

The University of Manitoba

The Effect Of Stimulus Medium On
Forensic Hypnotic Hypermnesia

by

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DAVID K. JACKSON

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
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DOCTOR OF PHILOSOPHY

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Abstract

Previous research attempting to demonstrate the existence of enhanced recall (hypermnnesia) by hypnotic subjects in forensically-valid studies has been equivocal. Many methodological weaknesses and inconsistencies (including the use of differing stimulus media for the crime presentation) may account for the conflicting results in the research literature. The present study was the first to directly compare the effect of the stimulus medium on forensic hypnotic hypermnnesia. One hundred and one subjects scoring in the high or high-medium ranges on the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962) were matched for sex and level of hypnotizability, and were randomly assigned to one of three stimulus media conditions: 1) live enactment; 2) videotaped enactment; or 3) slide presentation. The videotape and slides were obtained by taping and photographing the live enactment of a fatal stabbing. Following the crime presentation, the subjects completed a questionnaire consisting of 23 cued recall (open-ended) questions concerning visual aspects of the event. One week later the subjects were exposed to an audiotaped questioning. Half of the subjects were hypnotized prior to the interrogation, and control subjects participated in an active relaxation exercise. At the second session, the subjects were asked the 23 questions previously posed, and an additional 6 misleading questions. They then performed two facial recognition tasks, in which they attempted to identify the perpetrators from an array of photographs. The hypnosis subjects did not exhibit hypermnnesia on the cued recall questions, and were misled more than control subjects on the

misleading questions. They also made less correct identifications and more incorrect identifications on the facial recognition tasks. Subjects who witnessed the live enactment tended to experience enhanced recall over their counterparts. Likewise, subjects in the video condition recalled more information than subjects in the slides condition. The live group reported greater arousal than the video and slides groups upon seeing the crime scene, but the difference in arousal did not significantly affect the subjects' recall. The implications of these results are discussed, and suggestions are made for future research.

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THE EFFECT OF STIMULUS MEDIUM ON FORENSIC HYPNOTIC HYPERMNESIA

Cicero (55 B.C.) believed that memory is "the treasury of all things." Some advocates of forensic hypnosis might be tempted to correct him and say that hypnotically refreshed memory is "the treasury of all things." Such advocates believe that hypnosis enhances memory for eyewitness identification and other information which can assist in the solving of crimes and convicting of offenders. The problem of eyewitness identification is illustrated by the common occurrence of watching a movie and asking the person with you, "is that the same man who" Just as we sometimes confuse different actors or actresses in the same movie, eyewitnesses and victims of crime are not always clear concerning the identity of offenders, nor the details of the crime which they witnessed. Hypnosis is sometimes used to enhance this type of recall.

An account of the earliest known use of hypnosis in the investigation of a crime in the United States was first published in 1845 (Gravitz,1983). In the latter part of the 19th. century, an extensive number of articles, books, case studies, and conferences were devoted to problems in the forensic use of hypnosis. The investigative utility of hypnosis and potential abuses were debated extensively (Laurence & Perry, 1983). Some felt that hypnosis leads to more information being recalled. Others argued that hypnosis leads to a greater number of errors in recall, increasing the

probability of an innocent person being accused, or even convicted of a crime.

In recent years, the debate concerning the alleged hypermnesic effect of hypnosis has intensified, as has the use of hypnosis by law enforcement organizations (Diamond, 1980; Laurence & Perry, 1983), and experimental research by social scientists. Los Angeles county alone has had up to 20 senior officers trained as hypnotists and 3 staff psychologists who conduct forensic hypnotic interrogations (Newsweek, 1981). The importance of hypnosis research has been stressed in a study by the Rand Corporation (1975), which concluded that the principle determinate of whether a forensic case is solved is the completeness and accuracy of the eyewitness data.

Hypnosis has been used for various purposes in the forensic context: 1) in the screening of potential jurors; 2) in investigating the mental state of an accused person; 3) in preparing witnesses for cross-examination by inducing relaxation; 4) to improve the process of remembering (Hayward & Ashworth, 1980); and 5) for interrogating murder suspects and other defendants (Brunn, 1968; Salzberg, 1977; Scott, 1978). Most North American researchers now agree that hypnosis should not be used with defendants, since incriminating evidence arising from the hypnotic interrogation would conflict with the defendant's rights (for example, the Fifth Amendment of the United States Constitution; Cohen, 1980). The most common uses of hypnosis by investigative agencies has been to "refresh" (improve) the memory of eyewitnesses to crime. However, the hypermnesic effect of hypnosis is a matter of debate, and opponents of forensic hypnosis point to a few potentially serious

problems, such as increased likelihood of fabrication and errors (Diamond, 1980; Dywan & Bowers, 1983; Orne, 1979), greater susceptibility to leading questions (Putnam, 1979a; Sanders & Simmons, 1983), and enhanced confidence of inaccurate memories (Sheehan & Tilden, 1986; Zelig & Beidleman, 1981). Concerns regarding these possible dangers have prompted the supreme courts of several states (e.g., California, Michigan, Minnesota, Arizona, Maryland, and Pennsylvania) to refuse to admit hypnotically-affected testimony (Smith, 1983).

The legal rule which applies to the admissibility of a scientific procedure is the Frye rule (Frye v. United States, 1923). This rule holds that a scientific procedure must be believed to be reliable by the relevant scientific community before it can be admitted into court. Accordingly, in the case of People v. Shirley, 1982, the judge ruled that hypnosis did not meet the requirements of the Frye rule, saying that "at the present time the use of hypnosis to restore the memory of a potential witness is not generally accepted as reliable by the relevant scientific community."

If hypnosis is to become a respected tool in police investigations or court proceedings, its ability to improve memory over the waking state, or to at least decrease the decay of memory, must be established beyond a reasonable doubt (Smith, 1983). The present study will address this issue.

Definitions

Defining hypnosis is not an easy task. Although many definitions and theories have been offered, no one definition or theory has gained unanimous support (Pinizzotto, 1989). Yet, most

researchers would agree with Hilgard's (1968) description of the characteristics of hypnosis in high hypnotizable subjects:

1. Subsidence of the planning function. The hypnotized subject loses initiative and lacks the desire to make and carry out plans of his own
2. Redistribution of attention (U)nder hypnosis selective attention and selective inattention go beyond the usual range
3. Availability of visual memories from the past, and heightened ability for fantasy-production
4. Reduction in reality testing and a tolerance for persistent reality distortion Reality distortions of all kinds, including acceptance of falsified memories . . . and all manner of other unrealistic distortions can be accepted without criticism within the hypnotic state.
5. Increased suggestibility.
6. Role behavior. The suggestions that a subject in hypnosis will accept are not limited to specific acts or perceptions; he will, indeed, adopt a suggested role and carry on complex activities corresponding to that role.
7. Amnesia for what transpired within the hypnotic state (Amnesia) is not an essential aspect of hypnosis Yet it is a very common phenomenon, and it can be furthered through suggestion (p. 6-10).

Subjects who are not as deeply hypnotizable may experience only some of the above phenomena. In the present study, hypnosis will be defined operationally as the reaction of most people on the induction of the Harvard Group Scale of Hypnotic Susceptibility; Form A (Shor & Orne, 1962).

'Forensic hypnosis' is the use of hypnosis for improving eyewitness recall (Timm, 1981). This could involve the courts or simply the police investigation. Cohen (1980) uses the term 'investigative hypnosis' to refer to the use of hypnosis to aid the police in their investigation. This does not include the use of

hypnosis for court purposes. 'Hypermnnesia' refers to unusually complete or vivid recall as compared to the awake state (Woolf, 1977). 'Hypnotic hypermnnesia' is enhanced recall in the hypnotized state of material which was learned or observed in the waking state (Relinger, 1984).

Sanders and Simmons (1983) outline the three most common question formats used in forensic situations involving hypnosis. 'Free recall' refers to asking the eyewitness for a complete narrative account of everything observed in the incident of interest. Asking specific, open-ended questions is called 'cued recall'. 'Recognition' denotes asking the witness questions, and the answer is to be one of the alternatives provided (multiple-choice).

The term 'waking state' will be used to refer to the nonhypnotic state. This is not meant to imply that hypnosis involves a sleep-like or trance state (Smith, 1983). The term 'hypnotizable' will be used instead of the more commonly used term 'susceptible' to avoid erroneous interpretations. 'Ecological validity' is defined as "the ability to generalize the results of the study across settings or from one set of environmental conditions to another" (Christensen, 1985, p. 301). In this context, the term refers to generalizing results from research to non-laboratory (forensic) settings.

Theories of How Hypermnnesia Works

Smith (1983) offers possible explanations as to how hypnotic hypermnnesia works. Hypnotic hypermnnesia may be caused by a criterion change--under hypnosis a person may be more likely to report things about which they are not very sure, or are more likely to guess. If this explanation is valid, one would expect that

hypnosis subjects would make more errors in recall, as well as recalling additional details correctly. Hypnotic hypermnesia may also be caused by a reinstatement of the relevant context or mood (e.g., time regression). Improved recall with hypnosis might also be due to subsequent (repeated) testing. Some researchers (e.g., Dorcus, 1960; Rosenthal, 1944; White, Fox & Harris, 1940) suggest that hypnotic hypermnesia operates by inducing relaxation, and thereby facilitating memory. In this context, White et al. (1940) state:

(E)veryone must have had the experience described by (William) James of trying in vain to recall something, only to have it afterwards "saunter into the mind as innocently as if it had never been sent for"; gaps in memory can rarely be filled by simply trying harder (p. 101).

Perhaps the most commonly held, and commonly criticized theory of hypermnesia is the "exact copy" theory of memory. This theory is illustrated in the words of a police officer who was trained in hypnosis: ". . . (I)t is all there even if you are not aware of it. Everything that has ever happened to you, from birth to death is recorded on your brain permanently " (Putnam, 1979b, p. 62). The "exact copy" theory also assumes that whatever is remembered is accurate. One logical extension of this theory has been the TV screen technique as a hypermnesia aid. This involves telling the person that their brain has recorded all which occurred, and that if they try hard enough they can remember everything. The person is then hypnotized and instructed to "view" the event as if they are watching television, being able to replay a scene and to use slow motion. The TV screen technique has been criticized for putting

undue pressure to remember on the person and possibly increasing the number of errors in recall.

The exact copy theory has been criticized for not conforming to the available evidence concerning the process of remembering. Most researchers indicate that memory likely operates more along the lines of the "constructive" theory. This view of memory holds that a person not only recalls the memory but also reconstructs the event when attempting to remember it (Bartlett, 1932). Thus, the memory may change after the time that the event occurred (Loftus, 1979a; Putnam, 1979b).

Does Hypnosis Improve Recall?

Despite the fact that the FBI guidelines for the use of forensic hypnosis state that hypnosis facilitates memory (Ault, 1979), this assertion is not universally held. Case studies and experiments will be reviewed in addressing this question.

Case Studies

Hypnosis has been used successfully in some highly publicized cases such as the 1976 Chowchilla kidnapping and the bombing of the Naharia-Haifa bus in Israel in 1973 (Time, 1976). The Chowchilla kidnapping (People v. Woods et al., 1977) involved the abduction of 26 school-age children and their bus driver by three armed men. The victims were transported by van to a remote rock quarry and were sealed inside a 'tomb' underneath the ground. Although the bus driver and two of the boys escaped, they were not able to recall the license plate numbers of the vans. Hypnosis led to the bus driver recalling one of the license plate numbers, with the exception of one digit. This information helped solve the case, after

one of the biggest manhunts in California history (Kroger & Douce, 1979).

A multitude of case studies suggest that hypnosis enhances recall for crimes. Dorcus (1960) obtained positive results in two of the four cases he reported. Concerning crimes involving homicide, rape, and kidnapping, Reiser (1976) claimed a 60% success rate for hypnosis. Stratton (1977) reported on over 50 cases of investigative hypnosis involving murder, rape, kidnapping and robbery. Hypnosis was judged to have been helpful in 90% of these cases. Schafer and Rubio (1978) reported 13 cases of investigative hypnosis, in which the time delay between the crime and the hypnotic interrogation ranged from a few hours after the incident to one year. Hypnosis was believed to have been substantially helpful in 10 of the cases. Kroger and Douce (1979) conducted forensic hypnosis with 53 witnesses in 23 cases, and obtained new information in over 60% of the cases. However, only a small proportion of the new information was corroborated. Reiser (1980) reported a 79% rate of hypnotic hypermnesia in case studies. Reiser and Nielson (1980) reported that of 400 forensic hypnosis sessions between 1974 and 1979 conducted by the Los Angeles Police Department, 80% of the sessions resulted in new information and this information was valuable in 68% of the sessions.

In the best controlled case study to date, Yuille and Kim (1987) retrospectively examined seven serious crimes from police files in which hypnosis had been used as a memory aid. One or two standard police interviews preceded the hypnotic interview, and in one case an additional standard interview followed the hypnotic interview. A

statement analysis technique was applied to the testimony of nine victims and witnesses of the crimes. Statements were broken down into factual units, and classifiable facts were scored as correct or incorrect for both hypnotically-aided and non-hypnotic statements. Hypnosis almost tripled the amount of information provided in the standard interviews, with no decrease in accuracy of information. The researchers concluded that the increases in recall were of questionable forensic value, and speculated that it may have been due to three cognitive memory facilitation techniques which were utilized in the hypnosis interviews, but not in the standard interviews.

Case studies, however, are not convincing evidence of the phenomenon. They do not involve control conditions capable of refuting alternative explanations. Further, case studies are prone to a selection bias, with unsuccessful uses of hypnosis being less likely to be published (Cohen, 1980; Griffin, 1980). Pinizzotto (1989) points out that there are many reported cases in which the license numbers reported under hypnosis did not correspond to those of the plate which was later revealed. Accordingly, researchers have attempted to empirically demonstrate the alleged hypermnesia effect of hypnosis. These studies can be categorized as learning/recall studies, using either nonsense material or meaningful material, and forensically-relevant studies, using material similar in nature to that in the forensic context.

Learning/Recall Studies

Nonsense material and word lists. In one of the earliest experimental investigations of hypnotic hypermnesia, Huse (1930)

compared waking memory to hypnotic memory 24 hours after eight subjects learned pairs of symbols and nonsense syllables. Each subject served as his/her own control and the state of recall was counterbalanced. Huse did not find significant differences between recall under hypnosis and in the awake state. Several other early studies, including those using paired-word associates and word-lists have also obtained negative findings (Das, 1961; Mitchell, 1932; Rosenhan & London, 1963; White et al., 1940; Young, 1925). The early studies tended to have a few important methodological weaknesses such as not controlling for task-motivation instructions, practice effects, and the level of hypnotizability.

Despite the utilization of better methodological controls, the majority of the more recent studies, employing nonsense material and word-lists, have likewise obtained negative findings (Barber & Calverly, 1966; Dhanens, 1973; Dhanens and Lundy, 1975; Salzberg & DePiano, 1980). An example of such a study is that of Dhanens and Lundy (1975) who used a between-subjects design, controlling for the level of hypnotizability. Subjects learned nonsense syllables and recalled them one week later. The six conditions were: 1) hypnosis with time regression; 2) hypnosis with motivating instructions; 3) time regression alone; 4) motivating instructions alone; 5) relaxation; and 6) a control group. There were no significant differences between groups in terms of recall of the nonsense syllables.

Only three studies have found evidence of hypnotic hypermnesia for meaningless material. Rosenthal (1944) found that hypnosis aided the recall of lists of common words that were learned while

the subjects were experiencing stress. Augustynek (1977; cited by Relinger, 1984) found enhanced hypnotic recall for nonsense syllables and word-lists, as compared to the control condition and a relaxation condition. Shields and Knox (1986) found that hypnosis led to a moderate increase in recall over control conditions for a list of words processed at a "deep" level, but not for a list processed at a "shallow" level.

Yuille and McEwan's (1985) conclusion that such studies have not demonstrated a consistent advantage for hypnosis is justified. Relinger (1984) concurs in stating that hypnosis has not generally resulted in hypermnesia in experimental studies, and where it has, this has been the exception.

Meaningful material. Stalnaker and Riddle (1932) had their 12 high hypnotizable subjects attempt to recall meaningful material--prose learned at least one year earlier and not seen or rehearsed since then. They obtained a 39% increase in recall under the hypnosis condition, but this may have been due to the fact that motivating instructions were not controlled across conditions. White et al. (1940) obtained positive results for poetry, and an indication of hypnotic hypermnesia for "moving-picture" scenes. However, they had a small number of subjects and did not control for the level of hypnotizability. Rosenthal's (1944) hypnotized subjects demonstrated hypermnesia for poetry using the free recall format. Sears (1954) had subjects view objects on a table, recall the objects in the awake state, and later recall the objects while hypnotized. Sears obtained positive results concerning hypnotic

hypermnnesia, but the improved recall may have been due to a practice effect.

A couple of recent studies have also found hypnosis to enhance recall. Hagedorn's (1970) hypnosis group surpassed the control group on the recall of material from a class lecture. Augustynek (1977; cited by Relinger, 1984) found positive results concerning hypnotic hypermnnesia one week after being exposed to meaningful material.

A couple of other studies have found partial support for hypnotic hypermnnesia. Dhanens (1973) tested their subjects on a prose passage one week after it was learned. Although there was no main effect for the hypnosis condition, high hypnotizable subjects produced a significantly greater improvement in recall than the control group. Cooper and London (1973) tested their subjects in a within-subjects design two weeks after they were exposed to an article concerning properties of a rare chemical. They did not find a statistically significant hypnotic hypermnnesia main effect, but the greatest increase in recall was for the high hypnotizable subjects when tested while under hypnosis. Dhanens and Lundy (1975) tested their subjects on prose. They obtained positive results for the hypnosis and motivating instruction group for the high hypnotizable subjects. However, the other hypnosis group (with time regression instructions) did not show signs of hypnotic hypermnnesia.

Swiercinsky and Coe (1970) employed meaningful material, but obtained negative results. They exposed 45 subjects to a 10-minute selection on "matter" and tested them two weeks later. The three recall conditions of hypnosis, task motivating instructions, and a

control group did not differ in terms of recall. High and low hypnotizable subjects performed essentially the same.

Thus, a number of studies utilizing meaningful material have provided evidence of hypnotic hypermnesia. However, many of these studies are methodologically weak. For example, Dywan and Bowers (1983) suggest that studies such as that of Dhanens and Lundy (1975) which did not control for the hypermnesic effect of repeated testing--something with which every police officer is familiar--are fundamentally flawed. Many studies involved task motivating instructions in the hypnosis condition, but not in the control condition. Task motivating instruction alone can facilitate recall (Barber, 1965a). Barber and Calverley (1966) criticized the study of White et al. (1940) for not controlling for whether the eyes were open or closed. They speculated that having the eyes closed (as was the case in the hypnosis condition) might have been responsible for the enhanced recall.

Studies failing to find the hypnotic hypermnesia effect can also be criticized on methodological grounds. For example, although Barber and Calverley (1966) pointed to several inadequacies in studies claiming hypnotic hypermnesia, their study cannot be regarded as a fair test of the phenomenon since they experienced a bottoming effect. All of the methodological controls available can be undermined by asking questions which cannot be answered regardless of the condition of recall.

Although the studies conducted over the last decade and a half have been more methodologically sophisticated, weaknesses in design persist. Further, the numerous inconsistencies between

studies may account for the conflicting results. Das (1961) states: "The variance can be caused by several factors, some of the more important ones being the depth of hypnosis at the time of recall, meaningfulness of material memorized, the cues, implicit and explicit, provided by the experimenter and the experimental design, and last, the attitude of subjects to the experimenter" (p. 111).

The available evidence indicates that hypnosis does not facilitate the recall of meaningless material, but may facilitate the recall of meaningful material. Further research employing more sophisticated procedures are needed.

Forensic Studies

In recent years the primary application of the alleged hypnotic hypermnesia effect has been in the forensic context. Attempts to experimentally simulate the forensic use of hypnosis have primarily involved staging live enactments, showing videotapes, and presenting slide presentations of simulated crimes. Other less ecologically-valid stimulus materials have also been used.

Live enacted crimes. An early attempt to investigate memory for a staged crime was reported by Barmann (1960). Two stenographers taking notes on a lecture for police officers unexpectedly began arguing, pulled at each other's hair, struggled over a purse, and finally one stabbed the other and ran off. The entire incident only took 10 seconds. Five volunteers 1) wrote down all they could recall in the awake state immediately after the incident, 2) were hypnotized and reported orally into a tape recorder after being awakened, 3) were hypnotized and reported orally while under the trance, and 4) gave a written report in the awake state.

Although it was found that hypnosis aided recall to a considerable extent, the study is methodologically unsophisticated in many respects. Zelig and Beidleman (1981) were critical of the results since there were demand characteristics which may have led to suppression of information under the awake condition. Furthermore, the results may have been due to repeated attempts at recall since control subjects were not utilized.

Burch (1974, cited in Schafer & Rubio, 1978) attempted to replicate Barmann (1960), using subjects who were not very hypnotizable. Burch's results provided minimal support for the hypermnesic effect of hypnosis.

Timm (1981) staged an unexpected mock assassination in a classroom. Approximately two months later, subjects were asked cued recall and recognition questions concerning visual and verbal stimuli. A total of 45 subjects, balanced for sex, were randomly assigned to one of three groups: 1) hypnosis plus regression suggestions; 2) awake and regression suggestions; and 3) a waking control group. Results indicated enhanced recall for both experimental groups for both types of recall, but the data only approached statistical significance ($p < .09$). These results raise the question as to the relative contribution of time regression suggestions to hypnotic hypermnesia.

Timm (1982, cited in Yuille & McEwan, 1985) staged a live enactment of a crime and employed 1) a hypnosis group which also received task motivating and imagination suggestions, 2) an awake group receiving the same memory assistance procedure, and 3) a control group. The hypnosis and memory assistance waking group

had more correct and incorrect responses than the control group. There were no significant differences in terms of accuracy between the hypnosis group and the waking memory assistance group. A possible confounding factor in the two Timm staged enactments is that they used hypnotizable subjects for the hypnosis group and nonhypnotizable subjects for the control group.

One live enactment study failed to find evidence of hypnotic hypermnesia. Buckhout, Eugenio, Licitra, Oliver, and Kramer (1981) exposed 75 subjects to a simulated crime in a classroom. The subjects recalled the incident one week later, half under hypnosis and half in the awake state. There were no significant hypnosis effects.

Filmed enacted crimes. A convenient way of presenting the stimulus material is to use film or videotape. Griffin (1980) showed 65 subjects a 28-minute film of 11 different simulated crimes ranging from murder to theft. The five groups of subjects were: 1) subjects hypnotized once; 2) subjects hypnotized twice; 3) a randomly selected control group; 4) a control group which thought at the time of viewing the film that they were no longer a part of the experiment; and 5) a control group of subjects who did not want to be hypnotized. Subjects were questioned 2-13 days and 18-28 days after viewing the film. Griffin (1980) found a clear-cut hypnotic hypermnesia effect at both time intervals, but did not report the magnitude of difference in recall.

McEwan and Yuille (1982; cited by Smith, 1983) showed their subjects a 90-second videotape of a simulated bank robbery which is used to train bank tellers. One week later the subjects were

interviewed either in the awake state or under hypnosis. The researchers used questioning techniques which were developed by the police, and the 42 questions concerned only suspect descriptions, including 5 misleading questions. Although subjects in both conditions were very accurate, responding correctly 79% of the time, no differences in recall were found between hypnotized and nonhypnotized subjects.

Sanders and Simmons (1983) showed their subjects a 20-second videotape of an enacted pick-pocket scene. One week later subjects were asked five specific neutral questions about the incident. Hypnosis subjects did slightly but nonsignificantly better than control subjects on these questions. Their subjects also performed a facial recognition task, in which the line-ups were on videotape. In one line-up the thief was present but was not wearing the distinctive jacket he wore at the time of the enactment. In the other line-up condition, the thief was not present but someone else was wearing his jacket. Hypnotic subjects made significantly fewer correct responses than did their counterparts in the control group (17% versus 40% correct responses, respectively). Hypnosis subjects seem to have responded on the basis of the thief's jacket, rather than on the face. Sanders and Simmons (1983) noted that if they had utilized a condition in which the thief was wearing the distinctive jacket, hypnosis subjects' reliance on this cue would have led to more correct responses.

Yuille and McEwan (1985) used a 90-second videotaped sequence of a bank teller training film, depicting a simulated bank robbery. Seventy-two subjects were assigned to one of three conditions: 1)

hypnosis; 2) relaxation; and 3) control. Half the subjects in each condition received imagery instructions, and the other subjects received guided memory instructions. One week after seeing the videotape, subjects were asked 42 neutral questions concerning the video and the live context of the viewing room. They also participated in a photo identification task, although the hypnotic subjects were de-hypnotized prior to making the identification. The hypnosis group did not recall more than the relaxation or control groups, and there were no main effects for the type of memory instructions. However, recall for the video event across groups was substantially higher than for the live context. There were no significant differences between the conditions on the facial recognition task.

Geiselman, Fisher, MacKinnon, and Holland (1985) compared the effectiveness of a hypnosis interview, a cognitive interview based on memory-retrieval mnemonics, and a control (police) interview 48 hours after viewing the stimulus material. High and low hypnotizable subjects in each condition viewed one of four films of approximately 4 minutes in length. The films were simulated violent crimes with at least one person being killed in each scene. Seventeen experienced law enforcement personnel served as interviewers, using guidelines rather than a standardized script in conducting the interview. Their results showed hypermnesia for the hypnotic and cognitive groups, with no significant differences between these groups. The hypermnesia, however, was only evident for the two films which had a distinctly high number of events per unit time (rapidly and simultaneously occurring events). As the

authors note, it is possible that the greater amount of time spent in the cognitive interview may have contributed to the hypermnesia found with this procedure.

Films of non-criminal events. Six studies have employed films or videotapes of non-criminal events. Putnam (1979a) showed 16 subjects a videotaped car-bicycle accident. Hypnosis subjects and waking subjects were asked 9 neutral questions either shortly following the film, or 24 hours later. The hypnosis group outperformed the waking group with the 24-hour delay, and the converse was true for the 15-minute delay. However, these differences were not statistically significant. Relinger (1984) suggests that this may have been due to using a restricted recall format, or to having asked too few questions.

Zelig and Beidleman (1981) conducted a study similar to that of Putnam (1979a), but attempted to induce anxiety in the subjects by having them view a stress-provoking motion picture of workshop accidents. Medium-to-high hypnotizable subjects were asked recognition questions 20 minutes after viewing the film. They failed to find evidence for hypnotic hypermnesia.

Helwig (1978) also studied the effect of stress on hypermnesia. Although all 80 subjects saw the same film, one group first heard stress-inducing instructions while the other group received relaxation-inducing instructions. Recall was evaluated 1 week later. Helwig did not find support for hypnotic hypermnesia. Whether the nature of the instructions had the desired effect is difficult to judge, for any differences in levels of anxiety may have been eliminated once all subjects were exposed to the same film.

DePiano and Salzberg (1981) note that "despite the fact that the "stressed" group reported more anxiety than the "non-stressed" group, differences in emotional arousal may have not been achieved, and self-report of differences may merely reflect the set established by the instructions" (p. 386).

Thomas and Phillips (1983) studied the effect of interrogation state, level of hypnotizability, and time delay (immediate recall versus 24-hour delay). Their subjects viewed a videotaped car accident and were tested on free recall, cued recall and recognition. In the free recall condition hypnotized subjects performed approximately equal to waking subjects in terms of the amount of accurately recalled material. In the cued recall format, hypnotic subjects demonstrated greater accuracy of recall than waking subjects. Under the recognition format, hypnotic subjects were less accurate than their counterparts.

Frain, Thomas, Kunzman, Buckholz, and Au (1984) studied the effect of arousal on hypnotic hypermnesia. Their subjects were tested on the details of a car accident and were either questioned with a 2-week or a 6-week delay. They found that waking subjects recalled more information than hypnotized subjects when tested for cued recall immediately after seeing the stimulus material. Under the free recall and recognition conditions, the hypnosis and control groups were approximately equal.

Stager and Lundy's (1985) high and low hypnotizable subjects viewed a 15-minute entertaining movie called "Posters". Subjects were tested on 20 cued recall questions immediately following the film, and on another 20 cued recall questions one week later. Recall

was significantly better for hypnosis subjects than for waking subjects, and this hypermnesia was due to the performance of the high hypnotizable subjects in the hypnosis condition.

Slide presentations of enacted crimes. An alternative stimulus medium to films or live enactments is slide presentations. One advantage of using slides is the ease of precisely determining how long various stimuli are presented (e.g., if a gun is visible in 2 slides, and each slide is shown for 3 seconds, the gun will be visible for 6 seconds). The length of exposure of any aspect of the stimuli can easily be altered.

Buckhout, Eugenio, Licitra, Oliver, and Kramer (1981) report a couple of studies employing this medium. They showed a simulated violent assault in a prison to hundreds of people in several settings. The slide show was accompanied by a sound track. In the first study, Buckhout et al. assigned 105 subjects to one of three groups: 1) hypnotic interrogation; 2) a standard police procedure; and 3) a waking control group. The subjects were questioned 48 hours after seeing the crime. Significant differences between the groups were not found. They found that the best predictor of memory 48 hours later was not whether the person is hypnotized or not, but the level of their waking memory immediately after seeing the crime.

The second study provided similar results with a 7-day retention interval. Hypnosis was not superior to a control condition in terms of hypermnesia. They found that individuals in the group with the poorest recall immediately following the crime were most likely to experience hypermnesia. The witnesses with the best

initial recall demonstrated forgetting over the 7-day interval, whether hypnotized or not.

Sheehan and Tilden (1983, 1984, 1986) have conducted a few studies using slides without a sound track. Their simulated crime was the wallet-snatching sequence used by Loftus (1979a) and Powers, Andriks, and Loftus (1979). In the first of their studies, Sheehan and Tilden (1983) investigated the effects of the interrogation state, level of hypnotizability, and neutral versus misleading questions. Their waking subjects received regression and motivation instructions, and the questions consisted of 18 recognition and 12 open-ended questions. Free recall was tested just prior to the end of the study. Hypnosis and waking subjects did not demonstrate differences in recall on the neutral questions.

In the second study, Sheehan and Tilden (1984) showed 11 of the 24 slides used in their previous study. They employed 39 high hypnotizable subjects in the hypnosis condition and 40 low hypnotizable subjects in a simulating condition. Subjects were tested on free recall, 12 cued recall questions, and 18 recognition items. There were no hypermnesia differences between hypnotic subjects and simulators on the neutral recognition items. Free recall was analyzed in terms of central objects, peripheral objects, and actions. There were no differences between hypnotized subjects and simulators on central objects and actions, but hypnotic subjects reported more peripheral objects than simulators. One problem with this study is that high and low hypnotizable subjects may respond differentially regardless of whether hypnosis is employed.

In their third study, Sheehan and Tilden (1986) studied high and low hypnotizable subjects, and either asked them neutral or misleading questions. They did not find enhanced recall for the hypnosis group.

Other forms of stimulus media. Three studies are somewhat forensically relevant but differ significantly from the studies previously discussed (DePiano & Salzberg, 1981; Dywan & Bowers, 1983; Wagstaff, 1982). DePiano and Salzberg (1981) compared hypnosis and waking groups (controlling for task motivating instructions), over three levels of arousal (traumatic arousal, sexual arousal, and low arousal) induced by watching different non-crime films. Subjects were tested on 1) their recall of an audio message concerning the nature of some electronic equipment, 2) a staged audio disturbance consisting of a human interest story, and 3) phrases on three posters on the wall in the room. Subjects completed phrases which were basically cued recall questions. Hypnotic hypermnesia was found for recall across all three types of information. However, DePiano and Salzberg did not control for the hypermnesic effect of repeated testing. Erdelyi and Kleinbard (1978) have found that recall improves with repeated attempts to remember, regardless of the passage of time. This highlights the primary difficulty with case studies, and is one reason which makes the incorporation of a control condition necessary.

Wagstaff's (1982) 25 subjects were shown pictures of 4 faces. Seven days later they saw an array of 12 pictures of faces and were asked to identify the face they were previously shown. Control subjects performed better than hypnosis subjects, but the results

were not statistically significant. Wagstaff did not control for the hypnotizability level of the subjects.

Dywan and Bowers (1983) showed their subjects 60 slides of simple black and white line drawings of common objects. Subjects attempted to recall the objects following the presentation of the stimulus material, and continued to do so over the course of the next week. At the end of the week the subjects were put into a hypnosis condition or a task-motivating condition. The hypnosis group performed significantly better than the control group, and the high hypnotizable hypnotized subjects recalled twice as many new items as control subjects. However, the absolute value of hypermnesia was small. In the high hypnotizable hypnosis group, 6 of the 15 subjects failed to produce new information, and the mean increase was 1.4 items. The general results of their study were replicated in an unpublished follow-up study by the same authors (cited in Dywan & Bowers, 1983).

Summary

Smith's (1983) statement that ". . . controlled laboratory studies have consistently failed to demonstrate any hypnotic memory improvement" (p. 387) would be more accurate if phrased, "controlled laboratory studies have failed to demonstrate any consistent hypnotic memory improvement." The problem with the forensic hypnosis literature is that there are few consistent results, one way or the other. Studies failing to find evidence for the hypnotic hypermnesia phenomenon are generally just as methodologically flawed as those which find that hypnosis enhances recall.

There are many dimensions upon which future research can focus in an attempt to make sense of the present findings (many of these factors are discussed below). However, a priority at this time should be to conduct studies which are methodologically sound, and to study the characteristics of experiments which may influence the results. The present study examined the effects of the three most commonly used stimulus media (live, videotape and slides) on hypnotic hypermnesia.

The above review noted five studies which have staged a live enactment. One study reported clear-cut hypnotic hypermnesia (Barmann, 1960) and one study reported clear-cut negative results (Buckhout et al., 1981). Burch (1974, cited in Schafer & Rubio, 1978) found some evidence of hypnotic hypermnesia, and the studies of Timm (1981; 1982, cited in Yuille & McEwan, 1985) found hypermnesia for the hypnosis groups over the control groups, but not over the waking groups employing memory assistance techniques.

Five studies have employed videotaped simulated crimes. One study reported hypnotic hypermnesia (Griffin, 1980), and two reported negative results (McEwan & Yuille, 1982, cited in Smith, 1983; Yuille & McEwan, 1985). Two studies found evidence of hypnotic hypermnesia, but in one case the results were not statistically significant (Sanders & Simmons, 1983), and in the other case the hypnosis group outperformed the control group but not a waking group employing memory assistance procedures (Geiselman et al., 1985).

Six studies have used videotape or films, but have not made use of simulated crimes. Both studies using stressor films (Helwig,

1978; Zelig & Beidleman, 1981) obtained negative results. The studies using filmed accidents either failed to find evidence of hypnotic hypermnesia (Frain et al., 1984; Putnam, 1979a), or obtained hypnotically enhanced recall only under some conditions (Thomas & Phillips, 1983). The only study to date using an entertaining movie (Stager & Lundy, 1985) obtained statistically significant support for hypnotic hypermnesia.

The two experiments of Buckhout et al. (1981), using slide presentations of an enacted crime, failed to find any evidence of hypnotically-enhanced recall. Sheehan and Tilden (1983, 1986) also failed to elicit improved recall in the hypnosis condition. Sheehan and Tilden (1984) reported minimal evidence for the effect.

Although a superficial scanning of the results of these various studies suggests that live enactments may favor hypnotic hypermnesia to a greater extent than slide presentations (and perhaps videotaped enactments), the issue may not be this simple. Yuille and Cutshall (1984), in a study which did not employ hypnosis, found that eyewitnesses of a live enactment recalled more action details, were more accurate in this recall, but did not recall more descriptive details than subjects who viewed a videotaped version of the event. A study is needed which systematically examines the effect on hypermnesia of the stimulus medium.

Are Hypnosis Subjects More Likely to Make Errors?

It is well established that hypnotized subjects can lie (Orne, 1979), but the question that is of concern here is whether people also unwittingly make more errors in recall when hypnotized. Eugenio, Buckhout, Kostas and Ellison (1982) found that subjects

who are repeatedly questioned show an increase in confabulation, likely due to the strong pressure to produce additional information. This appears to be the case for hypnotized subjects as well (Kroger & Douce, 1979). This should not be surprising since subjects will likely first report memories of which they are confident and later report ones of which they are less certain. However, the issue considered here is whether hypnosis disproportionately increases errors over those made in the waking state.

Neutral Questions

The two basic experimental ways of assessing confabulation in recall is to count the number of errors made on neutral questions, or to incorporate misleading information through inaccurate data in questions and count the number of errors made. Although some studies have not found that hypnosis subjects make more errors on neutral questions than waking subjects (Geiselman et al., 1985; Griffin, 1980; Putnam, 1979a; Stager & Lundy, 1985; Thomas & Phillips, 1983), other studies have found a higher error rate (Dywan & Bowers, 1983; Sheehan & Tilden, 1983, 1984; Wagstaff, 1982). Wagstaff (1982) found that on a facial recognition task, hypnosis subjects made significantly more false alarms (i.e., an incorrect identification while being confident of the accuracy of the recall). Dywan and Bowers (1983) found that although their high hypnotizable subjects recalled twice as much information as controls, they also made three times as many errors. Sheehan and Tilden (1983) found that high hypnotizable subjects made more intrusions than low hypnotizable simulating subjects. Sheehan and Tilden (1984) found that on a test of free recall, hypnotic subjects

confabulated appreciably more than simulating subjects concerning peripheral details, but there was no increase in errors in terms of central details.

Misleading Questions

The issue of misleading questions is important in terms of ecological validity in that police officers may unknowingly ask witnesses such questions. Several studies (McEwan & Yuille, 1982, cited in Smith, 1983; Putnam, 1979a; Sanders & Simmons, 1983; Zelig & Beidleman, 1981) have used misleading questions and have found that hypnotic subjects are more susceptible to making errors. Putnam's (1979a) study was the first to employ misleading questions with hypnotic subjects. He found that hypnotized subjects made more errors than waking subjects. Zelig and Beidleman (1981) asked their subjects leading questions which implied an incorrect answer. Hypnotized subjects were misled and therefore made less correct and more incorrect responses on these items than their nonhypnotized counterparts. Sanders and Simmons (1983) found that both low and high hypnotizable subjects made more errors on misleading questions than control subjects on the cued recall task. Unexpectedly, there was a significant negative correlation--the lower the hypnotizability level, the greater the number of errors made.

Other studies have found that waking subjects make just as many errors on misleading questions as hypnotic subjects (Sheehan & Tilden, 1983, 1984; Yuille & McEwan, 1985). Sheehan and Tilden (1983) suggested that the most important factors in terms of misleading questions and subsequent incorrect responses are

specific item characteristics such as the salience and ambiguity of the stimuli. Loftus (1979b) has shown that the nature of the wording of the misleading question also affects the frequency of incorrect responses.

One problem with studies using misleading questions has been that responding incorrectly has typically required an affirmative answer (Smith, 1983). Thus, it is difficult to determine whether the errors are due to being more suggestible, or to being vulnerable to a "yes response" bias.

As is the case with the question of the hypermnesic effect of hypnosis, the evidence concerning errors is equivocal. This is the case for misleading questions as well as for neutral items. Although the police often do not care if the number of errors increase since they will independently verify the information, this is still an important issue since prior to the information being verified, an innocent suspect could spend time in custody and suffer greatly.

The present study assessed the number of errors made by hypnosis and waking subjects on neutral questions, and included misleading questions in the second questioning to assess whether hypnotic subjects respond differently than waking subjects to such questions.

Effect of the Level of Hypnotizability

If hypnosis has an effect on hypermnesia or confabulation, it is logical to assume that high hypnotizable subjects will experience more of this effect than less hypnotizable subjects. DePiano and Salzberg (1981) state that "if only moderate to highly hypnotizable

subjects show the effect, it may be attributed to hypnosis per se. However, if subjects along the entire range of hypnotizability increases recall after exposure to hypnotic induction, the differences would be attributable to motivational aspects of the hypnosis situation and not to hypnosis per se" (p. 396). However, it is possible that hypnosis may contribute to hypermnesia, or errors, in the absence of a correlation between depth of trance and the effect.

Hypermnesia

Some studies have found that high hypnotizable subjects are more likely to experience hypermnesia than their less hypnotizable counterparts (Dhanens & Lundy, 1975; Dywan & Bowers, 1983; Stager & Lundy, 1985). Others (Buckhout et al., 1981; Geiselman et al., 1985; Sheehan & Tilden, 1983; Thomas & Phillips, 1983; Wagstaff, 1982; Yuille & McEwan, 1985; Zelig & Beidleman, 1981) found that the level of hypnotizability was not a relevant factor in terms of the amount of correctly recalled information. Frain et al. (1984) were not able to systematically study the effect of hypnotizability on accurate recall in their study, but found a negative correlation between recall and level of hypnotizability for hypnotized subjects tested 6 weeks after viewing the stimulus material. That is, the lower the hypnotizability level, the more information recalled.

The number of high susceptible subjects used in a study may be important since not all high hypnotizable subjects show the effect. For example, although Dywan and Bowers (1983) found a general hypnotic hypermnesia effect, 6 of their 15 high hypnotizable subjects failed to demonstrate this phenomenon. Thus, Putnam's

(1979a) 9 medium-to-high hypnotizable subjects may have been too few to show hypermnesia.

Errors

The literature concerning the effect of the level of hypnotizability on the number of errors made is also equivocal. Some studies (Sanders & Simmons, 1983; Thomas & Phillips, 1983) indicate that high hypnotizable subjects make less errors than their low hypnotizable counterparts. Other studies indicate that the level of hypnotizability has no effect on the number of errors made on misleading questions (Sheehan & Tilden, 1983), or a photo identification task (Wagstaff, 1982).

The results of Sheehan and Tilden's (1983) study are interesting in that high and low hypnotizable subjects differed in their error rate when questioned in the waking state. Thus, the level of hypnotizability per se may be a relevant factor, as Barber and Calverley (1966) have suggested.

The present study did not investigate differential responding on the part of subjects of differing hypnotizability levels, but instead controlled for the level of hypnotizability, using only high and high-medium hypnotizable persons.

Does Hypnosis Increase Confidence in Recall?

Although Yuille and McEwan (1985) found that their more confident subjects were more likely to be accurate, most studies have either shown that hypnosis subjects are just as confident as waking subjects even though they made more errors (Sanders & Simmons, 1983; Putnam, 1979a; Zelig & Beidleman, 1981), or that hypnosis subjects are more confident than waking subjects although

recall was equal across these groups (Sheehan & Tilden, 1983, 1984). Further, Sheehan and Tilden (1983) found that the increase in confidence for their high hypnotizable hypnosis subjects carried over to the waking state.

Sheehan and Tilden (1984) found that some of their simulating subjects, but none of their hypnosis subjects, rated their confidence as "certain" for all the test items. They concluded: "This result suggests that confident reporting per se is not necessarily a distinguishing feature of hypnotic performance as others have suggested (e.g., Putnam, 1979a; Zelig & Beidleman, 1981), but that confident reporting may occur as a result of the social psychological pressures generally existing in the situation that then motivate subjects to report with certainty that something is true when it is not" (p. 56). Only a control group of simulating subjects is able to identify such a response set. Yuille and McEwan (1985) suggest that confidence may simply be a personality trait, but this does not account for the studies which indicate that hypnosis subjects, as compared to waking subjects, have unwarranted confidence in their recall.

Since it has been found that juries are greatly influenced by the confidence of a witness (Wells, Lindsay, & Ferguson, 1979), high confidence of inaccurate recall is potentially dangerous. Although the issue of confidence is very important, logically, investigation here must wait until the existence of the hypermnesia effect is established, refuted, or qualified.

Report Format

The three types of report format typically used in forensic hypnosis studies are free recall, cued recall, and recognition. In nonhypnosis studies, Lipton (1977) found that the recognition format is dramatically less accurate than free recall, and Hilgard and Loftus (1979) reported that free recall results in the greatest accuracy but the lowest amount of recall.

Results from the hypnosis studies concur with these findings. It has been found that testimony given under the free recall format is very accurate (Geiselman et al., 1985; Sheehan & Tilden, 1983). Geiselman et al. (1985) note, however, that information given under this recall format is less complete than that given in response to specific questions.

In terms of ecological validity, the police often begin their questioning with a free recall format. However, they (and the courts) generally resort to cued recall and recognition following the free recall format. Although it is in many ways desirable to follow this sequence in the experimental context, scoring free recall narratives in an objective manner is extremely difficult. More sophisticated procedures are needed in scoring narrative accounts.

If cued recall and recognition formats are used in place of free recall, the experimenter should use a sufficient number of questions. Using many questions nullifies the criticism that hypnotic hypermnesia was not found due to not using enough questions. Putnam (1979a) only asked 9 neutral questions, and is vulnerable to this criticism. Finally, in order to avoid leading the witness, cued

recall questions should employ indefinite articles rather than definite articles (Loftus & Zanni, 1975).

Although Relinger (1984) believes that free recall is best suited to demonstrate hypnotic hypermnesia, the present study only tested for cued recall, due to the difficulty in reliably scoring narrative accounts, and since the primary interest was the differential effect of three forms of stimulus media.

Facial Recognition Tasks

One special form of the recognition format involves asking subjects to identify the offender from a line-up or from "mug shots." Yuille and McEwan (1985) did not find significant differences between the interrogation conditions on their facial recognition task, but hypnosis subjects were de-hypnotized before they were asked to make an identification. Sanders and Simmons (1983) conducted a facial recognition task using videotaped line-ups. They found that hypnotic subjects made significantly fewer correct responses than did their counterparts in the control group, but their task basically consisted of using a misleading cue. Wagstaff's (1982) subjects were asked to identify the pictures they had been shown 1 week earlier. Although hypnosis subjects did non-significantly poorer than control subjects, they also made a significantly greater number of incorrect identifications of which they were confident. Although no study has found hypnosis to aid in identifying the offender in a facial recognition task, the present study included a facial identification task, since this is often the most important piece of testimony in a criminal case.

Emotional Arousal

Udolf (1983) believes that hypnosis is the most helpful when the witness experiences a great amount of stress. Several writers (Goldstein & Sippelle, 1970; Reiser, cited by Dellinger, 1978; Sanders & Simmons, 1983; Schafer & Rubio, 1978) believe that hypnosis is likely only helpful for cases where trauma produces acute amnesia. The many case studies in which traumatized victims or witnesses demonstrated hypnotic hypermnesia would appear to support this view. However, this theory is challenged by the finding that recall for material learned under high emotional arousal increases over time, while material learned under low arousal correspondingly decreases (Butter, 1970; Walker & Tarte, 1963). In case studies, hypnotic hypermnesia can be explained by this fact alone. Whether hypnosis or time alone is responsible for a subsequent improvement in memory is difficult to determine.

Some authors (Cooper & London, 1973; Putnam, 1979a) have suggested that emotional arousal may be a crucial factor which explains why many studies have not found evidence of hypnotic hypermnesia. Although Rosenthal (1944) found that the emotional nature of the stimulus material was an important factor in producing hypnotic hypermnesia (that is, items associated with personal failure were more likely to be recalled under hypnosis), more recent studies which have induced stress in their subjects have not found arousal to affect recall (DePiano & Salzberg, 1981; Frain et al. 1984; Helwig, 1978; Zelig & Beidleman, 1979). Thus, at present there is very little evidence suggesting that arousal is an important factor affecting hypnotic hypermnesia. Unfortunately,

this issue is difficult to address experimentally due to ethical considerations and the fact that self-report and physiological measures of arousal do not always show a significant correlation (Smith, 1983).

Despite these problems, research is needed to address this important question. Further, it is important to understand the nature of arousal for violent versus nonviolent crimes, and for witnesses versus victims of crime. In the present study, it was expected that subjects in the most vivid stimulus medium condition might experience more arousal than those seeing the videotaped or slide presentation. Accordingly, subjects rated their degree of arousal following the crime enactment.

Other Relevant Findings in the Field of Forensic Hypnosis

Auditory Versus Visual Material

Very little has been discovered concerning the differential effects of using auditory versus visual stimulus material (DePiano & Salzberg, 1981; Timm, 1981). It is possible that hypnotic hypermnesia will be differentially affected by the senses involved in witnessing. People who primarily rely on auditory sources of information may experience hypnotic hypermnesia for visual but not auditory information, and vice versa. The present study only contained questions concerning visual material. Studies are needed which systematically compare auditory and visual stimulus material.

Central Versus Peripheral Detail

It is difficult to say that memory for central details are more important to an investigation than memory for peripheral details. A

license plate number might be considered to be a peripheral detail for someone witnessing a crime, but may be a critical part of the investigation. Likewise, descriptions of weapons may be central details, yet not be important to the police when they are left at the scene of the crime. Nevertheless, it is important to understand what kind of recall hypnosis enhances, if any.

A few studies have compared memory for central and peripheral detail. Wells and Leippe (1981) found that subjects who do well at remembering one type of detail may do poorly on the corresponding task. In their study of subjects in the waking state, those who accurately identified a thief after they had viewed a staged crime averaged significantly fewer correct answers on a structured test of memory that probed for peripheral details than did subjects who identified an innocent person. Geiselman et al. (1985) found hypnotic hypermnesia in their study to have applied to central and peripheral details. Sheehan and Tilden's (1984) hypnosis subjects displayed hypnotic hypermnesia for peripheral details, but not for central details. The subjects also made more errors concerning peripheral details, as compared to the waking subjects. However, Yuille and McEwan (1985) found that the more peripheral the details, the less likely they were to be recalled correctly.

Perhaps it is too simplistic to expect to find a clear-cut pattern on this factor. Further, even if researchers use the same definitions, applying these definitions in a reliable fashion across studies and stimulus materials would be very difficult. In the present study, only central details and actions were queried in the neutral questions. 'Central detail' was defined as a detail or action

directly related to a criminal action or the identity of the perpetrators.

Incidentally-Learned Material

Three studies (DePiano & Salzberg, 1981; Yuille & McEwan, 1985; Zelig & Beidleman, 1981) have asked questions concerning stimulus material which was incidentally learned--that is, material on which the subjects would not have expected to be tested. DePiano and Salzberg (1981) obtained clear-cut hypnotic hypermnesia for their stimulus material which was learned incidentally, was meaningful, and was given as part of a logical sequence. Yuille and McEwan (1985) used an incidental question with their subjects (a posted phone number on the videotape machine). No subjects in the hypnosis, relaxation, or control conditions recalled it correctly, nor were hypnosis subjects more likely to have seen the number. However, clearly a bottoming effect occurred. Zelig and Beidleman (1981) included incidentally-learned material (questions concerning the experimental context and description of the experimenter) in their study, but did not differentially analyze these questions.

The relevance of incidentally-learned material to the forensic context is questionable. One might expect that most witnesses of serious crimes--and hypnosis is primarily employed with serious crimes--would attempt to pay attention to the details, realizing that the police may ask for their assistance. However, details of the crime situation preceding the witness' awareness that a crime has occurred may be important to the investigation. The present study did not examine this factor.

Sex Differences

Although it is unlikely that sex differences in terms of hypnotic hypermnesia would be of the magnitude to lead police to only hypnotize members of one sex, this issue can be easily investigated and may add to our knowledge of the nature of hypnosis. Nevertheless, only a few studies have commented on the issue of sex differences.

DePiano and Salzberg (1981) did not find sex differences in terms of hypnotic hypermnesia. Sanders and Simmons (1983) did not find sex differences on the line-up identification task, and did not report on sex differences on the cued recall task. Geiselman et al. (1985), however, found that although males and females generally responded similarly, males made more incorrect responses than females. Although there does not appear to be much evidence for sex differences in hypnotic hypermnesia, the present study balanced the number of males and females in each group.

Time Delay

Despite Reiser's belief (cited by Dellinger, 1978) that memory that can be tapped by hypnosis is stored permanently and never deteriorates, Frain et al. (1984) found that hypnotic and waking memory deteriorate over time. The issue of whether hypnotic memory and waking memory deteriorate differentially over time has implications as to how long after the crime hypnosis would be helpful, if at all.

Concerning the length of time delay used between witnessing the event and being tested on the event, Frain et al. (1984) and Putnam (1979a) failed to find significant results. Hypnosis was no

more efficacious at one time than at another. Stager and Lundy (1985), however, found that high hypnotizable subjects who were hypnotized did significantly better on the delayed recall task than on the immediate recall task. Conversely, low hypnotizable subjects lowered their scores from immediate recall to delayed recall, one week later. Thomas and Phillips (1983) found some differential responding due to the time delay, but no main effects emerged. However, it should be noted that in most experiments, relatively short delays are used. The only study to use a lengthy time delay (Stalnaker & Riddle, 1932) obtained positive results, but was methodologically weak.

Type of Hypermnnesia Instructions

The most commonly used memory facilitation procedures are the TV screen technique, time regression instructions, and a general suggestion that memory will be facilitated. The TV screen technique is based on the assumption that people learn or memorize material in terms of a "mental movie." However, this may not be the case for many people.

Timm (1981, 1982, cited in Yuille & McEwan, 1985) found that a time regression technique with waking subjects was just as effective as hypnosis. Geiselman et al. (1985) found that their cognitive retrieval mnemonics group did significantly better than a control group and equally as well as the hypnosis group. Only one study (Yuille & McEwan, 1985) has systematically studied different memory techniques. Yuille and McEwan (1985) found that the recall of hypnosis subjects was enhanced with guided memory instructions but not with imagery instructions. Subjects in the relaxation

condition benefited more from imagery instructions than from guided memory instructions. Further studies are needed which systematically examine this factor. Hypermnnesia facilitation techniques may prove to be a fruitful area of research, since they would not be as controversial in the forensic setting as hypnosis.

Methodology

Control Conditions

Troffer and Tart (1964) demonstrated that bias and demand characteristics may favor the hypnosis group unless precautions are taken. They found that the voices of the hypnotists differed in cases in which hypnosis is employed as compared to a control condition. Orne (1972) suggested the use of simulating subjects as a quasi control group to eliminate bias. However, the simulating condition requires additional subjects, and it is possible that some subjects may slip into a trance. The problem of experimenter bias can be addressed by presenting the induction, instructions, and recall questions on audiotape.

Another problem concerns the possibility of subjects in a within-subjects design and hypnosis subjects in a between-subjects design suppressing their baseline performance in order to fulfill their, or the experimenter's expectations by showing hypermnnesia in the subsequent hypnosis condition (Barber, 1969). Zamansky, Scharf and Brightbill (1964) provided evidence of the suppression phenomenon, which may have confounded many of the studies in the literature (e.g., Cooper & London, 1973; Timm, 1981; Sanders & Simmons, 1983; Stager & Lundy, 1985; Stalnaker & Riddle, 1932). Zamansky et al. employed word-recognition thresholds and

manipulated the subjects' expectation as to whether hypnosis would be involved in the present session. They found that subjects depressed their baseline performance when they were informed that they would be subsequently asked to perform while under hypnosis. Grabowski (1988), however, did not find evidence of the suppression effects in a between-groups design.

Thus, subjects may depress their scores, and there is some indication that high hypnotizable subjects are more likely to do this than their low hypnotizable counterparts (Salzberg, 1960; Salzberg & DePiano, 1980). This is especially a problem since studies often use high hypnotizable subjects in the hypnosis group and low hypnotizable subjects in the control group (e.g., Timm, 1981). DePiano and Salzberg (1981) state that "less bias is introduced if subjects are initially recruited for the experiment without knowing that they will be hypnotized, and only subjects who are later hypnotized are made aware of this immediately prior to the induction" (p. 388). This procedure is also ecologically valid in that witnesses of crime are not generally aware that they will be hypnotized until they have been thoroughly interrogated in the waking state.

In the present study, a large number of subjects were screened concerning their hypnotizability level. A couple of months later, high and high-medium hypnotizable subjects were phoned, deceived by being told that their names were obtained from a list of introductory psychology students at the university, and asked to participate in the study. The description of the study made no reference to hypnosis. It was assumed that very few subjects would

guess that the two studies were related. To test this assumption, following the study subjects were asked whether they had suspected that hypnosis would be involved in the study.

Although some studies have used individualized hypnotic inductions (e.g., Geiselman et al., 1985; Timm, 1981), little is known concerning the effect of such inductions on hypnotic recall. It is possible that one induction procedure may be more effective than another. No study to date has systematically investigated the effect of different types of induction techniques. Accordingly, at this time it would be best for all forensic hypnosis researchers to use a standard induction such as the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962), since there is a large amount of normative data on this scale.

Control Groups

Research has indicated that relaxation (Pascal, 1949) and motivating instructions (Parker & Barber, 1964; Timm, 1981, 1982, cited in Yuille & McEwan, 1985) enhance recall. Timm (1981) felt that time regression might be the key to hypnotic hypermnesia and employed a waking group with time regression suggestions. What is not clear is whether hypnotic hypermnesia, when it occurs, is due only to relaxation, time regression, and/or motivating instructions. If this is the case, much controversy could be avoided by using these procedures in the forensic context instead of hypnosis. The two ways in which the possible effects of time regression and motivating instructions can be controlled are to use these procedures in the experimental and control conditions, or not use these procedures at all. The former method was employed in the

present study in order to give the hypnosis subjects every possible chance of demonstrating the hypnotic hypermnesia effect (that is, the interaction of hypnosis and these two procedures may add something of significance). By holding the presence of time regression and motivating instructions constant, one can be sure that significant results could not be mistakenly attributed to the effect of hypnosis, when in fact they are due to these other procedures.

In order to isolate the effect of hypnosis from the possible contribution of relaxation, the control condition consisted of subjects who listened to a relaxation exercise. The rationale of isolating the effect of hypnosis per se from that of the combination of hypnosis and relaxation, is that justifying the use of hypnosis when it is so controversial in the forensic setting would involve demonstrating that hypnosis is more effective than relaxation alone. An active relaxation procedure was used since high hypnotizable subjects may respond to a passive relaxation exercise by slipping into a hypnotic trance (Relinger, 1984).

Although Dhanens and Lundy (1975) did not find that having eyes open or closed affected recall, this factor can be easily controlled. When subjects are hypnotized and record their answers on paper, their eyes must be open, as must be the eyes of the waking subjects. If subjects are giving their answers orally, the experimenter has the option of having the subjects keep their eyes open or closed. In order to enhance the 'depth of the trance', it may be wise to have hypnosis subjects keep their eyes closed to reduce possible distractions. In the present study, subjects who were hypnotized

kept their eyes closed as they answered the questions by speaking into a cassette recorder microphone. Correspondingly, relaxation subjects also kept their eyes closed.

Ecological Validity (Generalization)

Critics of the experimental studies failing to find the hypnotic hypermnesia effect note that the laboratory is different from the forensic setting in many ways, one of which is often the nature of the stimulus material. Further, it is difficult to directly compare various experimental studies since different stimulus materials are used by different researchers. Relinger (1984) recommends that "future studies attempt to approximate the stimulus situation as closely as possible depending on the purpose of the experiment (I)n demonstrations of hypnotic hypermnesia for forensic purposes, the material should approximate an actual forensic situation for maximum generalizability" (p. 220). Since the use of forensic hypnosis is generally limited to cases involving serious crimes such as homicide, kidnapping, and rape, the stimulus material in an experiment should also consist of a serious, violent crime. Some researchers who use films of enacted crimes have used police and bank teller training films (Geiselman et al., 1985; Yuille & McEwan, 1985). Using a single crime (Sanders & Simmons, 1983) is preferable to using a film of several crimes (Griffin, 1980).

Ethical concerns regarding the use of violent enactments can be satisfied by warning the subjects of the nature of the enactment. However, researchers studying the effect of surprise may wish not to warn subjects that they will be seeing an enacted crime, and may have to use non-violent scenes.

Geiselman et al. (1985) found that hypnosis was superior to the waking state for their films with a high number of events per unit time, but not for films with a low density of events. Although both types of crimes are ecologically valid, the present study used a single enacted fatal stabbing with a high density of events to increase the chances of obtaining hypnotic hypermnesia. Subjects were warned that the scene contains violent content, and were given the opportunity to decline participation for that reason.

The type of subject used also warrants attention. Yuille and Cutshall (1986) found that 92% of the 41 articles on eyewitness testimony published in psychology journals between 1974 and 1982 have exclusively used college students. One difference between the case studies and experiments is the fact that the proportion of university students in each differs. Although Griffin (1980) notes that college students are an appropriate population to study since they are as likely as anyone else to witness a crime, generalization to populations other than college students is at this time questionable.

Other ecologically valid procedures cannot be easily implemented in a controlled laboratory study. For example, just as the police do not know the answer to most of the questions they ask, the interrogator should not know the answer to the questions at the time he/she asks them. However, this becomes problematic in terms of avoiding ceiling and bottoming effects, and scoring correct and incorrect responses. An alternate procedure, which was employed in the present study, is to use questions which are judged to be relevant by a police officer.

Although it is ecologically valid to use the entire range of hypnotizability, Yuille and McEwan (1985) believe that it is important to control for the level of hypnotizability in any study. Several studies (Pattie, 1937; Salzberg & DePiano, 1980; Sutcliffe, 1960; Zamansky, Scharf, & Brightbill, 1964) have indicated that high hypnotizable subjects, more so than low hypnotizable subjects, behave in a variety of ways which are thought to meet the experimenter's expectations. One advantage of only studying high hypnotizable subjects is that it is logical to assume that if hypnotic hypermnesia occurs, it should be most obvious in high hypnotizable subjects. Thus, although it is difficult to obtain large numbers of high hypnotizable subjects, employing this group should enhance the possibility of obtaining the hypnotic hypermnesic effect, even though generalization would be limited. Although almost 800 subjects were screened in the present study, some high-medium hypnotizable subjects were required to supplement the group of high hypnotizable subjects.

Witnesses and victims of crimes likely discuss the incident with significant others following the event and over the course of their involvement with the police. However, in most studies the experimenter asks the subjects not to discuss the study with others. Although not ecologically valid, this procedure is necessary in terms of the study not being "leaked" to other students, and in terms of students not comparing answers after the first recall where a second recall is employed. Researchers would be wise to enquire at the end of the study concerning whether the subjects discussed the study with significant others, and to what extent.

It is advisable to conduct a test of the 'depth of hypnosis' just prior to, or following the interrogation to determine the depth of trance at the time of questioning (Das, 1961; Relinger, 1984; Sanders & Simmons, 1983). This often occurs in forensic settings, for the interrogator wants to have some estimate of the depth of trance. The present study incorporated this check.

Although much can be done to increase the relevance of forensic hypnosis research to the investigative use of hypnosis, differences between the laboratory setting and actual cases will remain. The element of personal involvement in serious crimes cannot likely ever be simulated in the laboratory (Geiselman et al., 1985). Further, the element of surprise, which may contribute to the case study/experiment results conflict, is also difficult to incorporate into experiments utilizing violent enactments (Murray & Wells, 1982).

Methodological Considerations in the Present Study

The present study included many of the above methodological suggestions, including 1) taping virtually all of the instructions, the hypnotic induction, the relaxation exercise, and the questions in the second session where hypnotic subjects and control subjects were compared; 2) keeping the subjects ignorant concerning the fact the hypnosis would be used in the study, and only informing the subjects who were hypnotized of the hypnosis just prior to the induction; 3) using only high and high-medium hypnotizable subjects in both the hypnosis and relaxation groups; 4) using a standard hypnosis induction (HGSHS:A); 5) controlling for the effects of motivating instructions, time regression instructions, and relaxation; 6) having

hypnosis and relaxation subjects keep their eyes closed while speaking their answers into a microphone; 7) using ecologically valid stimulus material (a single enacted fatal stabbing with a high density of events); 8) using questions which were judged to be relevant by a police officer and having the officer construct the wording of the questions; 9) testing for depth of trance during the hypnosis recall session (and testing the relaxation subjects at the same time to evaluate whether they had inadvertently become hypnotized); 10) avoiding ceiling and bottoming effects by selecting the questions accordingly from a pilot study; 11) controlling for practise effects by having the relaxation subjects also answer questions at the second interrogation; 12) counterbalancing for sex differences; 13) counterbalancing for hypnotizability level; 14) avoiding a simple "yes" response bias in the misleading questions by asking for descriptions or specific details; 15) controlling the format of the neutral and misleading questions by only using cued recall questions; 16) controlling for the type of information queried (i.e, questions only concerning "visual" information); 17) controlling for the type of information queried on the cued recall questions by only asking about central details; 18) assessing differences in emotional arousal to the crime scene across experimental conditions; 19) assessing the single most important information in a criminal investigation (i.e., identification of the perpetrator); and 20) at the end of the study asking whether the subjects had discussed the study with others.

Rationale for the Present Study

Yuille and McEwan (1985) state: "(I)t may require the complexity and full dimensionality of a live event for hypnosis to prove effective" (p. 399). Yet, in their study, recall for the video event across groups was substantially higher than for the live context of the viewing room. However, since the stimulus material differed across these stimulus media, direct comparison was not possible. Before generalization from studies employing videotape or slide presentations of crimes can be made to the forensic context with a reasonable degree of confidence, studies are needed which systematically manipulate the stimulus media, while holding the stimulus material constant.

The present study is the first to directly compare the effect of the stimulus medium on forensic hypnotic hypermnnesia. Three different groups of subjects viewed the same enacted crime, either live, on videotape, or by means of a slide presentation. All subjects were initially interrogated in the waking state. One week later half the subjects were hypnotized prior to being questioned, and the remainder were tested in the waking state after listening to an active relaxation exercise.

The results of the study were expected to support the following hypotheses:

- 1) Live subjects would report the greatest arousal at T1 (that is, immediately following the crime enactment);
- 2) Live subjects would provide more correct and less incorrect responses than video and slides subjects at T1 on the cued recall questionnaire. If this was found to be the case,

subsequent analysis would reveal that these differences were due to the action details--the groups would not differ regarding descriptive details;

- 3) Live subjects would experience greater enhanced recall (more correct and less incorrect responses) from T1 to T2 (that is, one week following the crime enactment). If this was found to be the case, subsequent analysis would reveal that these differences were due to the action details--the groups would not differ regarding the descriptive details;
- 4) Hypnosis would enhance recall (more correct and less incorrect responses) from T1 to T2 as compared to the relaxation group;
- 5) There would be an interaction between the independent variables--the live/hypnosis group would demonstrate the greatest enhancement of recall (more correct and less incorrect responses) from T1 to T2;
- 6) The hypnosis groups at T2 would be misled on the misleading questions to a greater extent than the relaxation group; and
- 7) The hypnosis group would make less correct and more incorrect responses than the relaxation control group on the two facial recognition tasks.

Method

Subjects

The subjects were selected on the basis of their hypnotizability scores from a group of 786 subjects who reported having good eyesight. They received course credit for their participation.

The subjects were 101 introductory psychology students. One hundred and twenty subjects were invited to participate in the study (20 subjects in each of the six groups). Nineteen subjects either did not show up for one of the two experimental sessions, or did not speak loud enough at T2 into the audio cassette microphone for their responses to be heard. As a result, assignment to groups was as follows: 1) live/hypnosis group (18 subjects); 2) live/relaxation control group (16 subjects); 3) video/hypnosis group (17 subjects); 4) video/relaxation control group (19 subjects); 5) slides/hypnosis group (16 subjects); and 6) slides/relaxation control group (15 subjects).

Procedure

Screening for hypnotizability

Eight sessions were conducted in which subjects were screened in terms of their level of hypnotizability. Seven hundred and eighty-six introductory psychology students were tested in groups of about 100 in a large theater. An audiotaped version of the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A; Shor & Orne, 1962) with a female's voice was played. Following the tests of hypnotizability, subjects were asked to record the manner in which they responded to the suggestions, according to the self-scoring system of the test. They were also asked to circle their name on the scoring booklet if they would not want to be hypnotized again. Subjects were informed that they might be contacted for other studies, either involving hypnosis or not.

Two months later, the subjects scoring the highest on the HGSHS:A (excluding those subjects who indicated that they would

not want to be hypnotized again) were phoned and asked to participate in two sessions (see Appendix A). The subjects were not told that the study was related to the previous screening for hypnotizability, and were deceived into believing that the experimenter had obtained their name from a list of introductory psychology students. This was done to avoid a possible suppressing of recall in the waking condition (Zamansky et al., 1964).

The subjects were matched for sex and hypnotizability level, and randomly assigned to one of the six cells (three kinds of stimulus medium and two forms of interrogation state at the second testing). Subjects were phoned one day prior to the first session to remind them of the appointment.

Interrogation #1

Each format of presentation (live, video and slides enactments) was only shown once, and subjects were invited to one of the three stimulus media conditions. The subjects who witnessed the live enactment were seated near the front of the room in which the enactment was staged (the seating of each subject was randomly determined). The subjects were then informed that they were about to watch a performance by some actors (theatrical students), depicting a scene involving a teaching assistant (TA) and two students after an exam (see Appendix B). The TA was identified for the students. The subjects were warned that there would be violence in the drama, but not more than can be typically seen in prime-time television. They were informed that they could decline participation in the study without penalty.

In order to reduce the likelihood of subjects laughing or being disruptive in other ways during the crime enactment, this potential problem was addressed with the subjects (see Appendix B). Further, two research assistants were present. It was assumed that the presence of three persons involved with the study would decrease, or prevent disruptive behavior, and in fact, no disruptive behavior occurred. Subjects were told to pretend that the incident was actually occurring. They then saw the following scenario:

A male teaching assistant (TA) is sitting on a table at the front of a theater-style classroom. Two stacks of papers are to his left and his backpack is on his right. Two students (one male and one female) walk up to him. The female student stands at his left and the male stands at his right. The female student has two sheets of paper (exams), one of which is crumpled. The male student holds a jacket under one of his arms. The female is the first to speak:

- Female- "Here you go." The female student places the papers on the table. "Do you have the answer sheet for us?"
- TA- "No. I can't go through with it."
- Female- "You promised to hand in exams for us."
- TA- "I'm sorry but I changed my mind."
- Male- "Look." The man takes a pill container from his front right pocket. "Here's your uppers." He hands the drugs to the TA, who reluctantly takes them in his hand. "Now write those tests for us."
- TA- "I told you, I'm not going to do it." The TA places the drugs on the table. "I could get caught."
- Male- "You don't want to go back on this deal!"
- TA- "Well I just did."
- Female- "You fuckin' bastard."

The TA grabs the female student. The male student angrily grabs the TA and pulls him away. The TA reaches into his backpack, pulls out a knife, and slashes the male student on the left upper arm. The female student grabs the TA from behind while the male grabs the TA's arms from the front. The female student grabs the knife from the TA's hand and stabs the TA in the back. She holds the knife there

briefly while the TA arches his back in pain. The TA falls to the floor as the male student slowly releases him. The male student takes the knife from the female student's hand and puts it in his back right pocket.

Male- "Get the uppers."

The female student puts the drugs into the TA's backpack.

Female- The female student sees the TA struggling to get up and says "Do something" to the male student, while pointing at the TA.

The male student strangles the TA. Meanwhile the female student straightens out the crumpled test paper and puts both exam papers on the bottom of the pile of papers nearest the end of the desk. The male student finishes strangling the TA and the two students run off--the male student takes his jacket and the female student takes the backpack.

The experimenter then came into view and informed the students that they would be asked to rate the level of arousal they experienced upon witnessing the incident (see Appendices C and D). After the ratings were completed, the experimenter played audiotaped contextual instructions which asked the students to imagine that the incident was not staged (see Appendix E). The audiotape also outlined the series of events which would follow the crime. Subjects were then played task-motivating instructions (Appendix F). Finally, they were given instructions (see Appendix G) to complete the questionnaire consisting of cued recall questions (see Appendix H). Subjects were instructed to answer "don't know" if they did not know an answer to a question.

The questionnaire contained 30 cued recall questions concerning visual aspects of the three actors and their actions. All of the questions concerned central details, and were classified as descriptive or action questions. Seven questions were deleted from

the analysis to ensure that subjects in all three groups had an equal chance of answering the questions correctly (see "Materials" section). Upon completing the questionnaire, the subjects were thanked and reminded to return the following week (see Appendix I). They were asked not to discuss the experiment with anyone.

Subjects participating in the videotaped and slides versions of the enactment did so under the same experimental conditions. In order to ensure that the videotape and slide presentations were identical to the live enactment, the live enactment was videotaped and photographed. The sound track from the videotape accompanied the slide presentation. The advantage of this procedure is that the videotape and slide presentation of the crime were as identical as possible to the live enactment, containing the same stimulus material.

Interrogation #2

Subjects were phoned one day prior to the second session and were reminded of the experiment. One week after being exposed to the stimulus material, subjects were questioned in a language laboratory. The questions were individually administered to each subject by means of audiotapes played over headphones. Partitions separated the subjects, reducing audio and visual distractions. Half the subjects were questioned after being hypnotized and half were questioned in the waking state after hearing an active relaxation exercise.

Upon arriving at the language laboratory, subjects were told that they would again be questioned concerning their memory of the enacted crime (see Appendix J). The hypnosis subjects listened to

recorded instructions explaining that they were going to be hypnotized prior to being interrogated (Appendix K). An individualized audiotaped version of the induction of the HGSHS:A with a male's voice was then played (see Appendix L). Relaxation subjects heard instructions explaining that they would hear a relaxation exercise (see Appendix M), and the relaxation exercise was then played (see Appendix N). Subjects in both groups heard general instructions (see Appendix O), and the same task-motivating instructions given at T1 (see Appendix F). They were then given time regression instructions (see Appendix P), "taking them back" to the time of the crime enactment. A recording containing the cued recall questions previously given (see Appendix H), and seven cued recall misleading questions (see Appendix Q) was then played (one misleading question was not included in the analysis due to a procedural problem). Subjects would hear a question and have 10 seconds to respond. The subjects' responses were recorded on audiotape.

After answering the cued recall and misleading questions, the subjects were instructed to open their eyes and attempt to identify the male perpetrator from the pictures shown (see Appendix R). They were presented with an array of eight black and white photographs of males (see Appendix S). A picture of the male perpetrator was present. The subjects were asked to: 1) verbalize the number which corresponded to the picture of the male perpetrator; 2) report that a picture of the perpetrator was not present; or 3) respond by saying "don't know." The same procedure was followed concerning the pictures of possible female

perpetrators. The female perpetrator's picture was present (see Appendix S).

The subjects were then given three tests of hypnotizability (finger lock, communication inhibition, and eye catalepsy) for the purposes of providing an approximate measure of the depth of the trance for the hypnosis subjects, and to ensure that relaxation subjects did not slip into a hypnotic trance (see Appendix T). Subjects were then brought out of the hypnosis and relaxation states (see Appendices U and V) and were asked to complete a post-experiment questionnaire (see Appendices W, X, and Y). The questionnaires included items concerning whether the subjects had anticipated the involvement of hypnosis in the experiment, whether they discussed the experiment with anyone, and whether they felt that they had been hypnotized prior to and during the second session. It also queried the subjects concerning their responses to the three tests of hypnosis. Finally, the subjects were debriefed concerning the purpose of the study and the reason for the deception (see Appendix Z).

Materials

A 3/4 inch videotape camera was positioned behind the subjects. Simultaneously, two 35mm cameras were positioned at the same place in the room and alternately took colour slides every half second. A series of 30 slides, ranging in duration from 0.5 to 3.0 seconds, were transferred to 3/4 inch video cassette and the sound track from the videotape was added. The slides, and their duration, were chosen in such a manner as to achieve a presentation which was as similar as possible to the live and videotaped

versions. The slides and the videotape were projected on a large screen (8' 1" wide by 5' 6" high). The volume of the audiotaped instructions and the illumination of the room was held constant throughout the study.

The cued recall questions were selected on the basis of a pilot study, and an overall correct response rate of 42% in the present study indicates that bottoming and ceiling effects were avoided. In order to ensure that the opportunity to see the stimulus material corresponding to the questions was essentially the same for the slide presentation as it was for the videotape and live presentations, two raters examined the stimulus materials. The raters ensured that subjects in each condition were exposed to key aspects of the stimulus material for the same length of time, and that the colors of clothing and objects were comparable across stimulus medium conditions. Any questions considered by either or both of the raters to have given one group an advantage over another in terms of answering the questions, were deleted from the analysis. Seven of the 30 questions, accordingly, were deleted.

Normative data on the HGSHS:A

The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) was adapted for group administration from the individually-administered Stanford Hypnotic Susceptibility Scale, Form A (SHSS:A) of Weitzenhoffer and Hilgard (1959). Normative studies on the HGSHS:A from the United States (Coe, 1964), Canada (Laurence & Perry, 1982), Australia (Sheehan & McConkey, 1979), and Germany (translated into German; Bongartz, 1985) show similar psychometric properties despite the different socio-cultural

contexts. Results indicate that it does not make a difference whether the test is read to the subjects or is on audiotape (Bongartz, 1985).

The mean score on the HGSHS:A in the four countries mentioned above ranged from 5.45 to 7.39. These differences are not statistically significant (Bongartz, 1985). The variance for the German study (S.D.=2.43) was significantly lower than for the American study (S.D.=3.04), the Australian study (S.D.=2.95), and the Canadian samples (S.D.=3.28; S.D.=3.43). The distribution of scores is generally similar across the various studies.

Correlations of item difficulty among these four studies ranged from .92 to .95, indicating a very high degree of consistency in the difficulty of the items. The reliability of the HGSHS:A is .62 for the German sample, .76 for the Australian sample, .80 for the American sample, and .84 for the Canadian sample.

Bongartz (1985) retested one of his samples of subjects on a German version (Bongartz, 1980, cited in Bongartz, 1985) of Weitzenhoffer and Hilgard's (1962) Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C). The correlation between the two tests was $r=.57$. This compares to reported predictive validity scores from various studies of $r=.72$ (Weitzenhoffer & Hilgard, 1962), $r=.60$ (Coe, 1964), $r=.59$ (Evans & Schmeidler, 1966), and $r=.53$ and $r=.83$ (Sheehan & McConkey, 1979).

Abbreviated HGSHS:A

The present study tested the hypnotic responsiveness of the hypnosis and waking subjects after the second questioning. It was felt that a test of hypnosis should be employed for the purpose of

checking to see whether the hypnosis subjects were in fact hypnotized, and to ensure that the relaxation subjects did not inadvertently become hypnotized. Further, it was hoped that such a test could provide an estimate of the depth of hypnosis.

For the sake of time, a short test of hypnotizability was needed. Further, one which is highly correlated with the HGSHS:A, SHSS:A, or SHSS:C was desired since some subjects score highly on one test of hypnosis, but not on others. Finally, a test was sought which would not disrupt other hypnosis or waking subjects, and could be self-scored.

An extensive search of the literature was conducted to find such a test of hypnotizability. None was found. The Hypnotic Induction Profile (HIP; Spiegel & Bridger, 1970) requires little time to administer, but requires individual input from a hypnotist, is not self-scoring, and correlates poorly with the SHSS:C. The Stanford Hypnotic Arm Levitation and Induction Test (SHALIT; Hilgard, Crawford, & Wert, 1979) is also brief, but must be scored by another person and correlates poorly with the SHSS:A. The Barber Suggestibility Scale (BSS; Barber, 1965b) is not entirely self-scored, and the Creative Imagination Scale (CIS; Wilson & Barber, 1978) is poorly correlated ($r=.28$) with the HGSHS:A. The SHSS:A and the SHSS:C are too lengthy to use for this purpose.

Thus, in the present study, three items (finger lock, communication inhibition, and eye catalepsy) from the HGSHS:A were employed. Hypnotic subjects were expected to pass significantly more items than their relaxation counterparts.

Treatment of the Data

The 6 misleading questions, the 2 facial recognition tasks, and 6 of the 23 cued recall questions (numbers 22, 23, 26, 28, and 30) were scored as correct, incorrect, or "don't know". On 18 of the cued recall questions, half a point could be earned. For example, if a subject was marginally accurate concerning a perpetrator's height, the subject earned half a point since this information would be somewhat helpful to the police.

The HGSHS:A, the cued recall questions (at T1 and T2), the misleading questions, and the facial recognition items were scored blindly, and interrater reliability scores were tabulated. Of the 786 HGSHS:A booklets completed at the screening, 171 (22%) were scored independently by two raters. Interobserver reliability (IOR) accuracy (agreements/ agreement plus disagreements) was 98.2%. IORs were completed on 10 of the questionnaires from the first interrogation session (10%), and agreement was 95.7%. IORs were also obtained on 10 audiotapes from the second session (10%), and overall agreement was 94.8% (92.6% for neutral questions, 98.3% for misleading questions, 100.0 % for facial recognition items). Of the 5454 responses in this study, 1.1% were not scoreable (for example, a subject may have spoken too quietly into the microphone) and were not included in the analysis.

Results

A 3x2 before-after research design with matching (for sex and hypnotizability score) was employed. The ANOVAs and MANOVAs were run using SAS Procedure GLM. Type III Sums of Squares were utilized, allowing the use of unequal cell sizes for the MANOVAs and

ANOVAs. Alpha was set at .05. Student-Newman-Keuls tests were utilized for post hoc comparisons. In all cases where arousal ratings were used as a covariate, the p values for the covariate were greater than .05, indicating that the covariate did not significantly alter the analyses.

Homogeneity of variance was assessed using Cochran's C test. In no cases was the p value significant at the .05 level. This indicates that the variances were sufficiently "equal." Outliers were detected via the Wilks-Shapiro test. Of 95 sets of data tested, outliers were detected in 13 of the sets (a total of 18 outliers). Outliers were not deleted or transformed since they did not deviate greatly from the remainder of the data. In 33 of the 95 tests, the data was not normally distributed (alpha was set at .05). This appears to have been due to the limited range of possible responses, as the more limited the range, the less likely the data set was to be normally distributed. It should be noted, however, that the statistical tests employed are robust to violations of normality.

Details of the primary statistical tests are provided in Appendix AA.

Main Investigative Questions

The primary analyses can be grouped into seven questions:

1. Are there significant differences among the stimulus medium groups in their self-reported level of arousal immediately following the presentation of the crime scene? A one-way ANOVA indicated that the factor of stimulus medium was significant ($p=.0010$). The Student-Newman-Keuls test indicated that the live group (mean=4.618) had rated their level of arousal to be

significantly greater than the video group (mean=3.694) and the slides group (mean=3.548), and the later two groups did not differ significantly.

2. Are there significant differences among the stimulus medium groups in their total scores (action plus descriptive scores) correct and incorrect on the 23-item cued recall questionnaire at the first questioning? A one-way MANCOVA was run with arousal level as the covariate. The factor of stimulus medium was significant ($p=.0001$). When the two dependent variables were analyzed individually, only the dependent variable of total correct was significant ($p=.0001$). The live group (mean=11.353) made significantly more correct responses than the video group (mean=9.889), which made significantly more correct responses than the slides group (mean=7.903; see Figure 1).

3. Are there significant differences among groups in terms of correct and incorrect scores at the first questioning on the 9 action and 14 descriptive questions? A one-way MANCOVA was run with arousal level as the covariate. The factor of stimulus medium was significant ($p=.0001$). When the four dependent variables were analyzed separately, only the dependent variables of action correct ($p=.0001$) and descriptive correct ($p=.0001$) were significant. For the dependent variable of action correct, the live (mean=5.206) and video (mean=5.083) groups did not differ, but both made significantly more correct responses than the slides group (mean=3.597). For the dependent variable of descriptive correct, the live group (mean=6.147) made significantly more correct responses

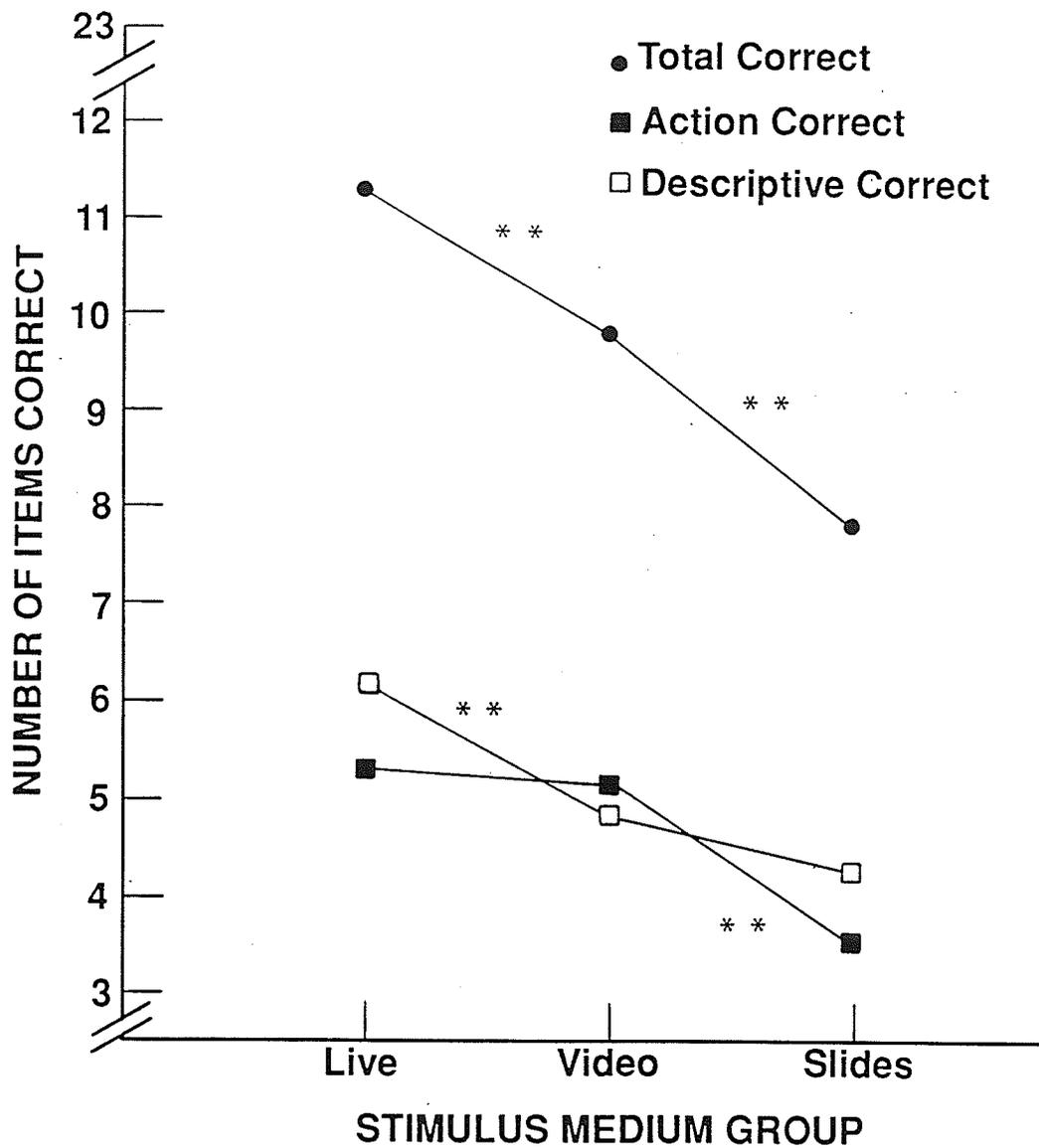


Figure 1. The average number of total, action, and descriptive items correct on the 23-item cued recall questionnaire immediately following the crime presentation as a function of stimulus medium (“***” denotes statistical significance at the .01 level).

than the video (mean=4.806) and slides (mean=4.290) groups, which did not significantly differ (see Figure 1).

4. Are there significant differences from T1 to T2 among the groups in their total scores correct on the 23-item cued recall questionnaire? A two-way repeated measures ANCOVA was run with arousal level as the covariate. There were no significant differences. The overall mean at T1 was 9.77 and the corresponding number at T2 was 9.68.

Are there significant differences from T1 to T2 among the groups in their total scores incorrect? A two-way repeated measures ANCOVA was run with arousal level as the covariate. The factor of time (from T1 to T2 collapsing across stimulus medium and interrogation state) was significant ($p=.0319$), indicating that there was an overall significant increase in incorrect responses from T1 (mean=6.1881) to T2 (mean=6.4158).

5. Are there significant differences from T1 to T2 among the groups in terms of the action and descriptive scores correct and incorrect? Two-way repeated measures ANCOVAs were run with arousal level as the covariates. There were no significant differences. Of note is the finding that the hypnosis group did not recall more than the relaxation group from T1 to T2 in terms of total, action, or descriptive items correct.

6. Are there significant differences among groups on the misleading questions in terms of the number of questions on which they were misled and the number of questions on which they were not misled? A two-way MANCOVA was run with arousal level as the covariate. The factor of hypnosis/relaxation was significant

($p=.0398$). When the two dependent variables were analyzed independently, only the dependent variable of responses on which the subjects were misled was significant ($p=.0147$). The hypnosis group (mean=2.353) made significantly more responses indicating that they were misled than the relaxation group (mean=1.600; see Figure 2).

The factor of stimulus medium was not significant ($p=.1924$). However, when the two dependent variables were analyzed separately, the dependent variable of questions on which they were not misled was significant ($p=.0497$). The live (mean=0.882) and video (mean=0.944) groups did not differ, but both had significantly more responses in which they were not misled than the slides group (mean=0.258; see Figure 3).

The interaction was significant at the $p=.0061$ level. Separate analyses revealed that the dependent variable of misled was significant ($p=.0172$), as was the dependent variable of not misled ($p=.0271$). In terms of being misled, relaxation subjects were misled more with the less vivid stimulus medium (slides), and hypnosis subjects were misled less often in the slides condition (see Figure 4). In terms of responses on which the subjects were not misled, the hypnosis and relaxation groups did similarly in the live and slides conditions, but the hypnosis subjects had far fewer responses which indicated that they were not misled in the video condition (see Figure 5).

7. Are there significant differences among groups on the facial recognition tasks in terms of: 1) the number of correct identifications; 2) the number of incorrect identifications (where an

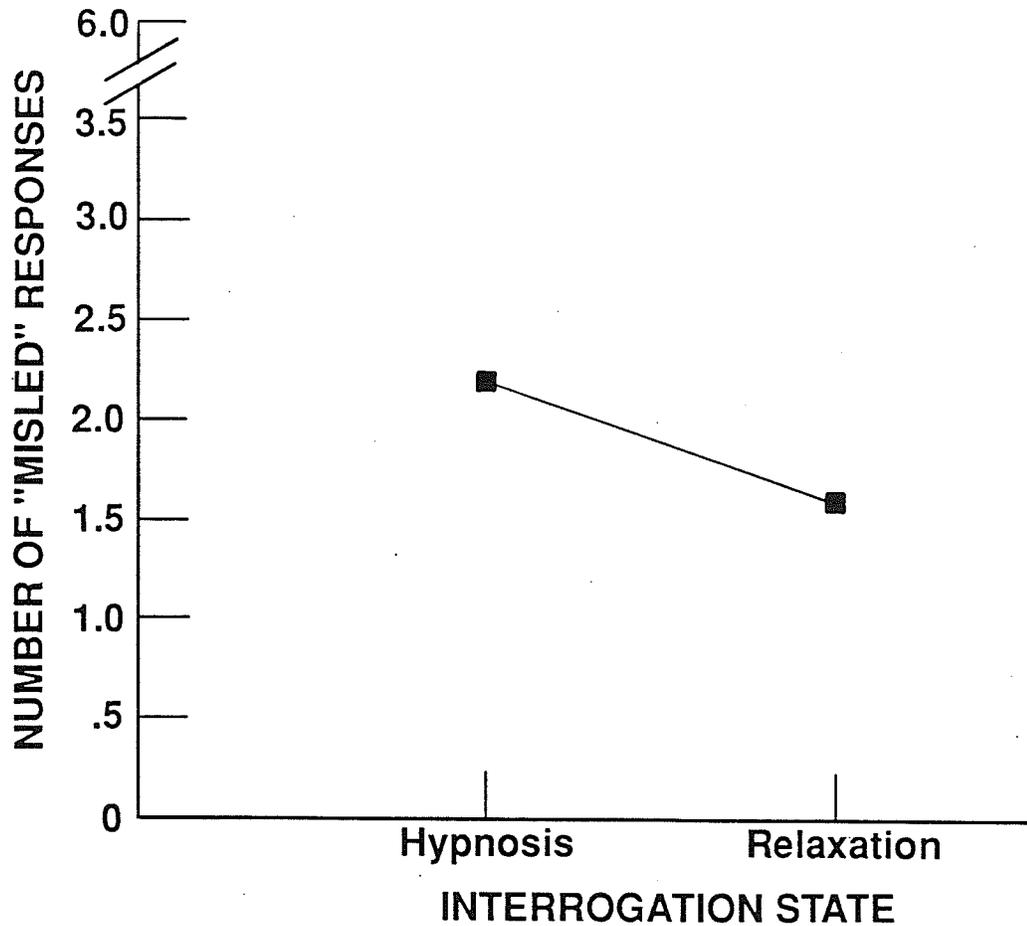


Figure 2. The average number of misleading questions on which the subjects were misled as a function of interrogation state. The difference between groups is significant at the .0147 level.

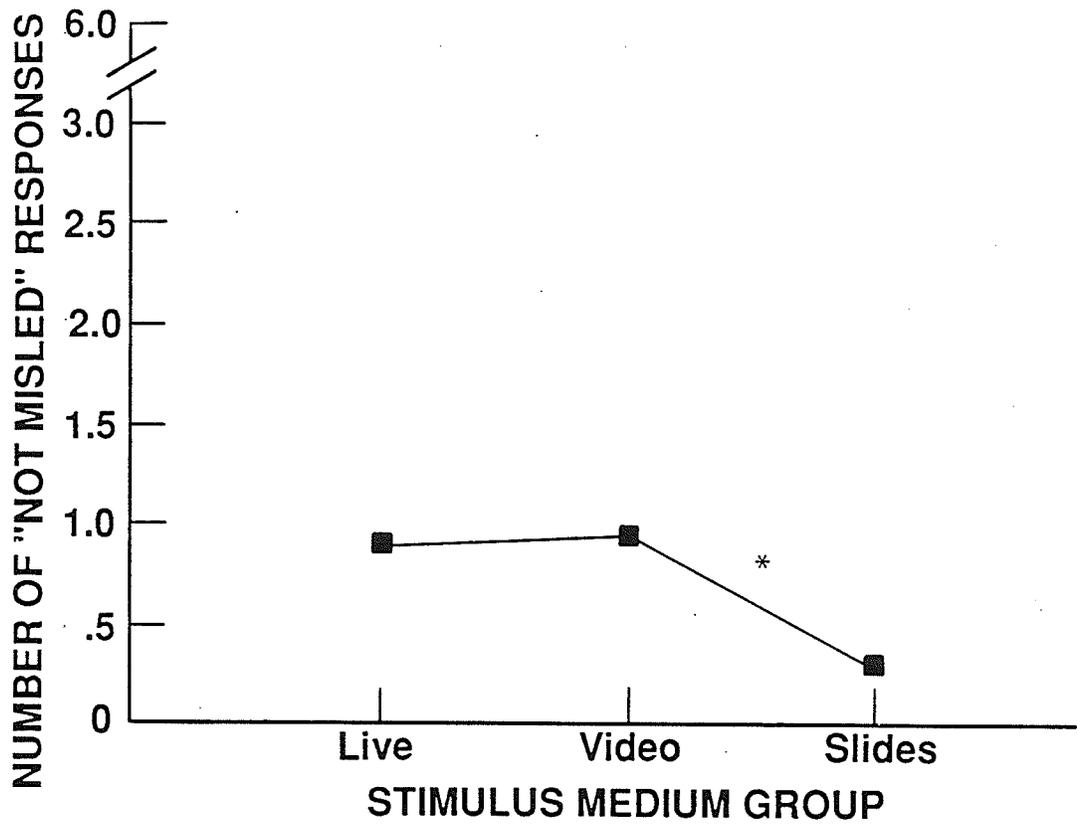


Figure 3. The average number of misleading questions on which the subjects were not misled as a function of stimulus medium ("*" denotes statistical significance at the .0497 level).

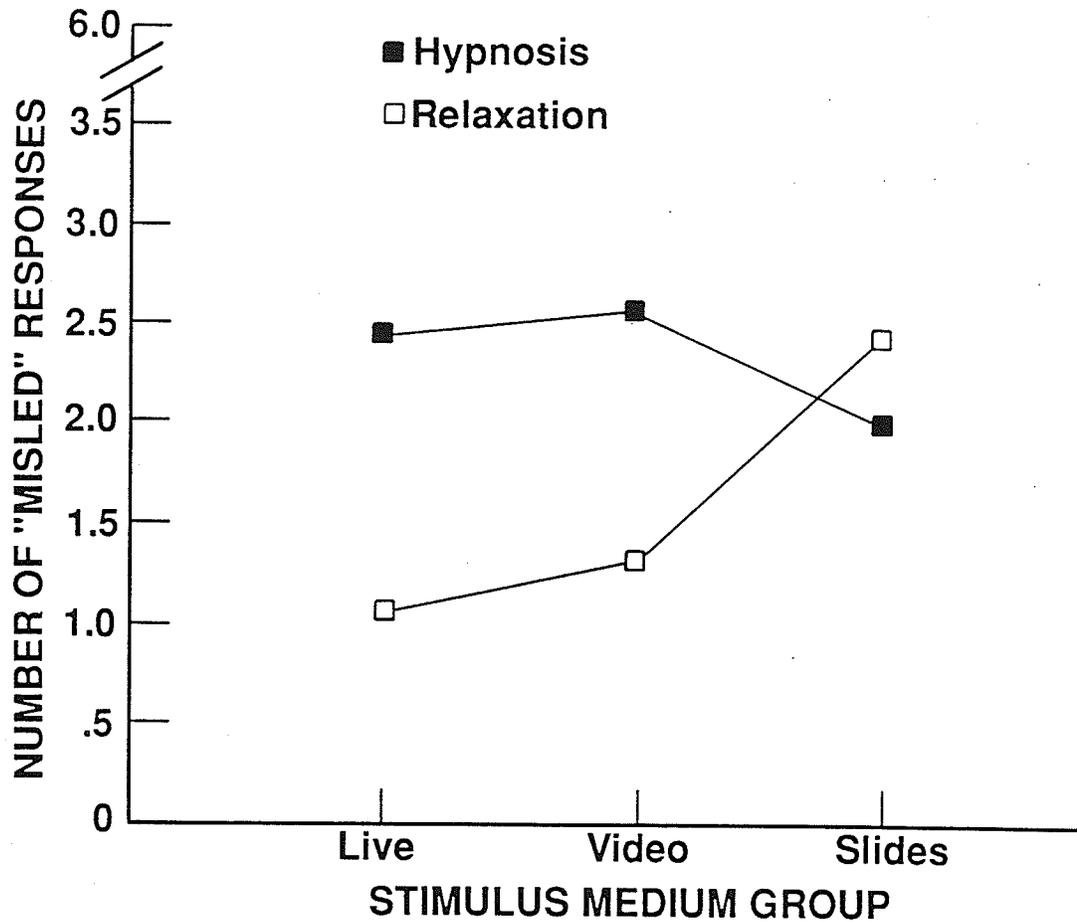


Figure 4. The average number of misleading questions on which the subjects were misled as a function of stimulus medium and interrogation state. The interaction is significant at the .0172 level.

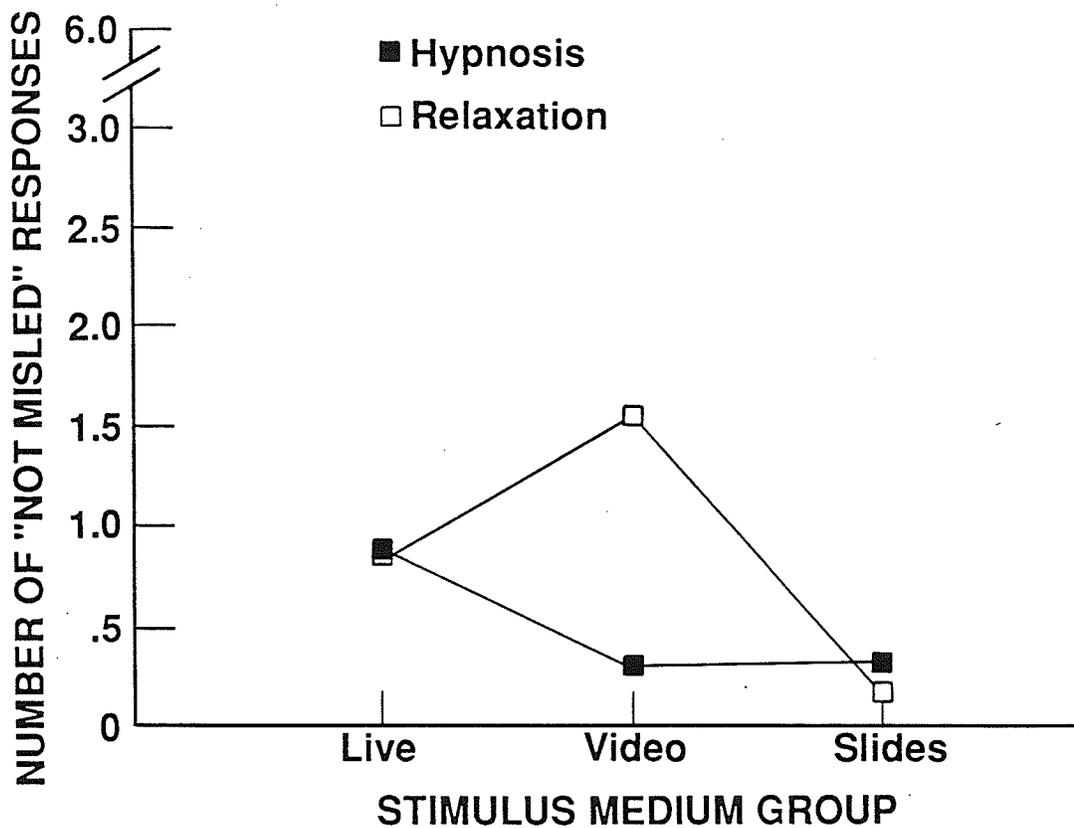


Figure 5. The average number of misleading questions on which the subjects were not misled as a function of stimulus medium and interrogation state. The interaction is significant at the .0271 level.

innocent person is incorrectly identified as being the perpetrator); and 3) the number of responses where the subjects said that the perpetrator's picture was not present? A two-way MANCOVA was run with arousal level as the covariate. The factor of hypnosis/relaxation was significant ($p=.0135$). When the three dependent variables were analyzed independently, the dependent variable of correct identifications was significant ($p=.0239$), as was the dependent variable of the number of incorrect identifications ($p=.0033$). For the dependent variable of correct identifications, the hypnosis group made significantly less correct responses (mean=0.451; a 23% correct response rate) than the relaxation group (mean=0.700; a 35% correct response rate; see Figure 6). For the dependent variable of incorrect identifications, the hypnosis group made significantly more incorrect responses (mean=0.980; a 49% incorrect response rate) than the relaxation group (mean=0.580; a 29% incorrect response rate; see Figure 7).

The factor of stimulus medium was significant ($p=.0001$). When the three dependent variables were analyzed independently, the dependent variable of correct responses was significant ($p=.0001$), as was the dependent variable of the number of incorrect responses ($p=.0004$). For the dependent variable of number correct, the live group (mean=0.971) had significantly more correct than the video (mean=0.500) and slides (mean=0.226) groups, which did not differ significantly (see Figure 8). For the dependent variable of number incorrect, the live group (mean=0.441) had significantly less errors than the video group (mean=0.778), which in turn had significantly less errors than the slides group (mean=1.161; see Figure 9).

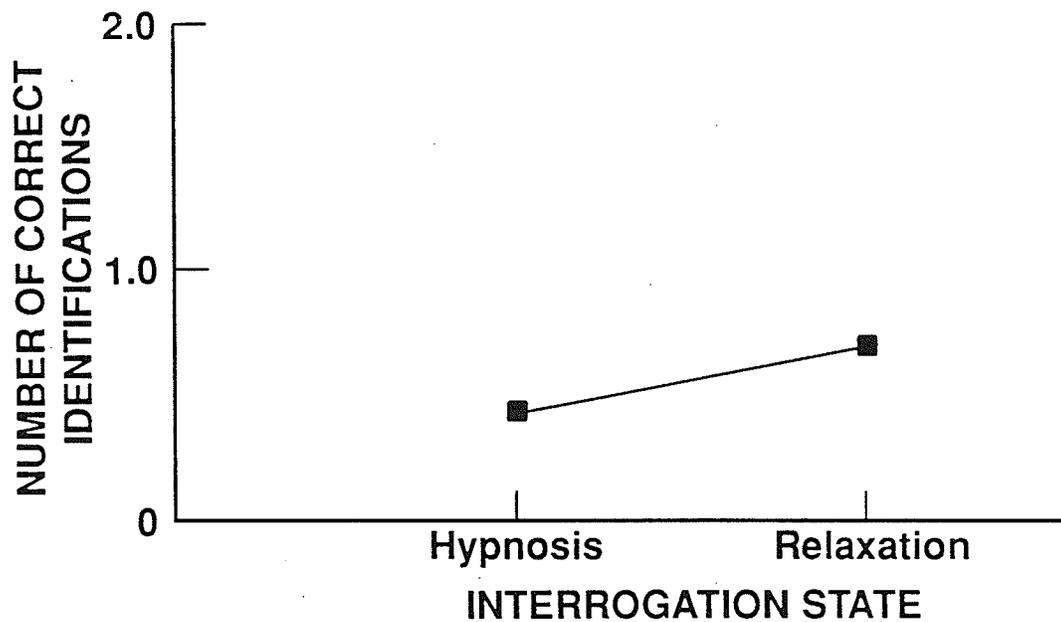


Figure 6. The average number of correct identifications on the two-item facial recognition task as a function of interrogation state. The difference between groups is significant at the .0239 level.

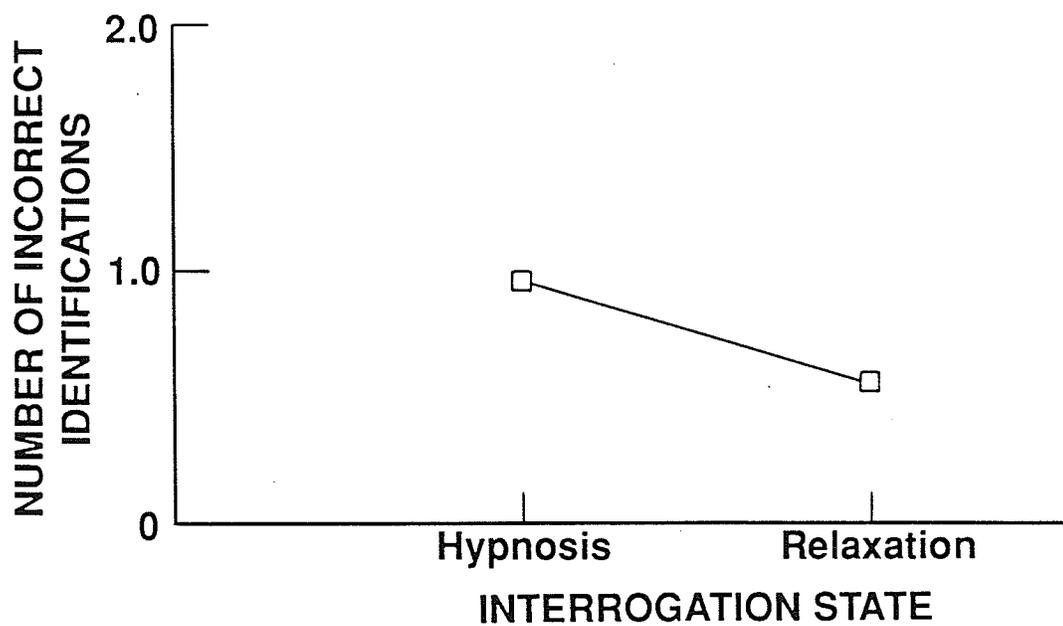


Figure 7. The average number of incorrect identifications on the two-item facial recognition task as a function of interrogation state. The difference between groups is significant at the .0033 level.

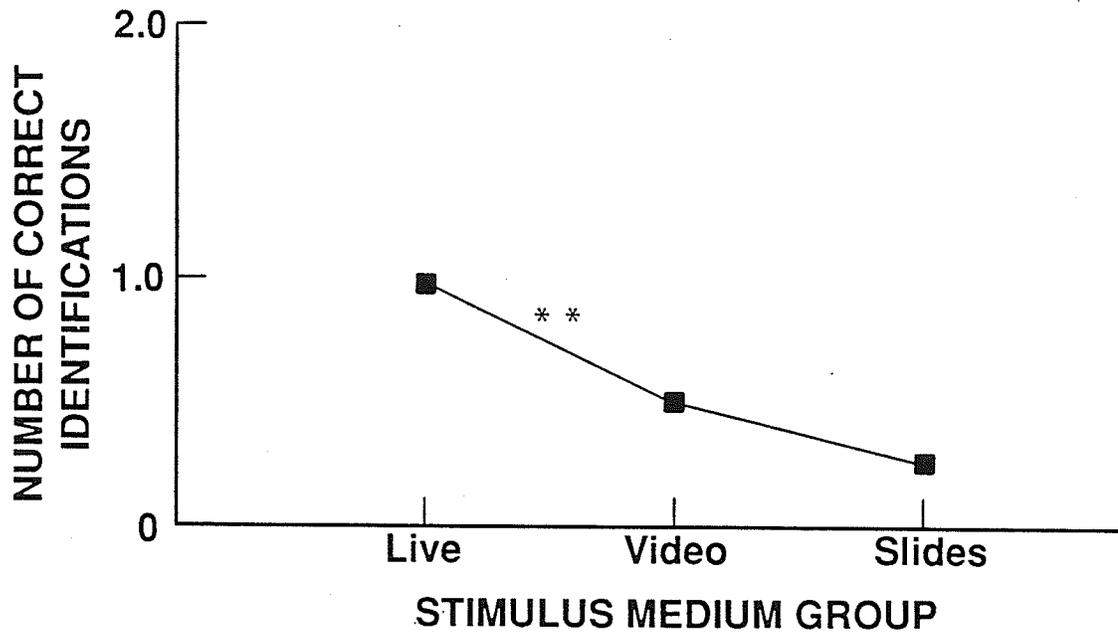


Figure 8. The average number of correct identifications on the two-item facial recognition task as a function of stimulus medium ("**" denotes statistical significance at the .0001 level).

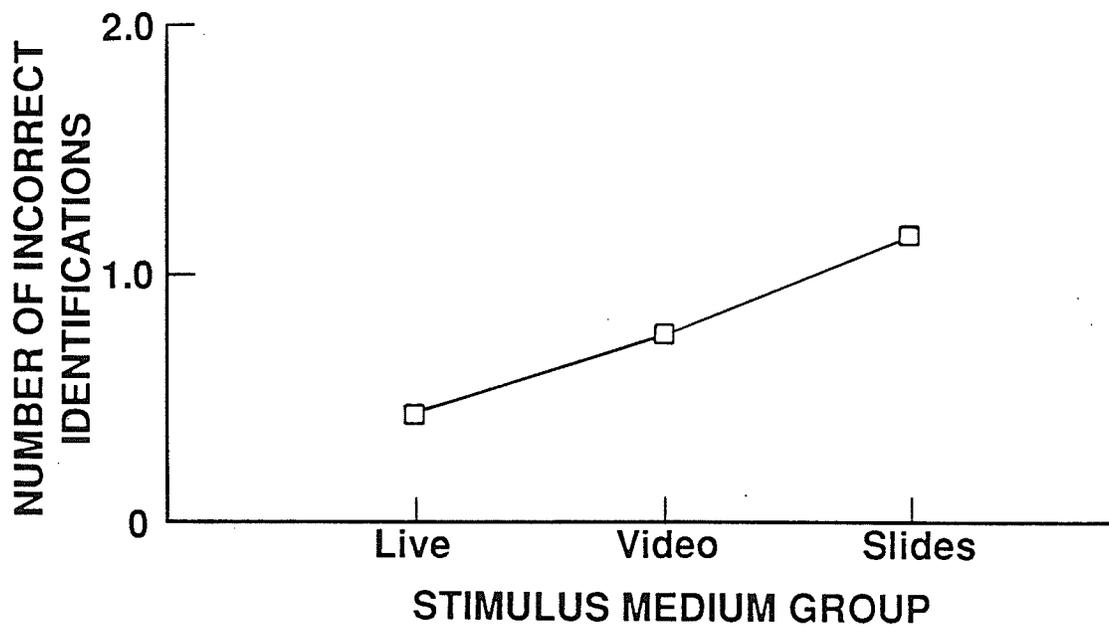


Figure 9. The average number of incorrect identifications on the two-item facial recognition task as a function of stimulus medium. The differences among the three groups are significant at the .0004 level.

Analyses to Check on the Methodological Controls

1. Were the six groups equivalent in terms of their average hypnotizability scores on the HGSHS:A at the screening? Even though subjects were counterbalanced on this variable, it is possible that the groups may have differed due to subjects dropping out. A two-way ANOVA did not reveal significant differences among the groups. Mean hypnotizability scores ranged from 8.4 to 8.6 for the six cells. In terms of individual subjects in all groups, the scores ranged from 7 to 12. According to the categorization system of Laurence and Perry (1982), these subjects would be considered high-medium to high hypnotizable subjects.

2. Are there significant differences among the groups in terms of their score on the three-item HGSHS:A following the second questioning? A two-way ANOVA indicated that only the factor of hypnosis/relaxation was significant ($p=.0063$). The hypnosis group had a greater score (mean=1.9) on the three-item test than the relaxation group (mean=1.2), where "3" was the highest, and "0" was the lowest possible score. Thus, the hypnosis group responded more as if they were hypnotized.

3. Are there differences among the six groups in terms of feeling they were hypnotized 1) prior to; and 2) during the second questioning? A chi square (SPSS-X crosstabs) was used, since the data are not continuous. The chi square was significant ($p=.0000$) in both cases. Significantly more hypnosis subjects said they felt they were hypnotized prior to and during the questioning than the relaxation subjects. Conversely, more relaxation subjects reported feeling that they were not hypnotized prior to and during the

questioning (the absolute value of the standard residuals ranged from 2.2 to 2.9).

The results of the other questions from the post-experiment questionnaire are presented in Appendix BB.

Non-Statistical Significance of the Data

Where statistically significant results were obtained, the magnitude of the data was considered in terms of whether the results could be considered to be forensically significant. This consideration is based on the premise that statistically significant results and forensically significant change in recall may not coincide. That is, a statistically significant change in recall which is of a very small magnitude may not warrant the use of whatever memory facilitation procedures were utilized. Only one significant result clearly appeared to be of such minimal magnitude as to not be forensically significant: the overall increase in the number of incorrect responses from T1 (6.2) to T2 (6.4).

Summary

The major results can be summarized as follows:

- 1) Hypnosis subjects did not improve their recall, or make more errors from T1 to T2 compared to the relaxation control group;
- 2) Hypnosis subjects were misled more than the relaxation subjects on the misleading questions (this was the case for the live and video groups, but not for the slides group);
- 3) Hypnosis subjects made less correct responses, but more incorrect responses than their relaxation counterparts on the facial recognition tasks;

- 4) At T1, the live group recalled more than the video and slides groups, with the exception of the video group in terms of action correct responses. The video group recalled more than the slides group, with the exception of descriptive correct responses;
- 5) Live and video subjects made more responses indicating that they were not misled on the misleading questions than was the case for the slides group;
- 6) On the facial recognition task, live subjects had more correct responses than video and slides subjects. Live subjects made fewer incorrect responses than their video and slides counterparts; and
- 7) The live group reported greater arousal than the video and slides groups upon seeing the crime scene, but the difference in arousal did not significantly affect the subjects' recall.

Discussion

The three hypotheses concerning increased arousal for the live group, hypnosis subjects being misled more on the misleading questions, and the hypnosis group making less correct and more incorrect responses to the facial recognition tasks were supported by the present study. The hypotheses concerning changes in recall from T1 to T2 were not supported. The hypotheses concerning responding at T1 were partially supported.

Hypnosis subjects did not improve their recall (or make more errors) on the cued recall questions from T1 to T2 compared to the relaxation control group. Thus, the present study failed to provide evidence that hypnosis per se leads to enhanced recall. It appears

likely that other factors, which are not always controlled, such as the subjects' expectations or motivation, may be the cause of hypnotic hypermnesia when it has been observed.

Yet, the issue is not so simple as hypnosis per se being inert. The present study, as well as the studies of Putnam (1979a), Sanders and Simmons (1983), and Zelig and Beidleman (1981) found that hypnosis impairs the testimony of subjects on misleading questions. Hypnotized subjects were misled more on the misleading questions--this was the case for the live and video groups, but not for the slides group. Perhaps with clearer images (live and video conditions), hypnosis subjects have artificially-inflated confidence, or do not use a normal degree of caution.

More disturbing in terms of the implications for forensic use, is the finding that the hypnosis group only made 66% as many correct, but 69% more incorrect identifications on the facial recognition tasks as compared to the relaxation group. That is, hypnosis makes subjects more likely to identify an innocent person as the perpetrator (and less likely to identify the actual offender). Perhaps the recognition format of the procedure (they simply choose one of the possible responses), or inflated confidence, leads to hypnosis subjects performing poorly. The results of the present study, and those of Sanders and Simmons (1983) and Wagstaff (1982), strongly suggest that hypnosis should not be used in helping witnesses of crime identify perpetrators.

The criterion shift theory (DePiano & Salzberg, 1981; Orne, 1979) holds that hypnosis may lead subjects to abandon normal caution in answering difficult questions. Subjects lower their

criterion level for reporting memories, and therefore provide information which is based on memories which are too weak to be reported under normal circumstances. This theory may explain the results in the present study concerning hypnosis subjects making more errors on the misleading questions and facial recognition tasks. Yet, hypnosis did not cause the subjects to make more errors at T2 on the cued recall questions, as would be predicted by the theory. It may be that the criterion shift theory, if it is valid, only applies to some types of questions (misleading questions and facial recognition tasks). Further investigation is necessary to clarify the reasons for this response pattern.

The findings of Shields and Knox (1986) could be used to argue that the reason for the lack of hypnotic hypermnesia in the present study, as well as in past studies, is that the information was processed at a "shallow" rather than a "deep" level. However, it should be noted that on their word-recall and word/recognition tasks, the researchers could easily manipulate the level of processing according to their conceptualizations. For example, for the word "dog", "deep" processing occurs when the subjects answer a question about the word such as "is this a four-footed animal? For the word "night", "shallow" processing occurs when the subject answers a question such as, "does this word rhyme with "right"? It is unlikely, however, that all the information concerning a crime which is processed by a witness conforms to one or both of these "levels" of processing. There may be various kinds and various levels of processing for various aspects of the crime scene. Perhaps for this reason, as well as others, Shields and Knox warn that

generalization of their results to the forensic context is unwarranted. Yet, their study does raise interesting questions concerning the manner in which knowledge of the crime is processed by witnesses, and whether this manner of processing influences hypnotic hypermnesia.

In terms of the impact of stimulus medium on recall, the present study found that the more realistic the enactment (the live condition considered to be the most realistic and the slides condition considered to be the least realistic), the better was the recall. Live subjects outperformed video and slides subjects on the cued recall questions at T1. In turn, video subjects outperformed slides subjects. Live and video subjects made more responses indicating that they were not misled on the misleading questions than was the case for the slides group. And finally, live subjects had more correct and less incorrect responses than their video and slides counterparts on the facial recognition task. The importance of the facial recognition task for the police investigation and court process argues for the use of a live enactment in forensic studies.

One could argue that subjects in the live condition were better able to see the stimuli than the other subjects, despite the fact that questions were deleted from the analysis which raters felt gave an advantage to one group over another. Another possible explanation of the results is that people are more familiar with learning and retrieval in the context of a "live" event, and therefore more accurate in their recall.

Future studies would be wise to utilize live enactments, and videotape them for scoring purposes. This would make the stimulus

material as forensically relevant as possible, and would eliminate possible criticism that the stimulus medium of a two dimensional videotape or slides presentation may affect the results. It should be noted, however, that the reality of the event, the element of surprise, and the consequences for the witness would still set a live enactment apart from an actual crime.

Despite Yuille and McEwan's (1985) statement that "it may require the complexity and full dimensionality of a live event for hypnosis to prove effective . . .", the present study indicated that even under this condition, hypnosis does not improve recall. In fact, hypnosis impaired recall on the misleading questions and the facial recognition tasks. Although Yuille and McEwan's prediction of the impact of stimulus medium on hypnotic hypermnesia was not supported, the present study indicated that the type of stimulus medium employed does influence recall.

Although the problem of generalizing from the laboratory to real life situations can never be overcome completely, the present study was an attempt to make the experimental situation as forensically valid as possible. Further improvements could be made in future studies. Subjects in the present study used two different modes of communication in answering the cued recall questions at T1 and T2 (that is, they filled out a questionnaire at T1, and spoke their answers into a microphone at T2). Future studies should control for the format in which the response is given.

In the present study, questions were devised in order to avoid bottoming and ceiling effects. Although this experimental factor must be kept in mind, in order to have ecological validity, the

difficulty of the questions should correspond to the situation in actual forensic settings. Yuille and Kim (1987) presented evidence that the recall of witnesses may be quite reliable. In their field study of witnesses of actual crimes, the accuracy rate was 82%.

It is possible that subjects may have experienced a deeper or less deep trance at the second questioning than at the screening, due to the size of the group in which testing occurred, due to it being their second experience with hypnosis, or for other reasons. Although the three-item HGSHS:A appears to be valid in terms of the subjects' self-report corresponding to raters' observations (see Appendix CC, and Bentler & Hilgard, 1963), it appears to have been insufficient to assess depth of trance due to the small number of items. A small experiment conducted at the close of the present study supports the suggestion that the depth of trance may not be consistent from one induction to another (see Appendix DD). Researchers should consider administering the entire HGSHS:A in conjunction with the interrogation to assess the depth of trance.

Further, it is possible that the 12 "test" items of the HGSHS:A may deepen hypnosis over the purely induction phase. If this is the case, it is possible that the present investigation and past studies which screened subjects on the HGSHS:A and then subsequently only used the induction, may have had subjects who were not as deeply hypnotized as in the screening session.

The live group reported greater arousal than the video and slides groups upon seeing the crime scene, but the difference in arousal did not significantly affect recall. Although the degree of arousal in the present study did not affect the results, it is possible that greater

arousal may be experienced in the forensic context and may influence recall. The present study used a 7-point scale to measure arousal. Future studies may wish to make more comprehensive assessment of the level of arousal. Further, future studies may be able to enhance arousal in an ethically acceptable manner by using lighting and sound to make the presentation of the crime scene much more dramatic. The researcher was surprised that subjects reported as much arousal as they did (the arousal ratings ranged from an average of 3.5 to 4.6 for the three groups) given his view that the crime scene was not as dramatic as most televised depictions of crime.

Research indicating that hypnosis impairs the memory of witnesses of crime, and court decisions in recent years excluding hypnotically-aided testimony, suggest that researchers should pursue non-hypnotic memory facilitation techniques (Pinizzotto, 1989). Some memory aids are fairly well established. Repeated testing has proven to lead to greater recall (Erdelyi & Kleinbard, 1978), even though this was not the case in the present study. There is some evidence to suggest that reinstating the context of the learning may improve memory (Godden & Baddeley, 1975). Norman (1976) demonstrated that visualizing the setting and attempting to capture the original emotional context may be sufficient to improve memory. These types of memory devices were used in the present study in both the hypnosis and relaxation control groups. Whether or not they would have facilitated recall over a true control condition is impossible to determine.

The results of the present study suggest that hypnosis should only be used as a last resort after all other memory facilitation techniques are employed, and provided only corroborated information is used (for example, a license plate number given under hypnosis may lead to a car being examined, but only physical evidence would be used in court). As Sanders and Simmons (1983) have stated: "There is no quarrel with this investigative technique as long as hypnotic testimony is regarded as essentially equivalent to anonymous tips" (p. 70).

Eventually, police forces may be forced by the courts to become more sophisticated concerning the manner in which they question witnesses, and in their use of memory facilitation techniques. As the present study, and those of Putnam (1979a), Sanders and Simmons (1983), and Zelig and Beidleman (1981) have indicated, police should be very careful not to inadvertently ask misleading questions of hypnotic subjects. Further, the courts should consider discriminating between information provided in free recall, which tends to be more accurate but less substantial (Hilgard & Loftus, 1979), and information given under cued recall or recognition conditions, which may be less reliable. This would encourage police officers to restrict their use of less reliable interrogation methods.

In addition to conducting more forensically-relevant studies, future research should also focus on intensive follow-up of subjects demonstrating hypnotic hypermnesia. For example, in the present study, six hypnosis subjects (as compared to one control subject) demonstrated an increased recall of two or more items on the cued-recall questionnaire from the first to the second questioning. Such

subjects could be studied under a variety of conditions to determine, among other things, whether their hypnotic hypermnesia is in fact a stable trait. Likewise, actual witnesses of crime who demonstrate hypnotic hypermnesia could be studied intensively. If initial results are not replicated in other conditions, further doubt would be cast on the hypnotic hypermnesia effect. If hypnosis truly enhances the memory of some people, the present practice of relying on group designs may be obscuring much important information, and thereby account for the discrepancy between case study reports and the results of scientific studies.

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Appendix A
Recruiting Instructions

Subjects were phoned:

Hello. Is ___ ___ there? This is David Jackson from the Department of Psychology at the University of Manitoba. I got your name from a list of introductory psychology students who have participated in at least one experiment to date. Is my information correct that you are in introductory psychology? How many experimental credits have you received to date? (if five or less, continue)

I and my colleagues are conducting a two-part study called "drama." If you agree to participate, you would see a short dramatic production and be asked questions concerning it. Your responses would be kept confidential. I'm afraid I can't tell you anymore about the experiment at this time, but I can tell you that the two sessions are held exactly one week apart, with the first session taking about 30 minutes, and the second taking about 50 minutes.

Are you willing to participate, provided you are free when we have slots available. (if "yes") One requirement of our subjects is that they have normal vision, whether or not it is corrected with glasses or contact lenses--that is, that whether or not they have glasses, that they can see as well as most people. Is this the case for you?

Appendix B

Pre-Crime Instructions (audiotaped)

You are about to see a performance by some actors, depicting a scene involving a teaching assistant and two students after an exam. There is violence in the drama, but not more than you can typically see in prime-time television. If you wish to discontinue participation, you may leave now. (pause)

Please do not leave your seat or talk during the performance. The performance is brief, and intended as a serious simulation of a crime. Yet even so, people sometimes respond to simulated enactments by giggling. It is expected that you may experience nervousness, due to not knowing what to expect. However, by not taking the enactment seriously, you could disrupt other participants and could reduce the validity of the results of the study.

It is clear that the best way to have people take the drama seriously is to not inform the viewers that the crime is a staged enactment. However, since there is some violence in the scene, it is felt that ethically, the experimenter is obligated to inform observers of this fact, so that they can decline the opportunity to participate if they find such things offensive or too stressful.

For the purposes of this study, you are asked to imagine that the incident is actually occurring, and that the people involved are not actors. The scene involves two students and a teaching assistant. If you were an actual witness of the event after an exam took place, you would obviously recognized the teaching assistant. Thus, in this enactment, the teaching assistant is the person sitting up against the table when the drama first begins.

(time - 1:45; The enactment was then presented)

Appendix C

Post-Crime Instructions (audiotaped)

You will now be handed a booklet. Rate the level of arousal you experienced upon witnessing the incident. Also, print your full name where indicated. Do not turn the page until told to do so.

(time - 0:15)

(The subjects were given 30 seconds to complete this task)

Appendix D*
Arousal Rating

Cued Recall Questionnaire

code number: _____

Please rate your highest level of emotional arousal (stress) during
the incident by circling one of the following numbers:

Not at all tense		Moderately tense			Very tense	
1	2	3	4	5	6	7

Please Print Your Full Name Clearly

Sex: M F

(your name will be detached from the questionnaire
before it is used by the researcher)

DO NOT TURN THIS PAGE

UNTIL TOLD TO DO SO

*This page appeared as the first page of the questionnaire with the
cued recall questions.

Appendix E

Contextual Instructions (audiotaped)

I would like you to pretend that the incident was an actual crime, and that you were a student near the back of the room, and that you were the only witness to the crime. Imagine that you actually witnessed a stabbing. Try to imagine the fear and terror you would experience after viewing the crime. You would have been very surprised upon seeing the incident, and may have found it difficult to believe and accept that what was occurring was actually occurring.

Once the perpetrators ran off, you may have checked to see if the person was still alive, or may have run directly out of the room to phone the 911 emergency number. If you are like most people, you would have been so upset by what you witnessed, that the operator may have had difficulty understanding what you were saying. Fortunately, they are trained to remain calm and to ask for the necessary information, such as the location and address of the incident, whether the perpetrators were still around, whether you were in danger, and other important information. The operator would then call an ambulance, and the police.

The police dispatcher would first send a few cars to the university, since technically, a crime is still in progress--that is, the perpetrators are in the process of escaping. A couple of cars with uniformed officers would arrive, and shortly thereafter a couple of police detectives would come to the scene. The police dispatcher would also call the campus police. They would seal off the area--not in an attempt to apprehend the perpetrators, but to keep other people from disturbing or destroying evidence which may

be helpful to the police. The campus police would ask for your name and address, and would instruct you to wait in a room next door. A police patrol car would likely arrive on the scene first, and an officer would check to see if the body has a pulse. Upon failing to find one, they would have the campus police lock one of the two entrances to the room, and one of the campus police officers would stand at the door to prevent unauthorized persons from entering the room. The officers would then use their two-way radio to contact the police dispatcher. They would inform the dispatcher that they have secured the room, have the only witness to the crime--that being you--and are about to look for the perpetrators. The officers would quickly question you to get a description of the perpetrators, and would leave in search of them.

Shortly thereafter, the ambulance and more police would arrive, and the ambulance attendants would check for a pulse on the body. Upon failing to find a pulse, they would stand back and wait for the officers to photograph and trace the outline of the body with chalk. The attendants would remove the body. Some of the police officers would join the search for the perpetrators, and a couple of officers would ask you to come back into the room in which the crime was committed and would question you. You would be asked many questions concerning what took place. If you are like most people, you would want to help the police piece together what happened, and would help them identify the perpetrators involved in the incident.

Many people find that being questioned by a police officer is intimidating. Police officers are usually quite large in size, and the fact that they have a revolver at their side can be sobering. Further, you could expect the police officer to be very serious, and perhaps

not spend time setting you at ease.

(time - 4:10)

Appendix F

Task-Motivating Instructions* (audiotaped)

Imagine that you are going to be questioned by a police officer. The importance of your answers to the officer's questions would be clear to you, since you are the only eyewitness to the crime. The officer questioning you would want you to try to recall as much as possible. Remember, your testimony alone may be responsible for apprehending the perpetrators.

The importance of your recall of the crime will lead you to having increased concentration and attention. Your memory will be better than it ever was before. You will be able to think much more clearly than usual and you will be able to remember more details than you usually do. You will be able to recall many details without tiring, and you will not be bothered by distractions.

(time - 0:55)

*Adapted and expanded from Salzberg and DePiano (1980)

Appendix G

Instructions to Begin the Questionnaire (audiotaped)

In a minute you will be asked to turn the page of your booklet. Please try as hard as you can to answer the questions. If you simply do not know the answer to a question, please respond by writing the phrase, "Don't Know." Turn the page, and begin to answer the questions now.

(time - 0:20)

(The subjects were given 12 minutes to work on the questionnaire before being given further instructions)

Appendix H
Cued Recall Questionnaire

code number: _____

Please rate your highest level of emotional arousal (stress) during
the incident by circling one of the following numbers:

Not at
all tense

Moderately
tense

Very
tense

1 2 3 4 5 6 7

Please Print Your Full Name Clearly

Sex: M F

(your name will be detached from the questionnaire
before it is used by the researcher)

DO NOT TURN THIS PAGE

UNTIL TOLD TO DO SO

code number: _____

-
- Please answer all of the questions. Write clearly.
 - Do not guess--this is not a test. If you simply have no idea as to the answer to a question, write "Don't Know" or "DK" in the space provided.
 - Please give as many details as you can.

The incident involved a teaching assistant, a male student, and a female student.

- 1) How tall do you think the male student is (bare-footed)?

- 2) How much do you think the male student weighs?

- 3) Describe what the male student was wearing on the top part of his body (including the colour).

- 4) What was the colour of the male student's pants?

- 5) Was the male student holding anything when he first approached the teaching assistant, and if so, what?

- 6) Describe the male student's footwear.

- 7) How tall do you think the female student is (bare-footed)?

- 8) How much do you think the female student weighs?

- 9) Describe what the female student was wearing on the top part of her body (including the colour).

10) Describe what the female student was wearing on the bottom part of her body (including the colour)?

11) Describe the female student's footwear.

*12) Was the female student holding anything when she first approached the teaching assistant, and if so, what?

*13) Did anything distinctive happen to the students' tests which could help the police identify them, and if so, what?

14) Describe the object that the male student handed to the teaching assistant (including the colour)?

15) Where did the male student get this object from?

-Please answer all of the questions. Write clearly.

-Do not guess--this is not a test. If you simply have no idea as to the answer to a question, write "Don't Know" or "DK" in the space provided.

-Please give as many details as you can.

The incident involved a teaching assistant, a male student, and a female student.

*16) Who first attacked whom?

*17) Where did the knife come from?

*18) Who slashed whom with the knife?

- *19) Where on the body was the person slashed?

- 20) What colour was the handle of the knife?

- 21) What was the total length of the knife (in inches)?

- 22) Who stabbed the teaching assistant?

- 23) How many times was the teaching assistant stabbed?

- 24) What happened to the knife after the stabbing?

- 25) What eventually happened to the object which the male student had handed to the teaching assistant?

- 26) Who strangled the teaching assistant?

- 27) What was used in strangling the teaching assistant?

- 28) In which pile of papers were the student's tests placed?

- *29) How far down the pile of papers were the student's tests placed?

- 30) Who placed the tests in the pile of papers?

*Deleted from the analysis

Questions 1-11, 14, 20, & 21 are descriptive questions.
Questions 15, 22-28, & 30 are action questions.

Appendix I

Instructions Given After the Questionnaire was Completed

It is important that you have answered all of the questions in the questionnaire. Please go through it one more time to ensure that all questions have been answered.

(The subjects were given an additional 3 minutes)

(The subjects were then thanked, reminded of the follow-up session, and asked not to discuss the experiment with anyone during the following week)

Appendix J

Instructions for Session #2

(read to participants)

This week you will be asked questions over the audio cassette, and will give your answers into the microphone.

Put the headset on now and adjust it so that it is comfortable. Place the microphone in front of your mouth.

If at any time you experience problems with the cassette player, please raise your hand and someone will help you. The red light should remain lit for the entire duration of the session. If at any time it goes out, please raise your hand.

The volume has been set and will likely be loud enough. If you have trouble hearing the tape, you will find the volume adjustment on the left side of the machine.

When it is time to answer the questions, please lean your body into the booth. When you speak into the microphone, speak clearly but not too loudly.

Begin now by pushing the green button down.

(audiotaped)

As with all experiments conducted in the psychology department, you are free to discontinue participation at any time. If you wish to do so, stand up and leave. You may wait in room 393 across the hall until the experiment is over, and receive your two experimental credits at that time. (pause)

Last week you answered questions concerning an enacted crime. This week you will again answer questions concerning it, but will hear the questions and give your answers on this audiotape. I will now explain the procedure. You will be asked a question, and will then have about 10 seconds to speak your answer into the microphone on the headset. If you do not know the answer, simply say that you do not know. Please do not guess.

Before each question is asked, you will hear one tone which sounds like this (one tone). After the question has been asked, you will hear the tone sound twice like this (two tones). The sound of the two tones will be your reminder to speak your answer into the microphone.

Once again, the sequence goes as follows. You will hear one tone, then a question, then two tones, and then you have about 10 seconds to give your response. Then you will hear one tone, and the next question will be asked, and so forth.

Try one practice question now. The question is: (one tone) "What is your full name?" (two tones) (pause)

If you stated your full name after hearing the two tones, you did so correctly. You will have a chance to try one more practice question a little later.

The questions will begin in a little while. First, however, I would like you simply to relax and listen to my voice.

(time - 2:10)

Appendix K

Pre-Hypnotic Instructions (audiotaped)

In a few minutes I am going to ask you some questions concerning the enacted crime you witnessed last week. First, however, a hypnotic induction will be played.

For the purposes of this experiment, it was necessary not to inform participants ahead of time that some of them would be hypnotized. A randomization procedure determined which participants would be hypnotized in this study. I am aware that you participated in a previous study called "Susceptibility", and you may recall that Dr. Thomas mentioned that participants would be contacted for further studies. This is one such study.

(time - 0:42)

Appendix L

Hypnosis Induction* (audiotaped)

I want you to seat yourself comfortably, and rest your hands on the table. That's right, rest your hands on the table. Now look at your hands, and find a spot on either hand, and just focus on it. It doesn't matter what spot you choose, just select some spot to focus on. I shall refer to the spot which you have chosen as the target. That's right, hands relaxed. Look directly at the target. I am about to give you some instructions that will help you relax and gradually to enter a state of hypnosis. Just relax and make yourself comfortable. I want you to look steadily at the target, and while keeping your eyes upon it, to listen to what I say. Your ability to be hypnotized depends partly on your willingness to cooperate, and partly on your ability to concentrate upon the target, and upon my words. With your cooperation, I can help you to become hypnotized. You can be hypnotized only if you are willing. I assume that you are willing, and that you are doing your best to cooperate by concentrating on the target, and listening to my words, letting happen whatever you feel is going to take place. Just let it happen. If you pay close attention to what I tell you, and think of the things I tell you to think about, you can easily experience what it is like to be hypnotized. There is nothing fearful or mysterious about hypnosis. It is a perfectly normal consequence of certain psychological principles. It is merely a state of strong interest in some particular thing. In a sense, you are hypnotized whenever you see a good show and forget you are part of the audience, but instead

feel you are part of the story. Many people report that becoming hypnotized feels at first like falling asleep, but with the difference that some how or other, they keep hearing my voice as a sort of background to whatever other experience they may have. In some ways, hypnosis is like sleep walking. However, hypnosis is also an individual experience, and is not just alike for everyone. In a sense, the hypnotized person is like a sleep walker, for he can carry out various and complex activities while remaining hypnotized. All I ask of you, is that you keep your attention and interest, and continue to cooperate as you have been cooperating. Nothing will be done that will cause you any embarrassment. Most people find that this is a very interesting experience.

Just relax. Don't be tense. Keep your eyes on the target. Look at it as steadily as you can. Should your eyes wander away from it, that will be alright. Just bring your eyes back to it. After a while you may find that the target gets blurry, or perhaps moves about, or again, changes colour. That is alright. Should you get sleepy, that will be fine. Whatever happens, let it happen, and keep starring at the target for a while. There will come a time, however, when your eyes will be so tired, will feel so heavy, that you will be unable to keep them open any longer, and they will close, perhaps quite involuntarily. When this happens, just let it take place.

As I continue to talk, you will find that you will become more and more drowsy, but not all people respond at the same rate to what I have to say. When the time comes that your eyes have closed,

just let them remain closed. You may find that I shall still give suggestions for your eyes to close. These suggestions will not bother you. Giving these suggestions will not disturb you, but will simply allow you to relax, more and more.

You will find that you can relax completely, but at the same time sit up comfortably in your chair with little effort. You will be able to shift your position to make yourself comfortable as needed, without it disturbing you. Now just allow yourself to relax completely. Relax every muscle of your body. Relax the muscles of your legs. Relax the muscles of your feet. Relax the muscles of your arms. Relax the muscles of your hands, of your fingers. Relax the muscles of your neck, of your chest. Relax all the muscles of your body. Let yourself be limp, limp, limp. Relax more and more, more and more. Relax completely. Relax completely. Relax completely.

As you relax more and more, a feeling of heaviness, perhaps, comes over your body. A feeling of heaviness is coming into your legs and your arms. Into your feet and your hands. Into your whole body. Your legs feel heavy and limp, heavy and limp. Your arms are heavy, heavy. Your whole body feels heavy, heavier, and heavier. Like lead. Your eyelids feel especially heavy. Heavy and tired. You're beginning to feel drowsy, drowsy and sleepy. Your breathing is becoming slow and regular, slow and regular. You are getting drowsy and sleepy, more and more drowsy and sleepy while your eyelids become heavier and heavier, more and more tired and heavy.

Your eyes are tired from staring. The heaviness in your eyelids is increasing. Soon you will not be able to keep your eyes open. Soon

your eyes will close of themselves. Your eyelids will be too heavy to keep open. Your eyes are tired from staring. Your eyes are becoming wet from straining. You are becoming increasingly drowsy and sleepy. The strain in your eyes is getting greater and greater, greater and greater. It would be so nice to close your eyes, to relax completely, and just listen sleepily to my voice talking to you. You would like to close your eyes and relax completely, relax completely. You will soon reach your limit. The strain will be so great, your eyes will be so tired, your lids will become so heavy, your eyes will close of themselves, close of themselves.

Your eyelids are getting heavy, very heavy. You are relaxed, very relaxed. There is a pleasant feeling of warmth and heaviness all through your body. You are tired and drowsy. Tired and sleepy. Sleepy. Sleepy. Sleepy. Listen only to my voice. Pay attention to nothing else but my voice. Your eyes are getting blurred. You are having difficulty seeing. Your eyes are strained. The strain is getting greater and greater, greater and greater.

Your lids are heavy. Heavy as lead. Getting heavier and heavier, heavier and heavier. They are pushing down, down, down. Your eyelids seem weighted, weighted with lead, heavy as lead . . . Your eyes are blinking, blinking, blinking . . . closing . . . closing . . .

Your eyes may have closed by now, and if they have not, they would soon close of themselves. But there is no need to strain them more. Even if your eyes have not closed fully as yet, you have concentrated well upon the target, and have become relaxed and

drowsy. At this time you may just let your eyes close. That's it, eyes completely closed. Close your eyes now.

You are now comfortably relaxed, but you are going to relax even more, much more. Your eyes are now closed. You will keep your eyes closed until I tell you otherwise, or I tell you to awaken You feel drowsy and sleepy. Just keep listening to my voice. Pay close attention to it. Keep your thoughts on what I am saying. Just listen. You are going to get much more drowsy and sleepy. Soon you will be deep asleep, but you will continue to hear me. You will not awaken until I tell you to do so. I shall now begin to count. At each count you will feel yourself going down, down, into a deep, comfortable, a deep restful sleep. A sleep in which you will be able to answer the questions which I ask. One--you are going to go deeply asleep . . . Two--down, down into a deep, sound sleep . . . Three--four--more and more, more and more asleep . . . Five--six--seven--you are sinking, sinking into a deep, deep sleep. Nothing will disturb you. Pay attention only to my voice. I would like you to keep on paying attention to my voice and the things I tell you . . . Eight--nine--ten--eleven--twelve--deeper and deeper, always deeper sleep--thirteen--fourteen--fifteen--although deep asleep you can clearly hear me. You will always hear me no matter how deeply asleep you may feel yourself to be . . . Sixteen--seventeen--eighteen--deep asleep, fast asleep. Nothing will disturb you. You will be able to speak your answers to my questions into the microphone. Nineteen, twenty.

Deep asleep! You will not awaken until I tell you to do so. You will wish to sleep and will give the answers to the questions I shall ask.

As you become even more drowsy and sleepy, it will not disturb you to make yourself comfortable in your chair and to put your head in a comfortable position.

(time - 14:52)

*Modified version of the Harvard Group Scale of Hypnotic Susceptibility: Form A (Shor & Orne, 1962)

Appendix M

Pre-Relaxation Instructions (audiotaped)

In a few minutes I am going to ask you some questions concerning the enacted crime you witnessed last week. First, however, I would like you to participate in a relaxation exercise.

Often when the police first question witnesses of crime, the witnesses are very tense. This is understandable since they just witnessed a crime. However, sometimes it is desirable to have the witness feeling very relaxed as they recall what they saw.

(time - 0:32)

Appendix N

Relaxation Exercise (audiotaped)

I want you to seat yourself comfortably and rest your hands in your lap. Many people believe that becoming relaxed involves becoming drowsy. This simply is not true. Some people are able to relax by watching a movie, playing a sport, or exercising. Obviously, one does not want to get drowsy in any of these situations. Likewise, it is best if you are fully alert when you answer the questions which will follow shortly.

Keep your eyes open throughout the relaxation exercise. Do not look around at the other people, but do not close your eyes until I tell you to do so.

If at any time you wish to shift your position in your chair to make yourself more comfortable, by all means do so. If you notice that the way in which you are sitting, or the way in which you have your arms or legs is causing tension in your muscles, just shift your body to a more comfortable position.

The first aspect of becoming relaxed involves getting your mind off things which make you feel uptight. Take a minute to think of any of the stressful things which may have been on your mind today. Let these thoughts flow into your head if they are of concern to you. Take a moment now. (Pause)

Now put any stressful thoughts aside. If you become aware of any stressful thoughts, just let them enter your head, and then pass on and out of your head. Don't struggle to keep stressful thoughts out of your awareness, for this struggle will simply make you more

tense. Let any thoughts that may, drift into your awareness, and then simply drift out. Allow yourself to take the next little while and only think about the things which I will suggest to you. There will always be time later for stressful thoughts. Just let yourself take this time to listen to my voice and do the things I will suggest to you.

First, take a couple of fairly deep breaths. Breath in a little deeper, hold the breath a little longer, and then expel all of the air. Take a couple of fairly deep breaths. That's fine. As you breath in, many of the muscles of your body will tense, but let them relax as your breath out. Just breath normally now.

Sometimes simply taking a few deep breaths can help people become more relaxed. However, you should not take too many or you may become a little dizzy. Now just let yourself breath at a depth which is comfortable for you. From time to time over the next few minutes I will remind you to pay attention to your breathing and to breath a little deeper, if you wish to. Most people breath in a shallow fashion when they are anxious, and a little deeper and slower when they are relaxed. It is often helpful to tune in, from time to time, to your breathing. If you are restricting your breathing, you can then simply breath a little deeper and relax a little more.

Now I'm going to ask you to pay attention to various muscle groups in your body. The state of our muscles is important to relaxation for a couple of reasons. If you are experiencing pain or uncomfortableness in any muscle, this may interfere with your state of relaxation even though you may not always be aware of the

sensations. Further, many people respond to stress by tightening up some of their muscles. Some people experience tight muscles in their neck and shoulders, whereas others may get tight muscles in their back or other areas of the body.

If, however, you have injured a muscle group, or have problems with certain muscles, you may wish to skip this muscle group, or not to tense this group of muscles as tightly as you might otherwise do. Use your common sense not to hurt yourself.

I'm going to have you tense and relax certain muscle groups. When you tense them, only tense them to about 75% of their potential. The purpose is not for the muscles to ache, but for you to focus on the sensations of tension in your muscles.

Put your forearms and hands on the table top. In a minute I'm going to ask you to make a fist and hold it tight for a few seconds. As you do this, pay attention to the feelings of strain and tightness in the muscles of your hands. Then I will ask you to stop tensing your hands and let them relax. At that time focus on the new sensations in your hands. The point of this exercise is to notice the vast difference in the sensations in your hands when they are relaxed versus when they are tense, and to use this awareness to further relax your muscles.

Let's start now. Hands and forearms on the table top. Make a fist and hold the tension now. Hold it. Feel the tension and release it now. Relax the hands and notice the sensations in your hands. You may feel a warm sensation from the blood flow, or you may feel a tingling sensation. Just let the muscles now relax. Ironically,

tensing and then relaxing muscles can lead to the muscles feeling more relaxed than they otherwise would.

Try it again. Tense the muscles now. Hold your fist tightly and concentrate on the straining muscles. Hold it and now let them relax. Notice the difference in sensations and let the muscles relax as much as possible.

Now focus on your breathing once again. Take a few deeper breaths. Let the breaths relax your muscles of your torso. Breathing in tenses the muscles of your chest, but breathing out allows them to relax. And now let your breathing return to normal. Just breathe now as feels most comfortable.

Now let's do this exercise with the wrists and forearms. In a minute I will ask you to extend your arms straight out in front of you on the table top with your palms facing down. Then bend your hands so that your fingernails come closer to your face and feel the tension in your wrists and forearms. Try it now. Extend your arms and bend your hands back toward your face, feel the tension, and relax the muscles now. Feel the strain of the muscles lessen and feel the muscles relax. Let the muscles smooth out and go flaccid. Do this exercise one more time. Pull your hands back toward your face now. Focus on the straining muscles. Hold it for a minute and let your muscles relax now. Feel the sensations as the muscles relax more and more and the feelings of tension lessen.

Let the muscles of your hands, wrists, forearms, and upper arms relax. Shake them or stretch them a little to help the muscles relax. Let any remaining tension dissipate. If at any time you become

aware of tension creeping back into your hands or arms, focus on them for a minute and let them relax completely.

Now focus on your breathing once again. Take a few deeper breaths. Let the breaths relax your muscles of your torso. Breath in and out as you let the muscles of your torso relax more and more. And now let your breathing return to normal. Just breath now as feels most comfortable.

The next exercise involves tensing the muscles of the feet. In a moment I'll ask you to scrunch your toes up as much as possible in your shoes. Remember though, only tense the muscles to about 75% of their potential. Do it now. Scrunch your toes up and feel the muscles of your feet straining. Feel the tension, and relax them now. Notice the difference in sensations between tension and relaxation. Feel the blood circulating and the muscles relaxing. Let the muscles relax completely in your shoes, and let your feet feel lazy and limp. Let's try it one more time. Scrunch your toes up now. Hold them and feel your muscles work and strain. And relax them now. Relax the muscles of your feet completely and let the muscles feel tired, calm and relaxed. Wiggle your toes just a little to allow your feet to relax more and more. That's it. Let the muscles expel all sensation of tension. Let them relax.

Now focus on your breathing once again. Take a few deeper breaths. Let the breaths relax the muscles of your torso. And now let your breathing return to normal. Just breath now as feels most comfortable.

The next exercise involves bending your feet up toward your shins. Sit comfortably in your chair and in a few seconds I'll ask you

to bend your feet up toward your shins and experience the tension in your calves. Try it now. Bend your feet up toward your shins and feel the strain of your calves. Hold it for a few seconds and relax them now. Feel the sensations and relax the muscles more and more. Notice the difference between tension and relaxation, and feel the sensations you may be experiencing in your calves. Try it one more time starting now. Notice the tightness of the muscles, feel them flexing, hold it now, and relax the muscles now. Let the muscles smooth out and again wiggle your feet just a little to help the muscles relax.

Stretch the arms and hands a little to let any tension which may have crept in disappear. Do the same to your legs. Now leave your arms where they are but rotate your shoulders a little to loosen up the muscles of your upper back and neck. And finally, take a few more deep breaths starting now. Let your breathing relax you.

Okay. Let's do one last muscle group. This time we will do the thighs. All you have to do to experience tension in the thighs is just to leave them as they are and intentionally tense the muscles. Again, only tense them to about 75% of their potential, but hold the tension for a few seconds. Ready, flex your thighs now. Keep the muscles tight. Hold them, and relax them now. Notice the sensations as your thighs relax and let the muscles relax completely. Let's try it one last time. Tense your thighs now. Keep them tense. Keep them tight and relax them now. Let the muscles of your thighs smooth out and relax, and let any remaining tension in your legs disappear. Just let your chair hold your body up and let all of the muscles relax more and more.

One last time, take a few deeper breaths. As you do let your breathing relax all the muscles of your body. As you breath out, let any remaining tension dissipate completely.

In a few minutes I am going to ask you some questions. First however, I would like you to close your eyes and keep them closed until you are told to open them. Close your eyes now, and keep them closed until you are told to open them.

(time - 15:02)

Appendix O

Pre-Questioning Instructions (audiotaped)

You will recall that the incident you witnessed last week involved a teaching assistant, a male student, and a female student. Please respond verbally to all of the questions I will ask. If you simply have no idea as to the answer to a question, speak the phrase, "Don't Know", into the microphone. Please give as many details as you can within the 10 seconds you are given to respond. Lean your body into the booth and I will give you the practice question again. (one tone) "What is your name?" (two tones) (pause) If you stated your name after hearing the two tones, you have done this correctly.

(time - 0:57)

(Task-Motivating Instructions--Appendix E--are then repeated)

Appendix P

Time Regression Instructions (audiotaped)

I want you to let your mind and thoughts go back in time over the course of the last week. Just let your thoughts go back to yesterday, the day before, and so on, until you go back exactly one week. Back in time to the scene of the crime you saw last week. Remember entering the room in which the crime occurred, and then sitting down. Remember being told that you were about to witness an event. Now I want you to remember the crime very clearly. Remember the crime and all that occurred.

Now I am going to ask you some questions about that crime.

(time - 0:45)

(The Cued Recall Questions--Appendix H--were then presented on the audiotape)

(time - 9:52)

Appendix Q

Cued Recall Misleading Questions (audiotaped)

- 1) Describe the teaching assistant's glasses.
- * 2) What was the principle colour in the teaching assistant's tie?
- 3) What was the colour of the female student's purse?
- 4) Describe the female student's necklace.
- 5) What was written on the blackboard behind the teaching assistant?
- 6) Whose hair did the teaching assistant pull?
- 7) What part of the teaching assistant's body was kicked?

(time - 2:25)

*Deleted from the analysis.

Appendix R

Facial Recognition Instructions (audiotaped)

In a minute I am going to ask you to open your eyes, to open the folder in front of you, and to look at the 16 photographs in the folder. Eight of the pictures are of men and eight are of women. I will ask you whether you see the male student among the pictures. Then I will ask you whether you see the female student among the eight pictures of the women. When I ask for your response, you can respond in one of three ways: by stating the number of the picture; by stating that a picture of the perpetrator is not present; or by stating that you "Don't Know".

Alright. Open your eyes now. Wide open. Open your eyes. Now open the folder. Look at the eight photographs of the men. Look very carefully at the eight photographs of the men. In a minute I will ask you to give one of three responses: the number of the photograph corresponding to the perpetrator; or you can say that the picture of the male perpetrator is not present; or you can respond by saying that you "Don't Know". Take one last look at each face. Look closely at each picture of the men. (pause) I will now ask the question. (one tone) "Is the male perpetrator's picture there, and if so, what is the number?" (two tones) (10 second pause)

Now look at the eight photographs of the women. Look very carefully at the eight photographs of the women. In a minute I will ask you to give one of three responses: the number of the photograph corresponding to the perpetrator; or you can say that the picture of the female perpetrator is not present; or you can respond by saying that you "Don't Know". Take one last look at each face. Look closely

at each picture of the women. I will now ask the question. (one tone) "Is the female perpetrator's picture there, and if so, what is the number?" (two tones)

Now close your eyes once again. That's it. Tightly shut. Now I'm going to give you a few suggestions. Just relax and listen to my voice.

(time - 3:15)

Appendix S
Facial Recognition Tasks*

MALES



FEMALES



*The perpetrators were numbers 8 and 14.

Appendix T

Three-Item HGSHS:A (audiotaped)

Put your fingers together. Interlock your fingers together. Interlock your fingers and press your hands tightly together. That's it. Put your fingers together. Interlock your fingers and press your hands tightly together. Interlocked tightly . . . hands pressed tightly together. Notice how your fingers are becoming tightly interlocked together, more and more tightly interlocked together . . . so tightly interlocked together, that you wonder very much if you could take your fingers and hands apart. Your fingers are interlocked, tightly interlocked . . . and I want you to try to take your hands apart. Just try. (10 second pause)

That's right. Stop trying and relax. You notice how hard it was to get started to take them apart. Your hands are no longer tightly clasped together. You can take them apart. Now return your hands to their resting position and relax. Hands to their resting position and relax. Just relax.

You are very relaxed now . . . deeply relaxed. Think how hard it might be to communicate while so deeply relaxed . . . perhaps as hard as when asleep. I wonder if you could shake your head to indicate "no." I really don't think you could. You might try a little later to shake your head "no" when I tell you to, but I think you will find it quite difficult. Why don't you try to shake your head "no" now. Just try. (10 second pause)

That's alright. Stop trying and relax. You see again how you have to make an effort to do something normally as easy as shaking

your head. You can shake it to indicate "no" much more easily now. Shake your head easily now. That's right, now relax. Just relax.

You have had your eyes closed for a long time while you have remained relaxed. They are by now tightly closed, tightly shut. In a few moments I shall ask you to try to open your eyes. When you are told to try, most likely your eyes will feel as if they were glued together . . . tightly glued shut. Even if you were able to open your eyes, you would, of course, only do so momentarily and then immediately close them again and relax, so as not to disturb your concentration. But I doubt that you will be able--even momentarily--to open your eyes. They are so tightly closed that you could not open them. Perhaps you would soon like to try to open your eyes momentarily in spite of their feeling so heavy and so completely . . . so tightly closed. Just try. Try to open your eyes. (10 second pause)

Alright. Stop trying. Now again allow your eyes to become tightly shut. Your eyes, tightly shut. You've had a chance to feel your eyes tightly shut. Now relax. Your eyes are normal again, but just keep them closed and relaxed. Normal again . . . just keep them closed and relaxed . . . relaxed and shut.

(time - 4:53)

Appendix U

Instructions to Conclude the Hypnosis (audiotaped)

Remain deeply relaxed and pay close attention to what I am going to tell you next. In a moment I shall begin counting backwards from 20 to 1. You will gradually wake up, but for most of the count you will still remain in the state you are now in. By the time I reach "5" you will open your eyes, but you will not be fully aroused. When I get to "1" you will be fully alert, in your normal state of wakefulness. You will have no headache or other after-effects. I shall now count backwards from 20, and at "5," not sooner, you will open your eyes but not be fully aroused until I say "1". At "1" you will be awake. Ready, now: 20--19--18--17--16--15--14--13--12--11--10. Half way--9--8--7--6--5--4--3--2--1. Wake up! Wide awake! Any remaining drowsiness which you may feel will quickly pass.

(time - 1:55)

*From the Harvard Group Scale of Hypnotic Susceptibility: Form A
(Shor & Orne, 1962)

Appendix V

Instructions to Conclude the Relaxation Exercise (audiotaped)

Pay close attention to what I am going to tell you next. In a moment I shall begin counting backwards from 20 to 1. Use the counting to become more alert and less relaxed. Leave your eyes closed until I reach "5", but open them once I do so. When I reach "1" stretch a little or shift a little in your chair to become more alert and oriented again. Most people find that doing a relaxation exercise such as the one you participated in earlier, leaves them feeling better than otherwise. Some people report that relaxation exercises help to relieve minor headaches and minor aches and pains. Now: 20--19--18--17--16--15--14--13--12--11--10. Half-way--9--8--7--6--5--4--3--2--1. Stretch a little. Any excessive feelings of relaxation will quickly pass.

(time - 1:52)

Appendix W

Conclusion (audiotaped)

In a minute you will be given one very short questionnaire to complete. When I tell you, push the black button on the cassette machine and place the headphones on the hook. Push the black button now.

(time - 0:13)

(The subjects were given the Post-Experiment Questionnaire)

Appendix X

Post-Experiment Questionnaire (Hypnosis Subjects)

- 1) Did you suspect that you, or other participants in the study would be hypnotized prior to hearing about the hypnotic induction on the audiotape? _____
If "yes", explain: _____
- 2) Do you think you were hypnotized prior to the questioning?

- 3) Do you think you were hypnotized during the questioning?

- 4) Did you discuss the experiment with anyone in the last week?

If "yes", did you discuss the details of the crime scene with anyone who participated in the study? _____
If so, explain: _____
- 5) Have you taken any criminology courses? _____
- 6) Do you believe hypnosis leads to improved recall? _____
- 7) Have you used this language laboratory before (the room you are in), or a similar one? _____
- 8) You were told to interlock your fingers, told how your fingers would become tightly interlocked, and then told to try to take your hands apart. Would you estimate that an onlooker would have observed that your fingers were incompletely separated (before you were told to stop trying to take them apart)?

Circle one: A. My fingers were still incompletely separated by then.
B. My fingers had completely separated by then.

9) You were next told to think how hard it might be to shake your head to indicate "no", and then told to try. Would you estimate that an onlooker would have observed you to make a recognizable shake of the head "no"? (That is, before you were told to stop trying).

Circle one: A. I did not recognizably shake my head "no".
B. I did recognizable shake my head "no".

10) You were next told that your eyelids were so tightly closed that you could not open them, and then you were told to try to do so. Would you estimate that an onlooker would have observed that your eyes remained closed (before you were told to stop trying)?

Circle one: A. My eyes remained closed.
B. My eyes had opened.

PLEASE DO NOT DISCUSS THIS EXPERIMENT WITH ANYONE.

If you would like to be mailed a summary of the results of the study in about one month, provide your name and address below.

Name: _____

Address: _____

Postal Code: _____

Whether or not you wish to be mailed a summary of the study, print your name below. Your name will be detached from the questionnaire before the researcher examines the responses. When you are finished, leave the entire booklet on the table top.

Name: _____

Code Number: _____

Appendix Y

Post-Experiment Questionnaire (Relaxation Subjects)

- 1) Did you suspect that you, or other participants in the study would be hypnotized? _____
If "yes", explain: _____
- 2) Do you think you were hypnotized prior to the questioning?

- 3) Do you think you were hypnotized during the questioning?

- 4) Did you discuss the experiment with anyone in the last week?

If "yes", did you discuss the details of the crime scene with anyone who participated in the study? _____
If so, explain: _____
- 5) Have you taken any criminology courses? _____
- 6) Do you believe hypnosis leads to improved recall? _____
- 7) Have you used this language laboratory before (the room you are in), or a similar one? _____
- 8) You were told to interlock your fingers, told how your fingers would become tightly interlocked, and then told to try to take your hands apart. Would you estimate that an onlooker would have observed that your fingers were incompletely separated (before you were told to stop trying to take them apart)?

Circle one: A. My fingers were still incompletely separated by then.
B. My fingers had completely separated by then.

9) You were next told to think how hard it might be to shake your head to indicate "no", and then told to try. Would you estimate that an onlooker would have observed you to make a recognizable shake of the head "no"? (That is, before you were told to stop trying).

Circle one: A. I did not recognizably shake my head "no".
B. I did recognizable shake my head "no".

10) You were next told that your eyelids were so tightly closed that you could not open them, and then you were told to try to do so. Would you estimate that an onlooker would have observed that your eyes remained closed (before you were told to stop trying)?

Circle one: A. My eyes remained closed.
B. My eyes had opened.

PLEASE DO NOT DISCUSS THIS EXPERIMENT WITH ANYONE.

If you would like to be mailed a summary of the results of the study in about one month, provide your name and address below.

Name: _____

Address: _____

Postal Code: _____

Whether or not you wish to be mailed a summary of the study, print your name below. Your name will be detached from the questionnaire before the researcher examines the responses. When you are finished, leave the entire booklet on the table top.

Name: _____

Code Number: _____

Appendix Z

Debriefing

PLEASE READ THIS AFTER COMPLETING THE POST-EXPERIMENT QUESTIONNAIRE

This study involved comparing hypnosis to a regular "awake" questioning concerning details associated with an enacted crime. Whereas all of the subjects were questioned in the "awake" state immediately following seeing the enacted crime (last week), this week half of the subjects were hypnotized via audiotape before being questioned. The other half of the subjects listened to and participated in a relaxation exercise. Concerning who would be hypnotized, this was randomly determined.

All of the subjects participating in the experiment were subjects in a previous experiment called "Susceptibility." Subjects were chosen for this experiment on the basis of their hypnotizability scores, using a range of various levels of hypnotizability.

The reason you were not told that your participation in the present study was related to your prior participation in the study called "Susceptibility", and that the present experiment would involve hypnosis for half of the subjects, is that we wanted to make the experiment as similar as possible to an actual police investigation. Witnesses of crime do not suspect that they may later be hypnotized when they are first questioned by police.

I hope you have enjoyed participating in this experiment, and now have a sense of what it might be like witness a serious crime and be questioned concerning your memory for that crime.

Once again, I would like to ask you not to discuss the study with anyone until the rest of the subjects have been run next week. Thank you.

You may now go and receive two experimental credits for your participation. Leave everything on your desk top, and go across the hall to room 393. The assistants will stamp your card and have you sign an attendance sheet.

Appendix AA

Table 1

Details of the Major Statistical Tests

Dependent Variable	Statistical Test	Source	DF	Type III SS	Mean Square	F Value	Pr > F
1. Arousal Level	One-way ANOVA	Stimulus Medium	2	23.876	11.938	7.48	0.0010
2. T1 Total Correct	One-way MANCOVA	Stimulus Medium	2	186.063	93.031	16.43	0.0001
		Arousal Covariate	1	1.986	1.986	0.35	0.5551
T1 Total Incorrect	One-way MANCOVA	Stimulus Medium	2	4.504	2.252	0.39	0.6804
		Arousal Covariate	1	0.570	0.570	0.10	0.7550
3. T1 Action Correct	One-way MANCOVA	Stimulus Medium	2	51.424	25.712	13.08	0.0001
		Arousal Covariate	1	0.365	0.365	0.19	0.6675
T1 Descrip Correct	One-way MANCOVA	Stimulus Medium	2	56.840	28.420	11.38	0.0001
		Arousal Covariate	1	0.673	0.673	0.27	0.6049
T1 Action Incorrect	One-way MANCOVA	Stimulus Medium	2	0.046	0.023	0.01	0.9877
		Arousal Covariate	1	0.490	0.490	0.26	0.6092
T1 Descrip Incorrect	One-way MANCOVA	Stimulus Medium	2	5.491	2.746	1.00	0.3700
		Arousal Covariate	1	1.650	1.650	0.60	0.4391

Table 1 (continued)

Dependent Variable	Statistical Test	Source	DF	Type III SS	Mean Square	F Value	Pr > F
4. Total Correct T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	3.688	3.688	2.99	0.0869
		Time x Stim Med	2	1.365	0.682	0.55	0.5765
		Time x Hyp/Relax	1	3.135	3.135	2.54	0.1140
		Time x Stim Med x Hyp/Relax	2	4.631	2.315	1.88	0.1584
		Time x Arousal	1	3.282	3.282	2.66	0.1060
Total Incorrect T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	11.651	11.651	4.74	0.0319
		Time x Stim Med	2	1.068	0.534	0.22	0.8051
		Time x Hyp/Relax	1	1.651	1.651	0.67	0.4144
		Time x Stim Med x Hyp/Relax	2	3.265	1.632	0.66	0.5170
		Time x Arousal	1	9.344	9.344	3.80	0.0541

Table 1 (continued)

Dependent Variable	Statistical Test	Source	DF	Type III SS	Mean Square	F Value	Pr > F
5. Action Correct T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	1.082	1.082	2.17	0.1441
		Time x Stimulus	2	0.202	0.101	0.20	0.8169
		Time x Hyp/Relax	1	1.642	1.642	3.29	0.0728
		Time x Stim Med x Hyp/Relax	2	3.023	1.512	3.03	0.0530
		Time x Arousal	1	0.786	0.786	1.58	0.2124
Descrip Correct T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	2.454	2.454	2.98	0.0874
		Time x Stimulus	2	0.509	0.255	0.31	0.7344
		Time x Hyp/Relax	1	0.075	0.075	0.09	0.7629
		Time x Stim Med x Hyp/Relax	2	0.356	0.178	0.22	0.8058
		Time x Arousal	1	2.267	2.267	2.76	0.1002
Action Incorrect T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	0.774	0.774	1.20	0.2769
		Time x Stimulus	2	1.952	0.976	1.51	0.2264
		Time x Hyp/Relax	1	0.278	0.278	0.43	0.5136
		Time x Stim Med x Hyp/Relax	2	0.300	0.150	0.23	0.7933
		Time x Arousal	1	0.876	0.876	1.35	0.2474

Table 1 (continued)

Dependent Variable	Statistical Test	Source	DF	Type III SS	Mean Square	F Value	Pr > F
Descrip Incorrect T1-T2	Two-way Repeated Measures ANCOVAs	Time	1	2.871	2.871	2.41	0.1241
		Time x Stimulus	2	0.110	0.055	0.05	0.9548
		Time x Hyp/Relax	1	2.900	2.900	2.43	0.1222
		Time x Stim Med x Hyp/Relax	2	2.032	1.016	0.85	0.4299
		Time x Arousal	1	2.046	2.046	1.72	0.1934
6. Misled	Two-way MANCOVA	Stimulus Medium	2	1.614	0.807	0.49	0.6151
		Hyp/Relax	1	10.210	10.210	6.18	0.0147
		Stim Med x Hyp/Relax	2	14.014	7.007	4.24	0.0172
		Arousal Covariate	1	2.840	2.840	1.72	0.1931
Not Mislead	Two-way MANCOVA	Stimulus Medium	2	7.409	3.705	3.10	0.0497
		Hyp/Relax	1	2.612	2.612	2.19	0.1426
		Stim Med x Hyp/Relax	2	8.966	4.483	3.75	0.0271
		Arousal Covariate	1	1.299	1.299	1.09	0.2997

Table 1 (continued)

Dependent Variable	Statistical Test	Source	DF	Type III SS	Mean Square	F Value	Pr > F
7. Facial Recognition Correct	Two-way MANCOVA	Stimulus Medium	2	8.935	4.468	12.57	0.0001
		Hyp/Relax	1	1.874	1.874	5.28	0.0239
		Stim Med x Hyp/Relax	2	0.104	0.052	0.15	0.8644
		Arousal Covariate	1	0.118	0.118	0.33	0.5659
Facial Recognition Incorrect	Two-way MANCOVA	Stimulus Medium	2	7.243	3.622	8.39	0.0004
		Hyp/Relax	1	3.936	3.936	9.12	0.0033
		Stim Med x Hyp/Relax	2	0.035	0.017	0.04	0.9604
		Arousal Covariate	1	0.024	0.024	0.06	0.8131

Appendix BB

Results of the Post-Experiment Questionnaire

1. Did you suspect that you, or other participants in the study would be hypnotized (prior to hearing about the hypnotic induction on the audiotape)?

Eighty-three subjects said "no", and 16 reported "yes" (1 said "wondered" and 1 reported "maybe"). The frequency of those saying "yes" ranged from a high of 5 in the live and slides relaxation groups, to a low of 0 in the slides/hypnosis group.

2. Reported in the text of the paper.

3. Reported in the text of the paper.

- 4a. Did you discuss the experiment with anyone in the last week?

Twenty subjects answered in the affirmative (9 hypnosis subjects and 11 relaxation subjects). The frequencies for the six cells ranged from 2 to 5.

- 4b. If so, did you discuss the details of the crime scene with anyone who participated in the study?

Two of the 20 subjects answered in the affirmative. One was from the video relaxation group, and the other was from the slides relaxation group.

5. Have you taken any criminology courses?

All the subjects responded "no."

6. Do you believe hypnosis leads to improved recall?

<u>Group</u>	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
Live Hypnosis	10	7	1
Live Relaxation	7	6	3
Video Hypnosis	6	4	7
Video Relaxation	15	2	2
Slides Hypnosis	11	3	2
Slides Relaxation	11	3	1

7. Have you used this language laboratory before, or a similar one?

<u>Group</u>	<u>Yes</u>	<u>No</u>
Live Hypnosis	2	16
Live Relaxation	4	12
Video Hypnosis	2	15
Video Relaxation	1	18
Slides Hypnosis	4	12
Slides Relaxation	4	11

Appendix CC

Validity of the Self-Rating System on the Three-Item HGSHS:A

A study was conducted to see whether the rating on the three-item test of hypnosis employed in this study corresponded to the rating an observer would make. Nineteen subjects were hypnotized using the audiotaped induction and tests of hypnosis employed during the second interrogation in the study. The subjects were hypnotized individually, and were videotaped. A rater, blind to the subjects' ratings of their responses, also rated their responses. Of 57 responses, 11 could not be scored due to technical problems with the video equipment and lighting. There was agreement between the subjects and the rater on 43 of the 46 responses which were scoreable (93.5%). Of the 46 responses, 38 were responses indicating that the person was behaving as though hypnotized. The three disagreements between subjects and rater concerned the item suggesting that the subject would not be able to shake his/her head.

Appendix DD

Re-Testing on the HGSHS:A

A small study was conducted to determine whether hypnotizability scores would be different in a small group setting as opposed to a large group of approximately 100 subjects, as was the case in the screening for the present study. Six subjects who participated in the study agreed at the completion of the study to be hypnotized again. The six subjects were hypnotized in a single group using the same audiotaped version of the HGSHS:A which was employed during the screening. Two subjects received the same hypnotizability score as at the screen (7 and 7; 8 and 8), two subjects received a higher score (7 and 10; 9 and 10), and the final two subjects received a lower score (7 and 5; 7 and 3).