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PARAMETERS INFLUENCING RESPONSE TO LEADING QUESTIONS Peter W. Sheehan and Christopher P. Linton	1
HYPNOSIS — THE HEALER WITHIN Wendy-Louise Walker	15
HYPNOSIS IN A GENERAL PAEDIATRIC HOSPITAL SETTING Graham R. Wicks	23
LOGLINEAR ANALYSIS: BRIGHTER OR DIMMER AFTER THE PRIMER? Douglas Farnill	29
TEACHING HYPNOSIS: THE ANDRAGOGY AND DIRECT-TEACHING MODELS Russell M. F. Hawkins and Lia Kapelis	37
TIME-EFFICIENT SUPERVISION OF CLINICAL HYPNOSIS TRAINEES Lia Kapelis	45
REMEMBERING CHILDHOOD SEXUAL ABUSE Gordon Milne	49
EGO-ENHANCEMENT FOR POSITIVE CHANGE Harry E. Stanton	59
“TO BE” OR NOT “TO BE”: <i>THAT IS THE QUESTION</i> Andrew F. Houston	65
CASE NOTES, TECHNIQUES, AND ANECDOTES	69
BOOK REVIEWS	73

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PARAMETERS INFLUENCING RESPONSE TO LEADING QUESTIONS

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Eighty high- and 82 low-susceptible subjects responded under hypnotic or waking instruction to a series of questions relating to a previously witnessed event. Questions were designed to be either high- or low-leading in the extent to which they cued a particular response, and conveyed either true or false information. It was predicted that state instruction, level of susceptibility, and the cue-structure of the questions would influence subjects' acceptance of information conveyed by the questions. Results showed general support for this hypothesis, but effects were variable. Data overall indicate the importance of susceptibility in determining acceptance of false information cued by leading questions, and implicate subjective confidence as a parameter warranting further investigation.

A leading question can be defined as one which, either by form or content, suggests to a person what answer is desired or leads that person to the desired answer (Loftus & Palmer, 1974). Research addressing the influence of question format on subsequent response has a long history in the eyewitness testimony literature. It is now widely recognised that questions vary in the degree to which they lead people to answer in a particular way and that quite specific effects are associated with the nature of the suggestion that questions convey (Hilgard & Loftus, 1979; Loftus & Palmer, 1974; Loftus & Zanni, 1975; Sheehan, Garnett, & Robertson, in press).

Several studies have demonstrated that variations in even a single word in a question relating to a previously witnessed event can markedly affect a person's response to that question (Loftus & Palmer, 1974; Loftus & Zanni, 1975), and may even effect a reconstruction in a person's memory for that event, the memory being reframed to include the information implied (Loftus & Palmer, 1974).

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Loftus and Zanni (1975) varied only the articles "a" and "the" and found that people were more likely to agree to the existence of a question referent in the stimulus material if the referent was prefaced with "the" rather than with "a." The explanation for this effect was that "a" carries no assumption about the existence of the referent, whereas "the" does.

Given that hypnosis provides a clear and definite context for being influenced by suggestion, it seems reasonable to argue that the impact of asking leading questions should be enhanced in hypnosis, compared to the waking state. Putnam (1979), for example, found that subjects in hypnosis made more errors than subjects in a waking control condition when asked leading versus objective/non-leading questions; for non-leading questions, there were no differences between the two groups and there were no differences in confidence between the groups even though hypnosis subjects made more errors. This first result (for hypnosis) was borne out in a later study by Sanders and Simmons (1983). Zelig and Beidleman (1981) examined the effects of hypnosis on subjects' responses to leading (false) and non-leading (true) questions and found that subjects in hypnosis tended to accept more false information than those in the waking condition. In all these studies, however, susceptibility and state instruction were at least partially confounded as all subjects were drawn from a moderate to high range of hypnotic ability.

Studies that have included the variable of hypnotisability or hypnotic susceptibility within the leading questions testing context have yielded mixed results. Register and Kihlstrom (1988) examined the effects of asking leading questions on high- and low-susceptible subjects but found no effects for susceptibility. Sturm and Means (1985) examined both state instruction and level of susceptibility for their impact on responses to both leading and non-leading questions, and while no differences were found between non-susceptible groups, highly susceptible subjects receiving hypnosis instruction made more errors on leading questions than their counterparts in a waking condition.

In a very recent study of leading questions Sheehan et al. (in press) investigated the influence of a number of parameters, including susceptibility and state instruction, and also of what they termed the "cue-structure" or "leadingness" of stimulus items on subjects' responses to leading questions. The study employed two levels of cue-structure, which were differentiated clearly in pilot testing as being either high or low in the degree to which they were likely to elicit acceptance of the existence of the item's referent. No clear support was identified for the authors' prediction that highly susceptible subjects under hypnosis would accept more false information via strongly cued leading questions. Of considerable interest in the study, however, was why subjects in the study showed a greater degree of acquiescence to low as opposed to high cue-structure questions.

The explanation of this pattern of effects posited by Sheehan et al. was expressed in terms of Clark's (1978) analysis of linguistic processing and related to the differences in processing requirements of the two types of questions used

(high and low cue-structure). Clark's analysis describes four stages whereby an identification of a speaker's intended reference can be attained. In step 1 the listener computes the description of the intended reference; in step 2, the listener searches memory for an entity that fits the description provided and satisfies the criterion that the speaker could expect that he or she would select it uniquely on the basis of this description. If difficulty is experienced here the listener may proceed to step 3, where he or she adds the simplest possible assumption to memory that posits the existence of an entity which fits the description; and in step 4, the listener identifies this as the referent intended.

Sheehan et al. argue that in their study the stimulus questions could have differed substantially, in that low cue-structure items (e.g., "Was the man who was shot carrying a bag?") presented subjects with a simpler cognitive task than did the high cue-structure items (e.g., "Did you notice the orange shirt on the man who was shot?"). The latter demanded of subjects that they carry out a cognitive manoeuvre, namely, adding a bridging assumption (e.g., the man had been wearing an orange shirt), that many were not prepared to do, whereas the former items made no such requirement (needing only a yes/no decision).

Accordingly, the present study attempted to eliminate the possible confounding influences of differential cognitive processing requirements by ensuring that the format across all stimulus items was identical in terms of linguistic structure. Following Loftus and Zanni (1975), the articles "the" and "a" were employed to more clearly differentiate high from low cue-structure items. Pilot testing confirmed that with the set of stimulus items reported below, subjects were appreciably more inclined to agree to the presence of referents prefaced with "the" than with "a." Question referents were also much more clearly identified in the present set of items than in those used in the previous study. These modifications represent the main point of departure from the previous study and as such are an extension to, and a refinement of, the previous body of work.

The present study, then, examined memory distortion effects for the leading question format, varying state instruction, susceptibility and cue-structure as likely parameters influencing subjects' acceptance of information suggested by leading questions. While exploring closely the structure of questions asked, it aimed specifically to test the hypothesis that state instruction, level of susceptibility and the cue-structure of leading questions will operate jointly to determine subjects' acceptance of suggestions given by the experimenter. Specifically, it was predicted that the greatest acceptance of suggestions would occur for highly hypnotisable subjects responding to high cue-structure questions while under hypnosis.

A particular feature of the study as a whole was the inclusion of large numbers of subjects in the individual cells of the experimental design. This was done to allow ample opportunity for relevant individual differences to be detected. Overall, the study focused on the memory performance of subjects, but also explored the confidence of subjects in the responses they made.

PILOT TESTING FOR LEADING QUESTIONS

Stimulus questions adopted for the study are shown in Table 1. All stimulus items met the requirements of being: (a) peripheral, not central to events; (b) balanced for true and false information; (c) spread equally across the sequence of video events; (d) related to physical aspects, not sequence or action; and (e) where "false" meant there was a distortion of things actually present. In pilot testing, 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. Subjects indicated their perception of the strength of the influence of structure on a five-point scale from 1 (pulling a "Yes" response extremely strongly) to 5 (pulling a "Yes" response not at all).

A Student's *t* test was conducted to examine the differences between subjects' ratings of high and low cue-structure. Analysis revealed that subjects rated high cue-structure questions as pulling a "Yes" response significantly more strongly than low cue-structure questions ($t(6) = 2.75, p < .05$).

Table 1 Set of Stimulus Questions

1	Did you see the number 28 on the airport gate as passengers disembarked? (false, high structure)
2	Did you see the tape-deck being carried by the man walking across the tarmac? (correct, high structure)
3	Did you see a bag in the hands of the man who was shot? (false, low structure)
4	Did you see the orange shirt on the man who was shot? (correct, high structure)
5	Did you see a young girl in the airport waiting lounge as passengers came off the plane? (false, low structure)
6	Did you see a pair of white sandshoes on the man who was shot? (correct, low structure)
7	Did you see the brown felt hat lying on the floor next to the man who was shot? (false, high structure)
8	Did you see a set of blue striped markings on the plane from which passengers disembarked? (correct, low structure)

METHOD**Subjects**

The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962) was administered to 990 first-year psychology students participating for course credit. Six hundred and fifty-one subjects who scored in the range 0-4 and 8-12 were invited to return for individual testing on the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962). Of the 300 subjects who presented for this session, 162 subjects with consistent test scores across the group and individual screening

sessions were randomly assigned to conditions within a 2 (susceptibility: high, low) \times 2 (state: hypnosis, waking) design. Eighty high- and 82 low-susceptible subjects obtained mean susceptibility scores of 9.98 ($SD = 1.13$) and 2.35 ($SD = 1.16$) respectively on the HGSHS:A; mean scores for high and low susceptible subjects on the SHSS:C were 9.84 ($SD = 1.19$) and 1.20 ($SD = 1.13$), respectively.

Stimulus Materials

The stimulus material was a videotape depicting a shooting at an airport and the tape was the same as used in previous research in this laboratory (see Sheehan et al., in press). In the 2-minute video, the opening sequence shows planes taxiing and taking off and landing at a busy city airport. Passengers disembark from one plane and walk toward the terminal. People enter the terminal, where others are waiting in an airport lounge. The final scene (lasting 6 seconds) depicts one man being shot by another, and there is an ensuing scuffle involving the gunman.

The Tellegen Absorption Scale (Tellegen & Atkinson, 1974) and the shortened form of Betts' Questionnaire of Mental Imagery (Sheehan, 1967) were used as filler tasks to equate for time spent in hypnotic induction and de-induction, respectively.

Procedure

In order to establish consistency of expectations prior to the experiment proper, all subjects were informed that the study was concerned with emotional arousal to visual stimuli. Subjects were first instructed to view the video and were told that it was taken from a newsclip of events that had actually occurred. Immediately following their viewing of the video, subjects were requested to rate how aggressive they perceived the incident to be on a scale from *low aggressive* (1) to *extremely aggressive* (5).

At this point a standard hypnosis induction procedure was conducted for those in the hypnosis condition, while those in the waking condition completed the Tellegen Absorption Scale. Suggestion tasks included hand lowering, hypnotic dream, pseudo-anaesthesia, arm immobilisation, and age regression and were administered individually in that order to all subjects. Subjects in the waking condition were given specific instructions to remain out of hypnosis at all times.

At the conclusion of age regression testing, all subjects were asked to "relive" the scene in their minds and to imagine that they had just witnessed it and were going to be questioned by the police about the details (Putnam, 1979). They were told they could zoom in on the scene, slow it down or speed it up (after Reiser, 1976); and that "everything is recorded and you can remember it . . . All you have to do is try."

Test of free recall and structured recall was given in alternate order. For free recall, subjects in each condition were allowed the time of the video in

which to replay the scene in their minds and then to recall the events they had witnessed as vividly and accurately (and in as much detail) as they could. These subjects then rated the confidence they had in their accuracy of the recalled material on a scale ranging from *not confident at all* (1) to *perfectly confident* (5). All reported memories were recorded on audiotape. In the structured format, subjects were presented with the set of eight stimulus questions (see Table 1) and were requested to respond accurately. Also, they rated their confidence that the referent in each question had been present in the video on a scale ranging from *not confident at all that X was there* (1) to *perfectly confident that X was there* (5). The present study focuses exclusively on the data for structured recall.

De-induction procedures were then administered to those in the hypnosis condition while those in the waking condition completed the Betts' QMI. Subjects then completed the Gudjonsson Interrogative Suggestibility Scale (Gudjonsson, 1984, 1987). A brief post-experimental inquiry was then conducted to determine the emotional impact of the video and subjects' perceived level of hypnotic depth, hypnotic depth being rated on a six-point scale ranging from *not hypnotised at all* (1) through to *profoundly hypnotised* (6). Finally subjects were debriefed and asked not to discuss the experiment with anyone outside the laboratory.

RESULTS

Analysis of hypnotic depth scores ($t(160) = 4.95, p < .001$) indicated that subjects allocated to the hypnotic conditions experienced substantially more hypnotic involvement in the study ($M = 2.50, SD = 1.25$) than did subjects in the waking condition ($M = 1.67, SD = 0.83$). Depth scores thus validated prior classification of subjects on the hypnotic aptitude variable.

Acceptance of Suggestions

For all analyses of leading questions, subjects' responses were coded either "1" indicating acceptance of the suggestion inherent in the question, or "0" for all other responses. Scores for the questions suggesting false information were totalled for each subject, giving a minimum score of 0 and a maximum score of 1 for each of the two levels of cue-structure. Mean scores for each group are reported in Table 2. A 2 (high, low susceptibility) \times 2 (hypnosis, waking instruction) \times 2 (high, low cue-structure) ANOVA of false information accepted by subjects revealed a significant main effect for cue-structure, $F(1, 158) = 11.36, p < .001$. Subjects were more inclined to accept false information if the questions were of low ($M = 0.38, SD = 0.58$) rather than of high ($M = 0.20, SD = 0.44$) cue-structure. Consistent with the main hypothesis, there was also a significant effect for susceptibility, $F(1, 158) = 4.91, p < .028$, where high-susceptible subjects ($M = 0.36, SD = 0.37$) accepted more false suggestions than did low-susceptible subjects ($M = 0.23, SD = 0.39$). No main effects occurred for state instruction and there were no significant interaction effects.¹

Table 2 Mean Acceptance Scores for Questions Suggesting False Information

Level susceptibility	State instruction	Cue-structure	
		High	Low
High	Waking	0.13 (0.34) <i>N</i> = 40	0.43 (0.55) <i>N</i> = 40
	Hypnosis	0.35 (0.53) <i>N</i> = 40	0.53 (0.64) <i>N</i> = 40
Low	Waking	0.14 (0.42) <i>N</i> = 42	0.29 (0.55) <i>N</i> = 40
	Hypnosis	0.18 (0.45) <i>N</i> = 40	0.30 (0.56) <i>N</i> = 40

Note: Range = 0–2. Standard deviations are in parentheses.

An overall ANOVA analysis of all questions (see Table 3) taken together (maximum score = 4) revealed significant main effects for cue-structure ($F(1, 158) = 6.04, p < .015$), susceptibility level ($F(1, 158) = 7.67, p < .006$), and state instruction ($F(1, 158) = 6.32, p < .013$). All effects were in the predicted direction. Overall, subjects accepted more suggestions if they were high

Table 3 Mean Acceptance Scores for All Leading Questions

Level susceptibility	State instruction	Cue-structure	
		High	Low
High	Waking	0.85 (0.89) <i>N</i> = 40	1.03 (0.83) <i>N</i> = 40
	Hypnosis	1.43 (0.96) <i>N</i> = 40	1.30 (0.91) <i>N</i> = 40
Low	Waking	1.10 (0.88) <i>N</i> = 42	0.60 (0.77) <i>N</i> = 42
	Hypnosis	1.15 (0.83) <i>N</i> = 40	0.68 (0.83) <i>N</i> = 40

Note: Range = 0–4. Standard deviations are in parentheses.

($M = 1.15$, $SD = 0.69$), as opposed to low ($M = 0.88$, $SD = 0.58$) in susceptibility, if they were in the hypnosis ($M = 1.14$, $SD = 0.70$) versus in the waking ($M = 0.89$, $SD = 0.58$) condition, and if the questions were of high ($M = 1.13$, $SD = 0.91$) rather than low ($M = 0.90$, $SD = 0.88$) cue-structure. A significant interaction ($F(1, 158) = 7.41$, $p < .007$) between susceptibility and cue-structure occurred where high-susceptible subjects accepted more low cue-structure suggestions than did low-susceptible subjects.

Confidence of Responses to Suggestion

Similar analyses were conducted on subjects' ratings as to how confident they were about the presence of the referent in the stimulus material. For questions which falsely suggested the presence of objects or persons, a 2 (high, low susceptibility) \times 2 (hypnosis, waking instruction) \times 2 (high, low cue structure) ANOVA revealed significant main effects for cue-structure, $F(1, 157) = 18.26$, $p < .001$, where subjects were more confident on low-leading ($M = 1.85$, $SD = 0.83$) than on high-leading questions ($M = 1.55$, $SD = 0.68$); and for susceptibility, $F(1, 157) = 8.96$, $p < .003$, where high-susceptible subjects ($M = 1.85$, $SD = 0.61$) were more confident than low-susceptible subjects ($M = 1.56$, $SD = 0.59$). Mean scores for each group are listed in Table 4.²

Table 4 Mean Confidence Scores for Questions Suggesting False Information

Level susceptibility	State instruction	Cue-structure	
		High	Low
High	Waking	1.51 (0.62) $N = 40$	1.95 (0.82) $N = 40$
	Hypnosis	1.81 (0.79) $N = 39$	2.12 (0.92) $N = 39$
Low	Waking	1.41 (0.62) $N = 42$	1.67 (0.75) $N = 42$
	Hypnosis	1.50 (0.63) $N = 40$	1.69 (0.76) $N = 40$

Note: Maximum confidence score = 5. Standard deviations are in parentheses.³

Analysis for all confidence ratings taken together revealed main effects for susceptibility, $F(1, 156) = 11.71$, $p < .001$, where high-susceptible subjects ($M = 2.22$, $SD = 0.60$) were appreciably more confident overall than low-susceptible subjects ($M = 1.91$, $SD = 0.55$); and for cue structure, $F(1, 156) = 18.58$, $p < .001$, where subjects were overall more confident on high

($M = 2.21$, $SD = 0.80$) than on low ($M = 1.92$, $SD = 0.66$) cue-structure questions. Two significant interactions emerged. There was an interaction between susceptibility and cue-structure, $F(1, 156) = 5.24$, $p < .023$, where high-susceptible subjects were more confident than low-susceptible subjects on low cue-structure questions; and there was an interaction between level of susceptibility and state instruction, $F(1, 156) = 4.57$, $p < .034$, where in the hypnosis condition high-susceptible subjects were more confident than low-susceptible subjects. Mean scores for each group are listed in Table 5.

Table 5 Mean Confidence Scores for All Leading Questions

Level susceptibility	State instruction	Cue-structure	
		High	Low
High	Waking	2.03 (0.77) $N = 40$	2.05 (0.59) $N = 40$
	Hypnosis	2.55 (0.80) $N = 39$	2.25 (0.67) $N = 39$
Low	Waking	2.16 (0.80) $N = 42$	1.69 (0.65) $N = 42$
	Hypnosis	2.11 (0.76) $N = 39$	1.69 (0.58) $N = 39$

Note: Maximum confidence score = 5. Standard deviations are in parentheses.

Actual Distortion

The previous analyses addressed the issue of subjects accepting suggested information, regardless of its truth or falsity. It is relevant also to address the extent to which subjects erred, in fact. A major issue of debate in the hypnotic literature is whether hypnosis overall leads subjects towards actual memory distortion and this issue is addressed appropriately by looking to see whether hypnosis produces more error, compared with other test conditions. The majority of relevant studies have failed to reveal a significant or consistent accuracy effect for hypnosis (Putnam, 1979; Zelig & Beidleman, 1981); far more frequently memory distortion is reported as accompanying hypnosis (Orne, 1979; Orne, Soskis, Dinges, & Orne, 1984; Sheehan, 1988). This is testable in the present study and requires analysis of subjects' actual error scores.

Analyses of subjects' incorrect responses were conducted for false and correct questions separately, and for all questions taken together. All incorrect responses were coded "1" regardless of whether the suggestion was accepted. Any analysis of false questions would parallel exactly, of course, the previous analysis of

false suggestions accepted (see Table 2) — both indicated there was error. Analysis of correct scores provides the discriminating data.

A 2 (high, low susceptibility) \times 2 (hypnosis, waking instruction) \times 2 (high, low cue-structure) ANOVA of correct questions revealed a significant main effect for state, $F(1, 158) = 4.19, p < .042$, where hypnotised subjects ($M = 0.80, SD = 0.58$) made more errors (i.e., incorrectly rejected true information) than did waking subjects ($M = 0.65, SD = 0.48$). There was also a significant cue-structure effect, $F(1, 158) = 35.86, p < .001$, where subjects made more errors on high ($M = 1.06, SD = 0.73$) than on low cue-structure questions. There was also a significant interaction between susceptibility and cue-structure, $F(1, 158) = 8.89, p < .003$, showing that high-susceptible subjects made more errors than did low-susceptible subjects when the questions were of low cue-structure.

Analysis of all questions taken together revealed an overall cue-structure effect, $F(1, 154) = 51.47, p < .001$. Subjects made more errors if the questions were of low ($M = 1.87, SD = 0.84$) rather than of high cue-structure ($M = 1.26, SD = 0.79$). For items overall, no significant effects involving level of susceptibility or state instruction were observed.

Interrogative Suggestibility

Finally, subjects' interrogative suggestibility scores were analysed. The Gudjonsson Interrogative Suggestibility Scale yields a "recall score," indicating the amount of information a subject recalls; a "yield score" indicating the degree to which the subject accepts suggestions; and a "shift score" indicating the extent to which the subject will change his/her responses in response to negative feedback from the interrogator. An overall or "total suggestibility score" was calculated from the yield and shift scores. Separate 2 (high, low susceptibility) \times 2 (hypnotic, waking instruction) ANOVAs were conducted on all four scores, revealing significant main effects for susceptibility on both the "yield" ($F(1, 129) = 4.87, p < .029$), and the "total suggestibility" ($F(1, 129) = 4.17, p < .043$) variables. High-susceptible subjects showed higher ($M = 7.83, SD = 3.55$) total suggestibility scores than did low-susceptible subjects ($M = 6.64, SD = 3.14$). High-susceptible subjects ($M = 5.07, SD = 3.06$) also yielded to suggestions more than did low-susceptible subjects ($M = 4.01, SD = 2.46$).

DISCUSSION

The present study investigated the effects of response to leading questions where questions were varied in the extent to which particular answers were suggested. Data collectively illustrate the effects of suggestion and draw attention to important distinctions that appear not yet to have been made in the literature.

First, it seems clear that subjects may accept or not accept suggestions conveyed by leading questions; and state instruction and level of susceptibility are relevant parameters associated with effects. Second, from the analyses conducted of error scores there is less clearcut evidence that hypnosis instruction

and aptitude for trance are both associated with actual memory distortion — at least as far as leading questions are concerned. The evidence tells us that one needs carefully to distinguish acquiescence in acknowledging false information from actual responding in error. Accepting suggested information and memory distortion are processes that are distinct.

Results illustrated in Table 3 show that state instruction, level of susceptibility, and cue-structure all operate to determine subjects' acceptance of suggestions conveyed by leading questions. With respect to questions overall, the data indicated strong support for the main prediction under test in that all three main effects (state, susceptibility, and cue-structure) were in the hypothesised direction. More fine-grained analysis of effects for particular types of suggestions, however, showed that effects varied. Data for false suggestions, for instance, showed an effect for level of susceptibility but not state instruction, suggesting aptitude for trance was the more influential variable. This influence of aptitude was further illustrated by results obtained on the Interrogative Suggestibility Scale.

Results for state instruction and level of susceptibility are generally in accord with those reported in the experimental literature. From review of effects associated with memory distortion (see McConkey, Labelle, Bibb, & Bryant, 1990; Sheehan, 1988), it is apparent that stronger effects are frequently observed for level of susceptibility than for state instruction. In their analysis of effects of social context on the occurrence of pseudomemory, for example, McConkey and his associates demonstrated effects for level of susceptibility but not for state instruction. In the present study, as one might expect, high-susceptible subjects accepted more false suggestions overall than did low-susceptible subjects when they were conveyed by leading questions and, of course, made more errors when false suggestions were communicated. A related effect was associated with hypnotic-state instruction. Here, hypnotic subjects showed greater acceptance of suggested information overall than did waking subjects. But the effect for state instruction did not occur when leading questions specifically conveyed incorrect information. The design of the present study allows one to conclude therefore that overall acquiescence to suggested information conveyed by leading questions may characterise hypnotic instruction, and hypnotic test procedures do yield appreciable distortion effects, but effects are more characteristic perhaps of high (versus low) susceptible subjects than of hypnosis, *per se*.

The results for cue-structure are clearly the most anomalous in the study and require special comment. These data indicate that in reporting effects, one clearly needs to take into account the nature of the suggestion being conveyed. In particular, where false information was suggested it was low rather than high cue-structure that was associated with the greater acceptance of suggested information, even though over all items the predicted effect for cue-structure was obtained. The relevance of low cue-structure emerged also in the analysis of error scores, where the main effect observed over all questions

indicated more errors if questions were of low rather than of high cue-structure. The effects observed for cue-structure, then, despite the improved construction of the leading questions themselves, illustrated a reversal of effects for cue-structure from what was expected. Data suggest a hidden parameter at work, or at least an implicit factor that needs to be investigated further. That parameter may well be confidence.

Confidence data (see Tables 4 and 5) illustrate an influence that could explain the unexpected cue-structure effect and provide valuable leads to future research. Close observation of the confidence data shown in Table 4 indicates that the low cue-structure associated with false items of information was routinely accompanied by higher confidence in responses being correct. When all questions are considered, however, Table 5 shows that confidence was generally higher for high versus low cue-structure items. In Table 5, where total scores absorb effects for true and false items of information, confidence in responses to low cue-structure questions was generally lower than it was to high cue-structure items, and high cue-structure, as expected, then operated as predicted. In other words, where confidence was higher, results showed the expected cue-structure effect. The pattern of data overall suggests that confidence is a key parameter in determining acceptance of false information. In order to investigate the effect of cue-structure per se, then, future work should attempt to vary cue-structure, while attempting to hold confidence relatively stable. It appears that observed effects may well relate to the influence of subjects' conviction rather more than the structural properties of the questions that subjects are asked.

Conclusion

Overall, results from the present study confirm that the nature of suggestions conveyed by leading questions creates quite specific effects. It seems necessary to distinguish, however, the process of acquiescing to, or accepting suggestions, from the possible effects suggestions may have in creating actual memory distortion. Data collectively indicate that level of susceptibility is somewhat more influential than hypnotic instruction in determining acceptance of false information that is cued by leading questions. The conviction of subjects that they are correct, however, appears to be a powerful co-determinant of effects that yet remains to be researched.

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- ¹ Comparable analyses were also conducted for items suggesting correct information. Analysis showed a significant effect for cue-structure, $F(1, 158) = 35.3, p < .001$, where subjects accepted more true information if the questions were of high ($M = 0.93, SD = 0.72$) rather than of low cue-structure ($M = 0.51, SD = 0.63$). The main effect for state instruction approached significance, $F(1, 158) = 3.88, p < .051$, indicating that hypnotised subjects ($M = 0.80, SD = 0.52$) tended to accept more suggestions than did waking subjects ($M = 0.65, SD = 0.48$). Finally, the interaction between susceptibility and cue-structure, $F(1, 158) = 8.49, p < .004$, was significant and showed that high-susceptible subjects accepted suggestions more than did low-susceptible subjects on low cue-structure questions.
- ² Analysis of confidence ratings for items that correctly suggested the presence of the referent showed significant main effects for susceptibility, $F(1, 157) = 6.39, p < .012$, where high-susceptible subjects ($M = 2.60, SD = 0.94$) were more confident than low-susceptible subjects ($M = 2.27, SD = 0.74$); and for cue-structure, $F(1, 157) = 61.02, p < .001$, where high cue-structure questions ($M = 2.86, SD = 1.28$) led to greater confidence than did low cue-structure questions ($M = 2.00, SD = 0.90$). Two significant interactions emerged. There was an interaction between susceptibility and state instruction, $F(1, 157) = 5.13, p < .025$, where high-susceptible subjects were more confident than lows in the hypnosis conditions, and there was an interaction between susceptibility and cue-structure, $F(1, 157) = 4.38, p < .038$, where high-susceptible subjects were more confident than low susceptible subjects on low cue-structure questions.
- ³ Subject numbers per condition differ in Tables 4 and 5 due to the incomplete responses to the confidence request of one high- and of one low-susceptible subject in the hypnosis condition. Data for these subjects were excluded from the analysis of confidence responses.

HYPNOSIS — THE HEALER WITHIN*

Wendy-Louise Walker

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The first Manny Bernstien Memorial Address considers the role of the altered state of consciousness of hypnosis in contributing to outcome of therapy. Some of the important phenomena are outlined and their therapeutic uses described.

Mrs Bernstien, Mr Allen, ladies and gentlemen. I had the privilege of meeting Manny in the early years of my involvement in hypnosis. It is, then, with affection and respect that I offer this address.

Hypnosis — The Healer Within. Brian asked me to speak on that topic and, after I had done appropriate mental gymnastics to accommodate, believing it must have some profound significance, I found that it was simply one that had popped into his mind. Nevertheless, in organising my thoughts around that topic, I became increasingly enchanted with it.

Hypnosis — the healer within. Is the healer the hypnotist (many hypnotists I know consider themselves almost as gurus); or is it the patient, who heals him/herself? Is hypnosis itself central to the accelerated healing that often results in this triad, that altered state of consciousness different from waking yet not like sleep, where one becomes lost in experience, atypically responsive to suggestion, relaxed and yet vividly involved? I thought about this in moments of reverie over many busy weeks, let the thoughts percolate — and here is the result.

The healing effects of hypnotherapy, often quicker and less painful than other therapies, come from an interaction between the three: hypnotist, patient, and the state of hypnosis itself. But hypnosis itself is the mystery and it is on hypnosis that I will focus most, first asking when hypnosis began and what it is.

Trance states, altered states of consciousness, have been produced on purpose for healing as far back as recorded history goes, and this often took place in the context of religion or spirituality. However, hypnosis as we know it,

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an altered state of consciousness produced in the context of a special social interaction, is usually identified as beginning with the charismatic and dominant Franz Anton Mesmer in France just before heads started to roll in the French Revolution.

Let me give you the briefest outline, so it will be clear why hypnosis has been the centre of controversy and misunderstanding since its inception — a great yarn! Don't confuse Mesmer with the fictional villain Svengali. Anton Mesmer was an on-the-level and properly qualified physician, practising medicine in Europe from the late 1770s. Mesmer was aware of the work of two rather neurotic priests, Father Gassner (who was into producing curative convulsions in the process of exorcism) and Father Hell (who was enthusiastic about the curative properties of magnetism), and these notions fused themselves creatively in his mind into a curative method which became very popular and very controversial. Mesmer combined the notions of curative convulsive crises (hysterical fits) and the curative properties of magnetism, but this time *animal* magnetism. When he moved from Vienna to Paris in 1778, the higher classes flocked to him, being stressed out with the unrest preceding the revolution — a bad time to live for the upper classes in France. What he did was actually group hypnosis. He was a dominant, confident, and charismatic man who worked with dramatic phenomena in a rather theatrical setting, but there is no question that many of his patients, especially those with psychosomatic disorders, benefited greatly from his treatment. He trained many disciples (at a hefty profit) and had very influential patrons. Leopold Mozart composed music for his salon, to be played on the haunting glass harmonica, and little Wolfie himself played the instrument and later composed for it. Such flamboyance and success, then as now, provoked a great deal of hostility and Mesmer and his disciples caused such a stir in the more orthodox medical circles that King Louis XVI was persuaded to set up an investigation. There resulted not one but two Royal Commissions — nothing changes, does it? One was run by the Academy of Sciences, was led by none other than Benjamin Franklin, and comprised such famous scientists as Bailly and Lavoisier (both of whom were to lose their heads in the revolution a little later). This commission investigated very narrow hypotheses with exemplary rigour, focusing mainly on the question: "Is the concept of animal magnetism tenable?" — this being the central explanatory concept of Mesmer's theory. They found, of course, that it was not, but they did not go on to investigate the cures which they observed and documented from Mesmer's methods. They simply noted *en passant* that these were the result of touch, imagination, and imitation. They recommended against Mesmer's clinical methods, asserting (without any basis in documented fact) that: (a) they were dangerous to health, and (b) there was a problem of imitation. There began the scepticism and the bad name and sleazy connotations of hypnosis. There also began a tradition for scientific investigation in the area of hypnosis, which has changed only recently, for subtle and exemplary

methodology in the context of terms of reference so narrow that the research is of very limited value.

The second Royal Commission was run by the Royal Society of Medicine. This commission comprised famous medical people of the time in Paris and it handed down its report five days after the Franklin Royal Commission. This commission was rather more credulous than the Franklin one. It focused more on the cures, but the commissioners saw dangers in Mesmer's methods along the same general lines as Franklin et al. The cures, they said dismissively, resulted from hope, regular exercise, and (wait for this) abstinence from former remedies! None so blind as those who will not see. Neither Royal Commission paid attention to the very real cures of very real suffering brought about by these strange techniques or by interpersonal ritual and manipulation of expectancies and experience (i.e., by experience, by mental means), even though both Royal Commissions recognised some of the important psychological variables involved.

We will not fall into the commissioners' error, though, like them, we will note that many people are helped, often dramatically, by the production of an altered state of consciousness by interpersonal ritual. Areas where a proportion of sufferers are helped by hypnosis include psychosomatic and stress-anxiety-panic related symptoms and illnesses; pain, acute and chronic; dermatological conditions. Processes of psychotherapy may be accelerated by the use of hypnosis, with accelerated recognition and recall of damaging earlier traumas and accelerated learning of more effective coping skills. As in the times of Mesmer and his followers, we find that only certain disorders are amenable to help with hypnotic techniques; that certain patients are actually made worse; and that a proportion of people are quite un hypnotisable, more somewhat hypnotisable, and 1 or 2 in 20 (the proportions have been reported as much the same down the centuries) are exceedingly responsive to the hypnotic ritual.

Accepting then that this strange ritual is useful therapeutically to a proportion of people, and aware these days of some of the interfaces through which the mind and body interact, let us ask what is this state of consciousness with its potential uses in mental and physical healing processes, this hypnosis with all its theatrical connotations, with its distorted representation in fiction and the media and its unfortunate and inaccurate caricaturing by stage hypnotists? What is this hypnosis?

Hypnosis is an altered state of consciousness produced in the context of a very special interpersonal contract and transaction where one (the subject) gives over to the other (the hypnotist) the atypical trust of directing his/her stream of consciousness. With subjects who are hypnotisable, the changes brought about in consciousness are complex and fascinating. The subject is instructed directly or obliquely to move into what we might call passive receptive consciousness, to follow the suggestions and just let things roll along without being critical, without self-watching, without trying. The subject is urged

repetitively, even monotonously, to ignore extraneous things and his/her own random thoughts, to narrow the focus of attention, and to concentrate just on the hypnotist's suggestions and on the experiences these suggestions produce. This part of the hypnotic session, the so-called hypnotic induction, goes on and on, often with the subject experiencing a sense of the suggestions producing experience without any active volition on his/her part. After a variable time the instructions or suggestions will include eye-closure (spontaneous or voluntary), since the essence of hypnosis is its focus on inner experience and it is facilitated by concentrating with the eyes closed; it also feels more natural and comfortable, although excellent subjects can go into hypnosis with their eyes open. As long as it involves the important components of instructions just to let things flow along, of narrowing attention, of change in consciousness (and frequently of physical relaxation), and implicitly or explicitly of letting the hypnotist direct the focus and content of consciousness, the hypnotic induction stage can be quite varied and does not have to involve looking at a spot on the wall or hand levitation.

And when you get into this interesting state that is not like sleep but is so different from waking, what is it like? Well it is a bit like being immersed in a very vivid daydream to the exclusion of external reality; it is a bit like being so lost in reading a novel that grips you, like science fiction, that you forget about the world around and even forget about yourself and reality becomes what you construct as you read the book. In fact, people who in everyday life tend to get very absorbed in such activities and to lose themselves in them, are the kinds of people who are very susceptible to hypnosis. Another feature which is related to hypnotisability is the capacity to run two tracks of consciousness at the same time, to keep writing a letter while talking on the phone, to drive from one place to another so involved in rehearsing what you will say to someone that you are not able to remember the precise route you drove from A to B.

So going into hypnosis, following the hypnotist's suggestions, you become absorbed in what you are told to do and experience and as you go further into hypnosis you may even lose awareness of your own body and the outside world. Your attention is different from in the waking state, it just goes on and on in the directions suggested without skipping back and forward, to the outside world then to inner experience, as it does typically when we are in the waking state. In hypnosis, a number of the important controls of consciousness have been partly suspended as a result of complying with the hypnotist's suggestions and these include critical self-awareness (the self-monitoring which is an accompaniment of normal waking) and vigilant monitoring of the outside world (you assume as part of the contract that the hypnotist will do that for both of you for a time!). You give up active computing for meaning, you give up those abstracting, comparing and interpreting functions of waking consciousness; the hypnotist's words come to be taken quite literally. If imagery is suggested, it tends to be much more

vivid and subjectively real than in the waking state. Input like music is marvellously absorbing and may produce very vivid sensory imagery, visual or in other sensory modalities like movement. As you get more and more involved in the experience of hypnosis, your sense of self fades or, as the psychoanalysts say, the ego boundaries become blurred.

Going into hypnosis is typically accompanied by the relaxation response, an harmonious combination of mental quiet and physical relaxation, accompanied by slowing of heartrate, lowering of blood pressure, and beneficial changes in the body's biochemistry. Emotions, strong and not damped down by our use of logical intellectual processes, are easily switched on and off in hypnosis, either by imagined experiences or simply in response to the name of the emotion. Memories usually not able to be accessed in the waking state may be called up if the hypnotist makes up the right kinds of "search" instructions for you, or they may pop into mind spontaneously. You may experience as automatic physical sensations and actions that are usually voluntary. You may experience your hand as cold or hot; or your arm, in response to suggestion, may feel so light that it lifts up into the air, apparently spontaneously. You will lose awareness of the passage of time, since you are not paying attention to the cues that allow us to compute time. If the hypnotist suggests that you do something normally abhorrent to you, you will not be under his/her control as poor Trilby was controlled by Svengali, and you will likely either return to the normal waking state with an unpleasant jolt or get upset in hypnosis. However, although the hypnotist cannot control you in this crude manner, he or she will have far more influence than anyone would in the normal waking state, as in hypnosis we become more suggestible; we tend to do what is suggested as long as it is not abhorrent to us and we tend to take evaluative comments into our picture of ourself — and these suggestions may stay with us in the waking state.

The hypnotist makes us a pathway back to the waking state, by methods like counting backwards with the accompanying suggestion that we will return to the normal waking state and it feels more pleasant if this pathway back takes some little time. Very few people, even highly hypnotisable ones, have spontaneous amnesia for their hypnotic experiences, though this can happen. It is usual to remember, often as one remembers a dream, though there may be some difficulty in remembering the precise time sequence of the hypnotic experiences. Talking about them straight afterwards locks them securely into retrievable memory.

Even from this simple description of some of the phenomena of hypnosis, one can realise that here is a potential treasure-trove for change and healing. If the patient and therapist collaborate creatively, here is a situation where a range of experiences can be readily produced, almost as vivid as if they were occurring in the real world. Great therapeutic use can be made of this. You can use the increased capacity to imagine vividly and to experience powerful emotion to learn and rehearse new ways of responding, in behaviour and

emotion, with the increased suggestibility meaning that you can react as the therapist defines rather than in your old, maladaptive ways. This kind of imaginal rehearsal is a powerful technique for rapid learning and is very useful in a wide range of problems, from people crippled by long-standing neuroses to otherwise well-adjusted young people stressed out by the HSC (as I find at this time each year!).

The capacity for involvement and uninhibited loss of self in experience also means that frightened, stressed, and sad people can experience a range of feelings they had almost forgotten. Just going into hypnosis with a competent and properly trained therapist can in itself be relaxing, delightful, hope-restoring, and afterwards there is a lovely, centred, calm, light feeling that typically lasts for many hours. Further, one is atypically responsive to input, be it positive suggestions or exquisite music, and this can have the effect of changing one's perspective on oneself, life, the universe, and everything.

For those who cannot access old, dreadful memories and their attached feelings for working through in psychotherapy, hypnosis, properly and prudently carried out, can bypass many months of heavy slogging in psychotherapy. Or, again carried out by an expert, hypnosis can be an important ingredient in minimising and reversing post-traumatic stress reactions which we are now recognising as a real health hazard in a dangerous and violent world.

For those seriously ill, suffering cancer or HIV, or even dying, hypnosis carried out by an expert can promote feelings in the range of serenity, or more relevant peace and joy, and happy, enthusiastic determination, all of which have powerful effects on lifting immune function which can slow the development of terminal illness or even (just possibly) reverse it. Even for the terminally ill, hypnosis can produce changes in mental functioning which illuminate the last months, weeks, and days and, instead of being dulled by heavy tranquilisers, the dying person can squeeze every bit of significance, joy, and love out of the time left. This is an incredible boon, not just to the dying patient, but also to the family members who will be left behind. Working in this area, with dying patients and their families, has been one of the most inspiring and uplifting aspects of my clinical practice.

Hypnosis is not a panacea. It is a treatment modality which must be used in the context of a therapeutic relationship and plan. It is not a complete treatment in its own right. It must be tailored to the needs of the individual and so should only be carried out after careful and detailed assessment of the patient's strengths and vulnerabilities, and also tastes and values, hopes and fears, understandings and misunderstandings.

Not all people are able to enter hypnosis and the ability to be hypnotised is probably developed by life experience but based on an hereditary capacity for a particular sort of mental processing (just as verbal fluency and mathematical ability can be developed but are based on inherited patterns of ability). A competent practitioner must check if a patient is hypnotically responsive; you do not pay to be exposed mindlessly to a failure experience

when you have gone for help. In this context, it is interesting to note that hypnotisability is not higher in women than men; is not related to whether or not you are dependent and compliant; neurotic people are not more or less hypnotisable than non-neurotic ones. Hypnotisability is not related to any particular personality traits, like dominance-submission.

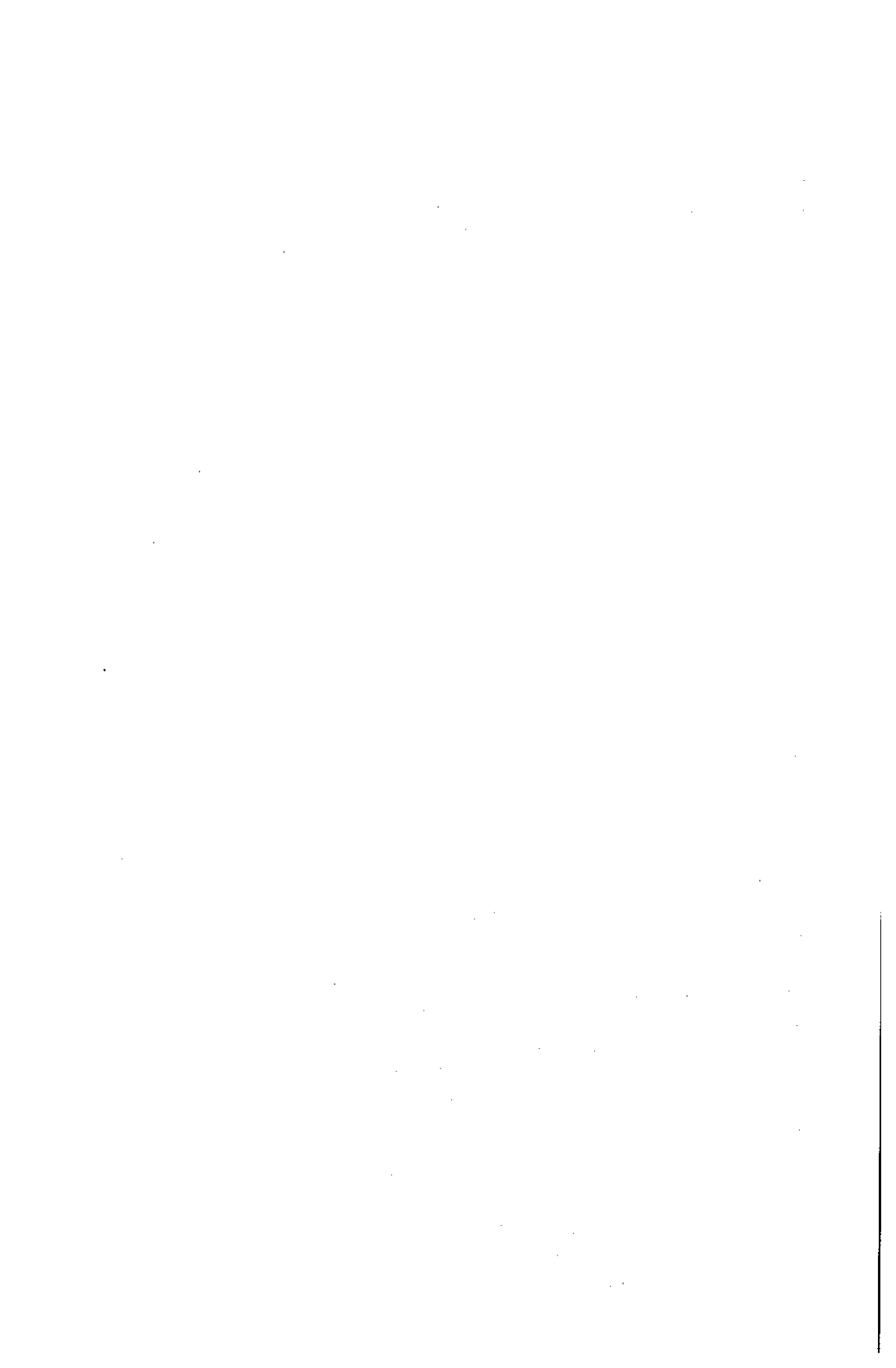
People with certain kinds of problems should not be hypnotised, and this includes people with major depressive illnesses (where medication is the cornerstone of treatment), people who are so-called borderline personalities, people who are actively psychotic, and people who are strongly paranoid, *inter alia*.

We return to our original triangle and refocus on roles in healing. The hypnotist, the guide, the educator, the catalyst, is the person whose instructions open up this marvellous state of consciousness with its potential for healing. The pathway out of ordinary waking consciousness must be safe and the guide must be competent; in therapeutic uses of hypnosis there is no place for sorcerer's apprentices who can induce hypnosis but do not know what to do then. Going into hypnosis, with many of the executive controls of consciousness lifted, allows for adjustment of the major programs of the mind but it also allows for incompetent operators to cause damage. When a technique is powerful enough to do good, one can safely guess it can also be misused. This is the case. Therefore the hypnotist must be a registered professional, properly trained; in the Australian Society of Hypnosis and in the registration acts of some states of Australia, hypnosis must be used only by doctors, psychologists, and dentists properly trained in hypnosis.

For the patient, he or she needs to bring a willingness to communicate and collaborate, so that the hypnotist can be an effective and safe guide into the altered state of consciousness. Openness and queries are important. If one has fears or doubts, these should be discussed. The patient also brings a level of hypnotic responsiveness which is not within his or her control.

The depth of hypnosis achieved between hypnotist and patient will depend on their collaborator and the hypnotisability of the patient. However, even at very light depths, one can get the relaxation response and the patient can learn to produce this at will, for example in response to an image of dropping a small white feather and imagining it falling lightly to the ground (or any other congenial image). This can have profound effects on physical and emotional conditions. If the patient is highly hypnotisable, then a good working depth of hypnosis can be achieved and this can speed up the changing of old habits of reaction and the establishment of more effective coping styles.

There is no longer any reason to hold to outdated, stereotyped beliefs about hypnosis and the changes in consciousness it involves. Decades of high quality research have established this. The hypnotic ritual takes one to much the same state of consciousness as does meditation, but more quickly and reliably for most people, with the added advantage of a guide and helper to direct experience and keep it constructive and safe. In terms of quality of the experience of hypnosis, it has healing qualities in its own right. It is one of the miracles of the infinitely complex human mind.



HYPNOSIS IN A GENERAL PAEDIATRIC HOSPITAL SETTING

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Based on the author's experience as a visiting medical officer specialising in hypnotherapy with children, this paper offers guidelines for the use of hypnosis in a children's hospital in emergency and non-emergency situations and provides illustrative case vignettes.

It is most unusual for a position to be created within a teaching hospital specifically for a visiting medical officer to practise hypnotherapy. Such an appointment was made at the Adelaide Children's Hospital in South Australia in 1989. In 1986 the South Australian branch of the Australian Society of Hypnosis initiated discussions with department heads and the chief administrative officer at the Adelaide Children's Hospital with the intention of establishing such a position. The Australian Society of Hypnosis is, of course, a national body whose membership is limited to doctors, psychologists, and dentists, with full membership possible only by examination following a two-year part-time training course. The society believes that hypnosis should only be practised by fully qualified health professionals. In 1989, applications were invited for the position of visiting medical officer in hypnotherapy in the Department of Medicine at the Adelaide Children's Hospital. I was appointed to conduct one session per week as senior visiting medical officer, Department of Medicine (Hypnotherapy) and began my duties early in 1990. A consulting room was made available in the Department of Psychiatry. This was done for two primary reasons. First, even though we deal with many medical and physical complaints, the modality of hypnosis is essentially a psychological approach. Second, it was felt that the Department of Psychiatry would provide the most consistently quiet area in the hospital in which to work. Most of the time this has proven to be so. I have found this department a most congenial place in which to work, and have received total cooperation from all staff members, in both therapeutic and administrative areas. Based on my experience in the role, I offer the following guidelines.

GUIDELINES FOR THE USE OF HYPNOSIS IN A CHILDREN'S HOSPITAL

1. Hypnosis should only be used by qualified medical practitioners, psychologists, and dentists who have adequate additional training in the principles and practice of hypnosis.
2. Hypnotherapy should be regarded in most cases as adjunctive to additional medical treatment, and can be used to augment and enhance the efficiency of these methods.
3. Hypnotherapy is not a panacea or miracle cure treatment. It takes time, like most other therapeutic techniques, and a number of treatment sessions is generally necessary.
4. Occasionally very rapid one- or two-session cures do occur where other methods have failed, and hypnosis can frequently be used very effectively in emergency situations, in particular to control pain and anxiety.
5. Hypnotherapy is the treatment of choice for some conditions in children, and should be considered as part of the management in the early stages of many other conditions.
6. For hypnosis to be used effectively, two ingredients are essential on the part of the therapist: first, a good clinical understanding of the conditions to be treated, and, second, high quality training and experience in hypnosis.
7. Children in general respond well to hypnosis and hypnotic procedures, providing certain criteria are fulfilled. These are:
 - (a) Motivation and cooperation on the part of the patient, confidence and trust in the therapist, and good rapport and positive transference between patient and therapist.
 - (b) Imagination, probably the most important prerequisite for successful hypnotherapy with children, must be used constructively and flexibly by both patient and therapist.
 - (c) The treatment process must be non-threatening to the child, with the feeling that patient and therapist are engaged in a joint venture designed to teach the child how to achieve self-mastery and mastery over the way he/she feels and reacts.
8. When hypnotherapy is being used as part of a treatment plan, all other staff involved in the care of the child should be made aware of this and of how they can help maximise the beneficial effects of the hypnosis. This applies particularly to nursing staff, who are involved in the ongoing treatment of hospital inpatients.
9. Hospital staff should be informed of the indications for and the benefits of hypnosis. This can be done by lectures, demonstrations, videotapes, and by personal discussion. In fact all of these avenues have been utilised during the last two years.

INDICATIONS FOR THE USE OF HYPNOSIS WITH CHILDREN

Children have a special talent for hypnosis. Hypnosis with children involves the nurturing and utilisation of the particular talents children have to become involved in fantasy and imagination, to the point where the boundaries with reality become almost indiscernible. Their capacity to learn how to exercise and gain internal control over their own physical and emotional responses, their curiosity, their willingness to learn and to have new experiences, and their desire for self-mastery make them particularly willing and receptive subjects.

In general terms the indications for the use of hypnosis in children can be divided into emergencies and non-emergencies.

Emergencies

These generally involve situations requiring control of pain, fear, and anxiety, such as accident cases needing minor surgery or burns victims. The latter can also be helped in the later stages to encourage tissue healing and in potentially painful situations such as dressing changes.

Non-Emergencies

These include the following areas:

Oncology. Pain control and the side effects of chemo- and radiotherapy, such as anxiety, nausea, and vomiting, both anticipatory and post-therapy, and the pain and anxiety associated with repeated diagnostic or therapeutic procedures, such as intravenous or intramuscular injections, spinal taps and bone marrow punctures.

Medical and Dermatological Problems. Hypnotherapy has been successfully used in the management of bronchial asthma, warts, skin conditions associated with irritation and scratching, migraine and other headaches, tics and habit spasms, hiccups, cyclical vomiting, dysmenorrhoea, urinary retention, Tourette's Syndrome, enuresis, and encopresis.

Surgery and Anaesthesia. Pre-operative preparation and control of post-operative nausea and vomiting, pain and anxiety, improvement in appetite. There is also evidence to show the post-operative healing process can be enhanced through the use of hypnosis in some cases.

Urology, Enuresis, Urinary Retention. Dialysis patients with anxiety or needle phobia, and indeed any conditions in which repeated painful procedures are necessary, such as children requiring frequent injections or intravenous infusions.

Psychiatry. Anxiety states, phobias, conversion reactions, psychogenic seizures, sleep disorders, nightmares, night terrors, school refusal, learning difficulties, behaviour disorders, sleepwalking.

Habit Disorders. Tics and tremors, nail-biting, thumb-sucking, hair-pulling, psychogenic cough. Hypnosis can also be used very effectively in dental work

with children in areas of anxiety and pain control. This list is by no means complete.

Referral Sources and Procedure. Patients are currently referred either through the Department of Psychiatry or directly to me, and patients can either be seen as out-patients or in-patients.

Which Children Will Respond to Hypnosis? Although the hypnotic capacity in adults shows considerable variation through the population, children are uniformly much more responsive and hypnosis can be used from about the age of seven upwards on practically all children, and using somewhat different techniques these methods can be used sometimes with children as young as five or even four years of age. All children who are capable of learning are taught self-hypnosis and shown how to use these self-control techniques. It is very important to include parents in the children's program, and to discuss fully with them precisely how hypnosis is used with children and to deal with common myths and misconceptions which many adults still hold about hypnosis.

Because of the nature of the current appointment it has not been possible to deal with many emergency cases, as by the time the therapist is contacted the emergency has been dealt with. This highlights the value of having resident medical staff trained in hypnotic techniques and available to use them when the need arises.

Hypnosis is in fact being introduced into the medical curriculum in a number of medical schools throughout Australia, and it is envisaged that the time will arrive when medical students will be trained and able to use these techniques by the time they graduate. At present the Australian Society of Hypnosis diploma is a postgraduate qualification. There is still a great deal of ignorance and misunderstanding about the nature of hypnosis and the ways in which it is used in medicine.

It needs to be appreciated that hypnosis is in fact a natural state, and occurs frequently in everyday life, particularly with children. It is a state in which there are varying degrees of physical relaxation, a heightened response to suggestion, and in which alterations in perception and memory can be induced. Being a completely natural state, hypnosis per se is completely devoid of side effects. However, it is the way in which the hypnotic state is utilised by the therapist which is important, and without proper training hypnotists can occasionally induce untoward side effects.

CASE VIGNETTES

Case One

When first seen Paul was aged 12 and had begun a regime of renal dialysis three times a week as a result of chronic renal failure. He had developed an intense dislike of spending some 10 hours a week in the hospital, and had also become quite phobic about the necessary injections associated with the

dialysis. He had also developed considerable anxiety associated with the whole procedure, to the point where it was becoming increasingly difficult to get him to the hospital for his treatment. Paul was first seen with his parents, and some time was spent establishing rapport, assessing Paul's intellectual capacity, and generally establishing a positive relationship. The first hypnotic induction was conducted in the presence of his parents and involved a technique requiring the focusing of visual attention for long enough to shift his locus of control from conscious to unconscious. Hypnosis essentially involves a far more direct communication with the unconscious mind, which is generally described to the patient as the deep part of the mind or the inner mind which controls their feelings and behaviour. In the younger child, of course, it is not necessary to mention the word hypnosis, although most of them have had some exposure to this via television and films. Their impressions of what it is all about are always distorted by such exposure. Following the induction of hypnosis, Paul was shown how to block painful sensations in his hand and a 23-gauge needle was duly inserted with no discomfort whatever. Upon removal of the needle Paul was able to control any bleeding, which is another well-known hypnotic response. Paul was then taught how to induce the hypnotic state himself at will, and how to exercise his pain-control techniques when he needed to, such as during the renal dialysis. Suggestions were also implanted designed to control anxiety and have him perceive the hospital and the treatment as his friends and allies, and something he would perceive in a very positive way. A tape-recording was also made which induced the state of hypnosis and delivered many positive suggestions along the lines mentioned above. At his next dialysis treatment Paul was able to use these techniques to quite comfortably tolerate an injection of local anaesthetic prior to the insertion of the intravenous cannula, then a little later to dispense with the local altogether. Other techniques were used, such as time distortion, which enabled him to perceive the time spent in dialysis as much shorter than it really was. Twelve months later, Paul continues to have regular dialysis with no problems. We were fortunate enough to be able to videotape some of Paul's hypnosis and treatment sessions, and this has formed part of a video program on the use of hypnosis in children.

Case Two

Rebecca was seven years of age and referred by a senior consultant physician from the Adelaide Children's Hospital because of a very disturbing, distressing cough, which had persisted for one to two weeks and was resistant to treatment. All appropriate investigations had been conducted, and did not reveal any organic pathology. There was some evidence to suggest a mild upper respiratory tract infection, but certainly not enough to account for the rasping harsh cough. Apart from this symptom, Rebecca appeared to be in good health. A history revealed that Rebecca's mother was extremely ill with a malignant tumour, and although she had not been specifically told of the severity of

her mother's condition, Rebecca was well aware that she was very ill and was needing frequent medical attention. It was felt that there was nothing to be gained by looking too closely at the dynamics of the situation at this time and Rebecca, who proved to be responsive to hypnosis, was simply shown a technique by which she would be able to control the cough. After two sessions of hypnotherapy a few days apart the cough disappeared completely and had not returned several weeks later.

Case Three

Isabel, aged 11, was referred by the Department of Psychiatry because of difficulties in sleeping. Isabel would wake up during the night several times a week in a state of high anxiety, get out of bed, and insist on sleeping in her parents' room for the remainder of the night. This had been going on for many months now. Apart from this problem, Isabel was a completely normal, well-balanced young lady, who did well at school, had plenty of friends, and appeared to have no particular problems. There was nothing of any significance in the history to suggest a specific cause for her night-time anxieties, the only thing being that around the time they started her sister was accosted one day on a beach by a young man while Isabel was present, but it really seemed to be of no great significance then, as the young man desisted when asked to do so. Isabel was shown how to use self-hypnosis to give herself a safe feeling at night, as if she were with her parents and in a completely safe place. Over a period of some weeks, the night-time anxieties diminished and, although she still has occasional restless nights, she is very much better than when first seen.

Case Four

Ben, aged eight, was diagnosed with acute lymphatic leukaemia 12 months ago and was referred because he was unable to swallow the tablets which were part of his chemotherapy regime. The tablets had a very unpleasant taste, and when he did eventually manage to get them down they would come right back up again. Ben proved to have a good capacity for hypnosis and was shown how to change the taste of the tablets to something much more pleasant. He was also told that his swallowing muscles would relax at the right time, allowing the tablets to slide down and remain comfortably in his stomach. When seen three months later he had been managing the tablets with no trouble.

CONCLUDING COMMENT

It is to be hoped that more hospitals around the country will follow the lead of the Adelaide Children's Hospital and encourage the use of hypnosis in the management of a wide variety of symptoms and conditions in children.

LOGLINEAR ANALYSIS: BRIGHTER OR DIMMER AFTER THE PRIMER?

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This journal recently published a very helpful primer on loglinear analysis (Carlson, Green, & Lynn, 1991) designed to help those who are unfamiliar with the approach. It is argued here that, in its illustrative reanalysis of the data of previously published research, the primer contains several errors in model specification and that the section on interpretation of results is inadequate and sometimes misleading. Suggestions for more adequate interpretation are offered, along with a plea for another primer to address issues of interpretation more thoroughly.

The editor of this journal is to be congratulated for including a recent primer on loglinear analysis (Carlson, Green, & Lynn, 1991). This primer is especially valuable to those who may have completed their formal professional education some years ago without the advantage of having been introduced to the technique. Unless such relatively new and unfamiliar techniques are clearly explained to the practising clinician, important research articles using the technique may prove too daunting and thus inaccessible. Additionally, some researchers faced with the analysis of complex cross-classified data may also be delighted with the primer and stimulated to increase their grasp by consulting the more advanced references.

Carlson et al. (1991) convincingly demonstrate the advantages of loglinear models over multiple chi-square tests when there are interactions among three or more variables. The authors present sufficient introduction to loglinear analysis to enable the neophyte to read research reports in an intelligent way, and they provide concrete examples of application through the reanalysis of data in previously published reports (Green et al., 1990; Lynn, Weekes, & Milano, 1989) which had used only traditional chi-square methods.

Having sincerely expressed appreciation for the primer, this reader may now complain. He was not immediately enlightened — in fact his understanding of loglinear analysis grew dimmer as he attempted to work through the primer.

He then discovered that there are some serious mistakes in the descriptions of the models used in the main example. More importantly, there are also grave questions about the adequacy of the interpretation of the results following the reanalysis.

This brief article is designed, first, to correct the descriptions of the models in order to spare the new reader potential hours of frustration. A second aim is to encourage the authors of the primer, or other experts, to produce a second primer, focused this time upon *interpretation* of the interactions revealed by loglinear analysis.

DETAILS OF THE MAIN ILLUSTRATIVE EXAMPLE

The main example through which Carlson et al. (1991) teach the analysis and interpretation of interactions between three categorical variables is an interesting study by Lynn et al. (1989) which investigated aspects of pseudomemory. It will be useful to describe this study briefly. The design was a $2 \times 2 \times 2$ between-subjects factorial. The variables were group (G) consisting of hypnotisable or simulating subjects, telephone (T) with the levels of whether or not a telephone actually rang during the experiment, and suggestion (S) whether or not a suggestion was made that a telephone would ring during the experiment. The fourth variable, response (R), was determined by whether or not the subject reported hearing a real telephone ring during the session. In the original article these data had been analysed by means of chi-square methods on a series of classification tables. For the reanalysis the data are represented in a $2 \times 2 \times 2 \times 2$ cross-classification table and are subjected to loglinear analysis.

The Lynn et al. (1989) study examined the extent to which mundane perceptual abilities are compromised by suggestion. In operational terms, how well are subjects able to distinguish real external events (a telephone ringing) from suggested events (suggestion of a telephone ringing)? The authors also investigated the likelihood of pseudomemory for an event that was discrete, objective, and publicly verifiable (a telephone ring). It has been found that pseudomemory for such events occurs at a lower rate than more subjectively determined ones (McCann & Sheehan, 1988). The original analysis of results by chi-square methods showed that, with such an objective and publicly verifiable event, deeply hypnotised subjects experienced a very low rate of pseudomemory. The results also indicated that deeply hypnotisable subjects showed no impairment in comparison to simulating subjects in their ability to discriminate whether or not a real external event occurred during hypnosis (Lynn et al., 1989). It is unfortunate that the interpretation of the results by Carlson et al. (1991), following their reanalysis by loglinear methods, does not relate readily to the original aims of the investigation.

INTRODUCTION TO THIS CRITIQUE

In loglinear analysis the notation of a high-order interaction between variables, such as [GTS] implies all the lower-level terms involved. Thus, [GTS] implies

effects for $G \times T \times S$, $G \times T$, $G \times S$, $T \times S$, G , T , and S , although these effects are not all necessarily statistically significant. Model selection involves systematic decomposition and testing of the elements to remove any that do not appear to contribute importantly to the adequacy of the model. A successful model is one which adequately fits the data using the simplest combination of predictor variables.

It is important to note that in their reanalysis of the Lynn et al. (1989) study, Carlson et al. (1991) properly insist that the variables group, telephone, and suggestion, and all their interactions, appear in all the models to be considered. The [GTS] combination provides a fully saturated solution to the total number of responses made in each combination of the experimental conditions. The relationships between these variables [GTS] are not of much interest to the researchers because they themselves determined them in their allocation of subjects to conditions. What are interesting are the distributions of R associated with G , T , S , and their interactions.

CORRECTIONS OF THE MODEL SPECIFICATIONS

Carlson et al. (1991) list 19 loglinear models to be considered. Most important is M8, which turns out to be their favoured model. This model is stated only once in the article and the notation is wrong!

That their description of M8 is wrong can be demonstrated by examining the process of model decomposition. M8 was derived from the more complex earlier model [GTS][GTR][TSR] by removing the $G \times T \times R$ component only. As demonstrated by the authors, this can be done without producing a statistically inferior model. $G \times T \times R$ is a component implied in the notation [GTR]. Now [GTR] also implies $G \times T$, $G \times R$, $T \times R$, G , T , and R . Dropping only the $G \times T \times R$ requires that all the other terms in [GTR] must remain in the model. The $G \times T$, $T \times R$, G , T , and R components remain in the model through their inclusion within either [GTS] or [TSR] and thus the only other term unique to [GTR] is $G \times R$. Thus, when $G \times T \times R$ is dropped from [GTR], we are left with [GR] and the more complex model [GTS][GTR][TSR] becomes [GTS][TSR][GR], not [GTS][GSR][GR] as is stated for M8. This correction also makes sense of the Carlson et al. tests of effects and models, and their interpretations of results. Presumably the error in specification is only a typing error, but a very frustrating one for the reader. However, in good humour, the mistake was an excellent device for teaching the process of model decomposition. Two other mistakes of specification occur in the table which lists the other models. M12 is probably [GTS][GR][TR][SR] rather than [GTS][GR][PR][SR], and M16 is probably [GTS][TR] rather than [GTS][PR]. These last two may have resulted from using P for phone rather than T for telephone. Only with these corrections can the models be decomposed one effect at a time.

CRITIQUE OF THE INTERPRETATIONS OF THE FAVOURED MODEL

We come now to the interpretation of the best fitting model for the Lynn et al. (1989) data. If it be accepted that M8, [GTS][TSR][GR], is the best model, it then becomes necessary to interpret the effects included in the model. Carlson et al. (1991) focus their interpretation on the $G \times R$ and $T \times S \times R$ interactions. Their first conclusion, drawn from the $G \times R$ interaction (recall that this $G \times R$ interaction is the only unique component added to the model by the [GR] bracket), is that group is related to reports of a telephone ringing. The authors go on to explain that those in the simulating group were 3.45 times as likely to report that a telephone rang than were hypnotised subjects (p. 29). This ratio of 3.45 seems incorrect if it refers to the $G \times R$ cross-classification. For the purpose of this critique, the M8 model [GTS][TSR][GR] was run using an SPSS/PC hiloglinear procedure producing results very similar to those reported by Carlson et al. (1991). The resulting cross-classification table for the expected frequencies of G and R is shown in Table 1.

Table 1 Cross-Classification of the Expected Frequencies of the Group and Response Variables

	Report of real ring	Report of no real ring
Hypnotised group	21.1	35
Simulating group	25.9	18

Calculation of this odds ratio shows that the simulating group are only 2.4 times as likely to report that a telephone rang than the hypnotisable group. Either the authors have made a mistake in reporting the ratio, or they have judged that some other cross-classification is more appropriate. If it be the latter explanation, then a more detailed exposition would be illuminating.

Carlson et al.'s second conclusion from the results stems from the contribution of the [TSR] component to the model's efficiency. They say that "both the actual and suggested presence or absence of a telephone ringing are related to the presence or absence of a telephone ringing" (p. 29). This statement is incomprehensible unless the words "the report of" are inserted in the sentence immediately before the second "a telephone ringing." It is presumed that this is what was intended.

It is important to note that the [TSR] notation introduces into the model the components $T \times R$, $S \times R$, and $T \times S \times R$, which are not already included. The significant effect of [TSR] is due to the influence of these several components. If these components were being described in ANOVA terms, with R as the dependent variable, it would be said that there are possible main effects for T and S, and an interaction effect for $T \times S$. Carlson et al. focus their exposition on the effects of the $T \times S$ interaction on R. As they suggested, we examined the odds ratios between the S and R variables at each level of T. The expected values for these cross-classifications are shown in Table 2.

Table 2 Cross-Classifications of the Expected Frequencies of the Suggestion and Response Variables at Each Level of the Telephone Variable

The telephone actually rings		
	Report of real ring	Report of no real ring
Ring suggested	18	1
Ring not suggested	23	3
Telephone does not ring		
	Report of real ring	Report of no real ring
Ring suggested	1	26.9
Ring not suggested	5	22

Inspection of the data in Table 2 indicates that the $T \times S$ interaction obviously modifies a very strong main effect for T . When the phone actually rang, 91% of subjects reported a real ring, and only 9% could not remember a ring or believed the phenomenon was due merely to suggestion. In a complementary way, when the phone did not ring, 89% of subjects reported that the phone did not ring, with pseudomemory reported by only 6 subjects (11%). The reports were thus generally veridical.

Carlson et al. say: "When the telephone actually rang, subjects who were given a suggestion to hear the telephone ring were 2.70 times [our calculation 2.3 times] more likely to report that the telephone rang than were subjects who were not given the suggestion" (p. 29). This use of the odds ratio is frankly misleading because, of those who were not given the suggestion, no fewer than 89% reported a ring. To multiply this success rate by 2.7 for those who did receive the suggestion would result in the imputation of very good performance indeed! Would it not be better to state that: "When the telephone actually rang, 91% of subjects accurately reported a ring. Of the remainder, only 5.3% of those given a suggestion, but 11.5% of those not given a suggestion, reported that the telephone did not ring."

The authors go on to say: "when the telephone did not actually ring, subjects who were given a suggestion to hear the telephone ring were only 0.15 times as likely to report that the telephone rang than were subjects who were not given the suggestion." This statement appears to be mathematically reasonable, but would it not give a clearer picture to state that: "When the telephone did not actually ring, only 3.5% of subjects who were given the suggestion reported that a telephone rang, whereas 18.5% of those who were not given a suggestion reported a ring."

CONCLUDING REMARKS

Much of the above criticism rests upon the accurate description of models and the reporting of results. These may be dismissed simply as clerical errors, though they need to be corrected if the neophyte reader is to profit from

the primer without undue frustration. More fundamental is the need for clearer exposition of the interpretive process. Nests of high-order interaction effects are notoriously difficult to interpret and, given the availability of computerised statistical packages and the relative ease of churning out batches of statistics, the interpretive and critical capacities need to be nurtured. A second edition of the primer is due, from Carlson et al. or from other teachers, with focus on interpretation.

Much of the above discussion has focused upon the analysis of the results of a particular paper (Lynn et al., 1989). The paper is in itself intrinsically interesting but, more importantly, the specific data have been used to illustrate the general process and problems of analysis and interpretation. The detailed criticisms above ought not to be viewed as mere academic chaff-chopping, but as an attempt to engage in dialogue with a newly available and powerful statistical tool of obvious value to hypnosis research.

In their interpretation, Carlson et al. apparently chose to ignore the research questions addressed by Lynn et al. (1989) in their paper, and so in conclusion it will be interesting to examine whether the loglinear approach can shed light on these questions.

Lynn et al. investigated whether, with an objective and publicly verified event such as a real telephone ring, the rates of pseudomemory would be low. The very strong $T \times R$ interaction included in the model, with its associated frequencies and odds ratio, suggests that the memories of most subjects were accurate, with only 6 of 55 subjects (11%) of those who did not actually hear a telephone reporting that a telephone rang. Of these 6 subjects, only 1 had received a suggestion that a telephone rang; the reports of the other 5 had apparently been generated during the subsequent debriefing by a forced-choice question. Lynn et al. also sought to investigate whether normal, mundane perceptual abilities are compromised by suggestion such that subjects confuse fantasy with reality (p. 138). This involves comparison of the responses of those who received suggestion in the hypnotised and simulating groups. If perceptual abilities were compromised by suggestion during hypnosis, then the hypnosis group should be different from the simulating group, and this should therefore be reflected in a significant $G \times S \times R$ interaction. It would be expected that the hypnotisable group who received suggestion would have been more likely to confuse reality with fantasy, both when the telephone rang and when it did not ring, than would the simulating group. But this particular interaction was removed from the model at the second step with very little loss of prediction, supporting the view that most or all hypnotisable subjects retain the ability adequately to monitor reality. The loglinear analysis thus firmly supports the conclusions drawn by Lynn et al. (1989) and offers the confidence of a far more rigorous analysis than a series of chi-square calculations.

Dear editor, let there be a second primer, and may this primer remove the planks of wood from the eyes of this reader who has dared to criticise what are probably only specks of sawdust in the eyes of Carlson et al.

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