be overconfident in their reporting. This confidence effect is pervasive enough in the experimental literature that it may well offer sufficient grounds for limiting the utility of hypnosis in the forensic setting. The data on leading questions provide us, perhaps, with some fresh insights on the possible validity of that position.

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References

Barnier, A. J., & McConkey, K. M. (1993). Reports of real and false memories: The relevance of hypnosis, hypnotisability, and context of memory test. *Journal of Abnormal Psychology, 3,* 521-527.

Gudjonsson, G. H. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences, 5,* 303-314.

Gudjonsson, G. H. (1987). Historical background to suggestibility: How interrogative suggestibility differs from other types of suggestibility. *Personality and Individual Differences, 8,* 347-355.

Gudjonsson, G. H. (1992). *The psychology of interrogations, confessions and testimony.* London: Wiley.

Linton, C. P., & Sheehan P.W. (1994). The relationship between interrogative suggestibility and susceptibility to hypnosis. *Australian Journal of Clinical and Experimental Hypnosis, 22,* 53-64.

Loftus, E. F. (1979). *Eyewitness testimony.* Cambridge, Mass.: Harvard University Press.

Loftus, E. F., & Hoffman, H. G. (1989). Misinformation and memory: The creation of new memories. *Journal of Experimental Psychology: General, 118,* 100-104.

Loftus, E. F., & Loftus, G. R. (1980). On the permanence of stored information in the human brain. *American Psychologist, 35,* 409-420.

Loftus, E. F., Miller, D. G., & Burns, H. J. (1978). Semantic integration of verbal information into a visual memory. *Journal of Experimental Psychology: Human Learning and Memory, 4,* 19-31.

Loftus, E. F., & Zanni, G. (1975). Eyewitness testimony: The influence of the wording of a question. *Bulletin of the Psychonomic Society, 5,* 86-88.

McConkey, K. M. (1989). Confidence in hypnotic hypermnesia. In A. F. Bennett, & K M. McConkey (Eds.), *Cognition in individual and social contents* (pp. 489-496).North-Holland: Elsevier Science Publishers B.V.

McConkey, K. M. (1992). The effects of hypnotic procedures on remembering: The experimental findings and their implications for forensic hypnosis. In E. Fromm & M. R. Nash (Eds.), *Contemporary Hypnosis Research* (pp. 405-426). New York: Guilford Press.

McConkey, K. M., & Kinoshita, S. (1988). The influence of hypnosis on memory after one day and one week. *Journal of Abnormal Psychology, 97,* 48-53.

McConkey, K. M., & Sheehan, P. W. (1995). *Hypnosis, memory and behavior in criminal investigation.* New York: Guildford Press

Mingay, D. J. (1986). Hypnosis and memory for incidentally learned scenes. *British Journal of Experimental and Clinical Hypnosis, 3,* 173-183.

Nogrady, H., McConkey, K. M., & Perry, C. (1985). Enhancing visual memory: Trying hypnosis, trying imagination, and trying again. *Journal of Abnormal Psychology, 94,* 195-204.

Orne, M. T. (1959). The nature of hypnosis: Artifact and essence. *Journal of Abnormal and Social Psychology, 58,* 277-299.

Pettinati, H. M. (Ed.) (1988). *Hypnosis and memory.* New York: Guilford Press.

Putnam, W. H. (1979). Hypnosis and distortions in eyewitness memory. *International Journal of Clinical and Experimental Hypnosis, 28,* 437-448.

Register, P. A., & Kihlstrom, J. F. (1988). Hypnosis and interrogative suggestibility. *Personality and Individual Differences, 9,* 549-558.

Sanders, G. S., & Simmons, W. L. (1983). Use of hypnosis to enhance eyewitness accuracy: Does it work? *Journal of Applied Psychology, 68,* 70-77.

Sheehan, P. W. (1988). Memory distortion in hypnosis. *International Journal of Clinical and Experimental Hypnosis, 36,* 296-311.

Sheehan, P. W., Garnett, M., & Robertson, R. (1993). The effects of cue level, hypnotisability, and state instruction on responses to leading questions. *International Journal of Clinical and Experimental Hypnosis, 41,* 287-304.

Sheehan, P. W., & Linton, C. P. (1993). Parameters influencing response to leading questions. *Australian Journal of Clinical and Experimental Hypnosis, 2,* 1-14.

Sheehan, P. W., & Statham, D. (1989). Hypnosis, the timing of its introduction, and acceptance of misleading information. *Journal of Abnormal Psychology, 98,* 170-176.

Sheehan, P. W., & Tilden, J. (1986). The consistency of occurrences of memory distortion following hypnotic induction. *International Journal of Clinical and Experimental Hypnosis, 34,* 122-137.

Wagstaff, G. F. (1982). Hypnosis and recognition of a face. *Perceptual and Motor Skills, 55,* 816-818.

Yuille, J. C., & McEwan, N. H. (1985). Use of hypnosis as an aid to eyewitness memory. *Journal of Applied Psychology,* 70, 389-400.

Zelig, M., & Beidleman, W. B. (1981). The investigative use of hypnosis: A word of caution. *International Journal of Clinical and Experimental Hypnosis, 29,* 401-412.