NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

PSEUDOMEMORY, HYPNOSIS AND REPORTING BIAS

by

EVELYN M. BURES, B.Sc.

A thesis submitted to

the Faculty of Graduate Studies and Research

in partial fulfilment of

the requirements for the degree of

Master of Arts

Department of Psychology

Carleton University

Ottawa, Ontario

April 21, 1993

ISBN 0-315-84030-7

Canada

Name EVELYN KURES

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

Experimental Psychology
SUBJECT TERM

0623
SUBJECT CODE

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

COMMUNICATIONS AND THE ARTS

Architecture	0729
Art History	0377
Cinema	0900
Dance	0378
Fine Arts	0357
Information Science	0723
Journalism	0391
Library Science	0399
Mass Communications	0708
Music	0413
Speech Communication	0459
Theater	0465

EDUCATION

General	0515
Administration	0514
Adult and Continuing	0516
Agricultural	0517
Art	0273
Bilingual and Multicultural	0282
Business	0688
Community College	0275
Curriculum and Instruction	0727
Early Childhood	0518
Elementary	0524
Finance	0277
Guidance and Counseling	0519
Health	0680
Higher	0745
History of	0520
Home Economics	0278
Industrial	0521
Language and Literature	0279
Mathematics	0280
Music	0522
Philosophy of	0998
Physical	0523
Psychology	0525
Reading	0535
Religious	0527
Sciences	0714
Secondary	0533
Social Sciences	0534
Sociology of	0340
Special	0529
Teacher Training	0530
Technology	0710
Tests and Measurements	0288
Vocational	0747

LANGUAGE, LITERATURE AND LINGUISTICS

Language	
General	0679
Ancient	0289
Linguistics	0290
Modern	0291
Literature	
General	0401
Classical	0294
Comparative	0295
Medieval	0297
Modern	0298
African	0316
American	0591
Asian	0305
Canadian (English)	0352
Canadian (French)	0355
English	0593
Germanic	0311
Latin American	0312
Middle Eastern	0315
Romance	0313
Slavic and East European	0314

PHILOSOPHY, RELIGION AND THEOLOGY

Philosophy	0422
Religion	
General	0318
Biblical Studies	0321
Clergy	0319
History of	0320
Philosophy of	0322
Theology	0469

SOCIAL SCIENCES

American Studies	0323
Anthropology	
Archaeology	0324
Cultural	0326
Physical	0327
Business Administration	
General	0310
Accounting	0272
Banking	0770
Management	0454
Marketing	0338
Canadian Studies	0385
Economics	
General	0501
Agricultural	0503
Commerce Business	0505
Finance	0508
History	0509
Labor	0510
Theory	0511
Folklore	0358
Geography	0366
Gerontology	0351
History	
General	0578
Ancient	0579
Medieval	0581
Modern	0582
Black	0328
African	0331
Asia, Australia and Oceania	0332
Canadian	0334
European	0335
Latin American	0336
Middle Eastern	0333
United States	0337
History of Science	0585
Law	0398
Political Science	
General	0615
International Law and Relations	0616
Public Administration	0617
Recreation	0814
Social Work	0452
Sociology	
General	0626
Criminology and Penology	0627
Demography	0938
Ethnic and Racial Studies	0631
Individual and Family Studies	0628
Industrial and Labor Relations	0629
Public and Social Welfare	0630
Social Structure and Development	0700
Theory and Methods	0344
Transportation	0709
Urban and Regional Planning	0999
Women's Studies	0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES

Agriculture	
General	0473
Agronomy	0285
Animal Culture and Nutrition	0475
Animal Pathology	0476
Food Science and Technology	0359
Forestry and Wildlife	0478
Plant Culture	0479
Plant Pathology	0480
Plant Physiology	0817
Range Management	0777
Wood Technology	0746
Biology	
General	0306
Anatomy	0287
Biostatistics	0308
Botany	0309
Cell	0379
Ecology	0329
Entomology	0353
Genetics	0369
Limnology	0793
Microbiology	0410
Molecular	0307
Neuroscience	0317
Oceanography	0416
Physiology	0433
Radiation	0821
Veterinary Science	0778
Zoology	0472
Biophysics	
General	0786
Medical	0760

EARTH SCIENCES

Biogeochemistry	0425
Geochemistry	0996
Geodesy	0370
Geology	0372
Geophysics	0373
Hydrology	0388
Mineralogy	0411
Paleobotany	0345
Paleoecology	0426
Paleontology	0418
Paleozoology	0985
Palynology	0427
Physical Geography	0368
Physical Oceanography	0415

HEALTH AND ENVIRONMENTAL SCIENCES

Environmental Sciences	0768
Health Sciences	
General	0566
Audiology	0300
Chemotherapy	0992
Dentistry	0567
Education	0350
Hospital Management	0769
Human Development	0758
Immunology	0982
Medicine and Surgery	0564
Mental Health	0347
Nursing	0569
Nutrition	0570
Obstetrics and Gynecology	0380
Occupational Health and Therapy	0354
Ophthalmology	0381
Pathology	0571
Pharmacology	0419
Pharmacy	0572
Physical Therapy	0382
Public Health	0573
Radiology	0574
Recreation	0575
Speech Pathology	0460
Toxicology	0383
Home Economics	0386

PHYSICAL SCIENCES

Pure Sciences

Chemistry	
General	0485
Agricultural	0749
Analytical	0486
Biochemistry	0487
Inorganic	0488
Nuclear	0738
Organic	0490
Pharmaceutical	0491
Physical	0494
Polymer	0495
Radiation	0754
Mathematics	0405
Physics	
General	0605
Acoustics	0986
Astronomy and Astrophysics	0606
Atmospheric Science	0608
Atomic	0748
Electronics and Electricity	0607
Elementary Particles and High Energy	0798
Fluid and Plasma	0759
Molecular	0609
Nuclear	0610
Optics	0752
Radiation	0756
Solid State	0611
Statistics	0463

Applied Sciences

Applied Mechanics	0346
Computer Science	0984
Engineering	
General	0537
Aerospace	0538
Agricultural	0539
Automotive	0540
Biomedical	0541
Chemical	0542
Civil	0543
Electronics and Electrical	0544
Heat and Thermodynamics	0348
Hydraulic	0545
Industrial	0546
Marine	0547
Materials Science	0794
Mechanical	0548
Metallurgy	0743
Mining	0551
Nuclear	0552
Packaging	0549
Petroleum	0765
Sanitary and Municipal	0554
System Science	0790
Geotechnology	0428
Operations Research	0796
Plastics Technology	0795
Textile Technology	0994

PSYCHOLOGY

General	0621
Behavioral	0384
Clinical	0622
Developmental	0620
Experimental	0623
Industrial	0624
Personality	0625
Physiological	0989
Psychobiology	0349
Psychometrics	0632
Social	0451

The undersigned recommend to the
Faculty of Graduate Studies and Research
acceptance of the thesis

PSEUDOMEMORY, HYPNOSIS AND REPORTING BIAS

submitted by Evelyn M. Bures, B.Sc.
in partial fulfillment of the requirements for
the degree of Master of Arts

Thesis Supervisor

Chair, Department of Psychology

Carleton University
May, 1993

ABSTRACT

This study replicated and extended an experiment conducted by Spanos and McLean (1986). Spanos and McLean found that 11 out of 33 highly hypnotizable hypnotic subjects accepted the suggestion of a pseudomemory (loud noises on a previous quiet night). After hidden observer instructions, only two out of 11 subjects still maintained that the noises had been real. The present experiment replicated the Spanos and McLean procedure, and in addition to hypnotic subjects, included a low-hypnotizable simulator group and a high-hypnotizable imagery group. The pseudomemory was accepted significantly more often by simulators than by hypnotic subjects (60% and 32% respectively), and all groups showed a higher rate of pseudomemory acceptance after an additional cue regarding the nature of the noises. When awakened, approximately half of each group maintained that the noises had really occurred. After "hidden observer" instructions, only three out of six hypnotic subjects, two out of five simulators, and two out of eight imagery subjects still maintained that the noises had been real. These findings suggest that hypnotically induced pseudomemories may reflect reporting biases rather than memory alteration, and that the demands inherent in the pseudomemory test paradigm may be sufficient to account for subjects responding without positing actual distortions in memory.

Acknowledgements:

I would like to thank Dr. Nicholas Spanos

for his consistent and expert guidance and support.

I would also like to thank my parents, Peggy and Jerry,

for nurturing in me the confidence and dedication that are

required in any great undertaking.

Finally, I would like to thank my husband, Norman, for his

great patience and unfailing love.

Table of Contents

LIST OF TABLES

ACCURACY OF MEMORY

Much research to date has demonstrated that eyewitness testimony is frequently inaccurate (e.g.,Loftus, 1979). For instance, research conducted by Loftus and her associates (e.g. Loftus, 1977; Loftus & Greene, 1980) demonstrated that recall and recognition performance are often unreliable and can be adversely affected by misleading postevent information. These studies usually involved subjects first viewing a sequence of slides illustrating an event such as a traffic accident. Additional information was given to the subjects in the form of a written account of what had taken place. In the "misled" condition, subjects received inaccurate information concerning an important fact contained in the slide sequence. For example, in the original slide presentation, subjects had been shown a car at a stop sign. However, the postevent narrative read by subjects described a yield sign instead of a stop sign. Subjects in the control group were not exposed to any specific information about this detail in the narrative. After the narrative presentation, all subjects were given a two-alternative, forced-choice recognition test on what they had seen in the slides. The question concerning the critical fact (e.g. What was the sign at the intersection?) allowed subjects to choose between the detail that was presented in the slides (stop sign) and that presented in the narrative (yield sign). It was consistently found that the control subjects performed more accurately on the test question than did the misled subjects. Loftus and her associates hypothesized that misleading information replaces the original material and that the original information is irreversibly lost from memory (Loftus, Miller & Burns, 1978). Other researchers

contend that the original information is not permanently lost, but is simply inaccessible. For instance, Bekerian and Bowers (1983) showed subjects 24 slides, which included a picture of a traffic sign (e.g. stop sign). After the slide presentation, some subjects were shown information that was consistent (e.g. stop sign), while others received information that was misleading (e.g. yield sign). In the testing portion of the experiment, subjects were shown pairs of slides and were required to identify which of the two slides was shown in the first sequence. One group saw the slides in random order (random test condition) while the other group were shown them in the original sequence (sequential test condition). The important test item required the subject to choose between a stop sign and a yield sign.

The subjects in the random test condition who were given consistent postevent information performed better on the critical test item (94% correct) than those who were given misleading information (64% correct). However, performance did not differ between the consistent (85% correct) and misleading information (87% correct) groups in the sequential test condition. These researchers concluded that the original information was not completely lost due to exposure to the misleading cue, rather it was rendered inaccessible in the random test condition.

McCloskey and Zaragoza (1985) also argued that misleading postevent information does not interfere with the memory of the original event. They claimed that the procedure used in studies that do claim memory deterioration following postevent suggestions (e.g. Loftus et al., 1978) was inappropriate. McCloskey and Zaragoza (1985) modified the testing procedure used by Loftus et al. (1978) by

changing the choice of items in the recognition phase. For example, the subjects viewed a series of slides, one of which showed a man holding a hammer (the critical item). The subjects were then given a written description of the event shown in the series of slides. Subjects in the control condition received no specific information concerning the critical item. For those in the misled condition, the critical item was referred to as a screwdriver in the postevent narrative. All subjects were then administered a recognition test on the slide series. The original test procedure (Loftus et al., 1978) involved choosing between the original item (hammer) depicted in the slide, and a misleading item (screwdriver). The modified procedure did not include the misleading item (screwdriver) in the recognition test. Instead, the subjects were asked to choose between the original item (hammer) and a new item (wrench). These researchers maintained that this procedure enabled them to determine whether misleading information impairs the memory of the original item. They argued that if misleading information does affect memory for the original test item, then control subjects should perform better than the misled subjects on the recognition test even though the recognition test does not include the misleading item. However, if misleading information does not affect original item memory, then the performance of the misled and control subjects should not differ. Using this procedure, no difference in recognition performance was found between the misled and the control subjects. McCloskey and Zaragoza (1985) concluded that the misleading information had no significant effect on the memory of the original event.

Regardless of whether postevent information actually changes original

memories, it is clear that recall and recognition are often inaccurate. The incompleteness and inaccuracy that frequently characterizes recall has been a concern to those in the legal profession as well as to those pursuing memory research in the area of psychology. The interests of those involved in the judicial system are practical; how to enhance accurate recall among clients and witnesses.

HYPNOSIS AND RECALL

In the forensic context, hypnotic procedures have been used to enhance memory recall with mixed results. The general public (i.e. the jury) commonly believes that recall under hypnosis is accurate. Much evidence to date invalidates this assumption (Smith, 1983; Wagstaff, 1984) and increasingly, courts have ruled against accepting hypnotically obtained testimony. A number of investigators (Smith, 1983; Relinger, 1984; Orne, Soskis, Dinges & Orne, 1984; Sheehan, 1985) have thoroughly reviewed the data concerning the effect of hypnotic procedures on recall. Of particular concern to the legal community is the possibility of error in the retelling of events by the hypnotized witnesses while being interrogated.

Hypnotic procedures have been successfully employed as a memory enhancer in several criminal cases (eg. Arons, 1967; Reiser, 1976; Teitelbaum, 1969). These case reports have led some police and other investigative authorities to use hypnotic procedures in the belief that they can improve recall. An anecdote often used to demonstrate the efficacy of hypnosis in restoring lost memory involves the Chowchilla kidnapping case (People v. Woods et al., 1977). A bus driver and 26 children were

forced at gunpoint into vans and then into a rectangular tomb underground in a remote rock quarry. The bus driver and two boys succeeded in escaping and contacted the police. The bus driver could not remember the licence plate numbers of the kidnapper's vans. However, following an hypnotic induction procedure, he recalled part of the licence number. This resulted in the apprehension and arrest of the criminals involved.

Although cases such as this are commonly employed to support the utility of hypnotic procedures for enhancing recall, it is difficult to substantiate the role played by hypnotic procedures. Orne (1979) pointed out that many licence plate numbers have been recalled by hypnotic witnesses for cars that could not have been involved in the crime. O'Connell, Shor, & Orne (1970) demonstrated that subjects tended to recall more information following hypnotic procedures, but also to report more inaccuracies. They regressed their subjects back to their childhoods and asked them to describe other children in their school room class. They were surprised to discover that some of the individuals so vividly described by these subjects were children who had not been in their class.

Dhanens and Lundy (1975) investigated the question of hypnotic enhancement of memory using low-hypnotizable and high-hypnotizable hypnotic subjects. All subjects learned a meaningful prose passage (short biography) and a nonmeaningful list of 13 nonsense syllables. All subjects attempted recall of these items, in order, approximately one week later and in one of six experimental conditions. Each group contained equal numbers of high and low hypnotizable subjects. Four out of the six

groups underwent nonhypnotic procedures; 1) control group, 2) relaxation group, 3) regression group (instructed to regress back to original session), and 4) motivation group (instructed to try hard). The last two groups were given a hypnotic induction procedure followed by; 5) regression instructions, and 6) motivational encouragement. High-hypnotizable subjects who had received both the hypnotic induction and motivational instructions recalled the meaningful material significantly better than the other groups. Dhanens and Lundy (1975) concluded that hypnosis played a role in increased ability to recall, but that motivation was also an important contributing factor.

On the other hand, Cooper and London (1973) found that hypnosis did not improve recall in their low and high hypnotizable subjects. Each subject attempted to remember the information contained in an article about a rare chemical. Two weeks after reading the article, subjects were asked 33 questions about the article. Each subject was tested once following hypnotic procedures, and once while they were awake, with the order of recall counterbalanced. Hypnotic procedures did not improve memory. However, subjects did recall significantly better on the second test.

The nature of the information being remembered is an important factor when the data are being used to validate forensic procedures. Of particular importance is whether procedures are forensically relevant. McEwan and Yuille (1982) tested the recall of highly hypnotizable subjects concerning the details of a 90 second long videotape of a simulated bank robbery. Subjects were tested one week later about the

robber's appearance. No significant difference in recall was found between hypnotic and nonhypnotic groups.

Putnam (1979) used a videotape of a car-bicycle accident as the memory test item, and then posed a series of questions about the event. No significant difference was found between nonhypnotic and hypnotic subjects.

Putnam also investigated the role of hypnosis in suggestibility and confidence of recall. Subjects were asked five leading questions (e.g. "Did you see the stop sign?") as well as nonleading questions regarding the film they had just seen. No difference in accuracy of recall was found between hypnotic and nonhypnotic subjects on the objective questions. Hypnotic subjects performed less accurately than nonhypnotics on the six leading questions. No difference in confidence level was found between the two groups, even though the hypnotics showed more inaccuracies.

Several experimenters (Putnam, 1979; Zelig & Beidleman, 1981) have found that hypnotic and nonhypnotic subjects displayed equivalent levels of confidence in the accuracy of their recall, even though the hypnotic subjects reported more inaccuracies than those in the nonhypnotic condition. Others have reported equal recall accuracy in nonhypnotics and hypnotics, yet hypnotics displayed more confidence in their responses (Spanos, Quigley, Gwynn, Glatt & Perlin, 1991; Sheehan & Tilden, 1983; Whitehouse, Dinges, Orne & Orne, 1988).

Due to the results of experiments such as these, some investigators have lobbied for limitations on the legal admissibility of evidence obtained via hypnotic interview.

PSEUDOMEMORY AND HYPNOSIS

Several researchers (e.g. Orne, 1979; Diamond, 1980; Laurence & Perry, 1983) advocate the view that hypnotic interrogation encourages the fabrication of pseudomemories by the eyewitness. According to this hypothesis, the interrogator unwittingly cues the witness as to the expected answer to a question. The respondent internalizes the suggestion made by the interrogator, gives the desired response, and furthermore, believes the response to be an accurate accounting of the original event. According to this hypothesis, hypnosis creates a situation in which the witness cannot distinguish between the real facts and a confabulated memory (i.e. pseudomemory) of the event.

Orne (1979) suggested that hypnosis may encourage confabulation when the interview contains leading questions. He cautioned the legal community against using hypnotic procedures as memory enhancers, as the subject may pick up subtle cues during interrogation, integrate the false information, and be unable to distinguish between real and false memories of the event.

It has been found in several studies that highly hypnotizable subjects were more likely to accept the veracity of a false memory than were low hypnotizable subjects. For example, Barnier and McConkey (1992) exposed subjects to slides of a purse-snatching episode followed by three misleading suggestions about the event, and then tested the subjects three times on recall. They found that false memory reports did not differ between hypnotics and nonhypnotics, but that highly hypnotizable subjects were more likely than lows to report pseudomemories.

Several studies have succeeded in reducing pseudomemory reports by modifying the testing procedure. McCann and Sheehan (1987) showed their subjects a videotape of a staged bank robbery, then exposed them to false suggestions. It was suggested that the thief had worn a dark stocking mask (he had not), that he had been swearing (he had not), and that he had entered from the right side (he did not). Prior to the recall test, half of the subjects were administered a recognition test. The subjects who received the recognition test were significantly less likely to report pseudomemories. These researchers concluded from their data that memory for the original videotape event was not irretrievably lost.

Murray, Cross & Whipple (1992) investigated whether pseudomemory response represents memory distortions or simply response bias. They offered a monetary incentive to subjects in three out of four experimental groups in order to encourage them to differentiate between a false suggestion and a real occurrence. Pseudomemory reports were significantly lower among subjects who received a financial reward than among those who did not. The experimenters suggested that pseudomemory effects in highly hypnotizable subjects may be decreased by the offer of an incentive for unbiased reports.

McConkey, Labelle, Bibb & Bryant (1990) tested high and low hypnotizable subjects on pseudomemory reporting. Subjects were first questioned in the initial experimental environment, and then were questioned again by a different experimenter away from the initial testing location. Highly hypnotizable subjects were more likely to report pseudomemories than low hypnotizable subjects. The

responses of the two groups did not differ in the hypnotic and nonhypnotic conditions. Most important, pseudomemory reporting decreased when it was tested away from the initial testing location by a different researcher. Only one subject out of a total of fourteen still reported the false suggestion. McConkey et al. (1990) concluded that pseudomemory reporting may be a response to the social demands of the experimental setting, or may arise from a temporary confusion of the subject's memory.

Lynn, Weekes & Milano (1989) compared the responses of hypnotic and simulator subjects to the suggestion of a phone call and conversation, and a real phone call and conversation. The hypnotic subjects were able to distinguish objective events from suggested ones. Only 11% of the hypnotic group reported that they heard a phone ring following the suggestion on an open-ended report, while none said that they had heard a phone ring in response to a forced-choice question. Simulator and hypnotic subjects did not differ in their responses across experimental conditions.

Weekes, Lynn, Green & Brentar (1992) gave pseudomemory suggestions to highly hypnotizable and task-motivated subjects. The task-motivated subjects were more likely to respond to the noise suggestion. However, 69% of all the subjects who responded to the noise suggestion also reported pseudomemories. The extent of pseudomemory reporting was not decreased by informing subjects that they could differentiate between fantasy and reality while in a state of deep concentration. Seventy-five percent of highly hypnotizable subjects, and 54% of the task-motivated subjects continued to report pseudomemories, even after deep concentration instructions. Highly hypnotizable subjects reported more unsuggested noises than

task-motivated subjects. Those subjects who reported pseudomemories were more confident in their accuracy of memory in this task than those who maintained that the noises had been imagined.

Spanos, Gwynn, Comer, Baltruweit & deGroh (1991) showed that hypnotic and nonhypnotic subjects who confidently identified a mugshot after witnessing a videotaped crime, disavowed their earlier identifications during cross-examination. In another experiment, Spanos et al. (1989) reported that those highly hypnotizable subjects who were given instructions which allowed them to disavow their earlier mugshot identifications without discrediting themselves (hidden observer instructions), showed the highest rate of disavowal. Cross-examination which implied that the subjects had been dishonest or inattentive resulted in the lowest rate of disavowal. Clearly the reporting of pseudomemories can be influenced by various factors such as motivation, location, and experimental procedures such as recognition tests and hidden observer instructions.

THE PRESENT EXPERIMENT

The present experiment sought to replicate and extend the results of an earlier study in which pseudomemories were created in highly hypnotizable subjects. Laurence and Perry (1983) claimed to have demonstrated hypnotic memory confabulation. Highly hypnotizable subjects were first asked to choose a night during which they had slept peacefully with no awakenings or dreams. They were then asked to describe their activities during the half hour before they went to bed on the

night in question. A procedure adapted from Orne (1979) was used to elicit the creation of false memories. This procedure involves the administration of "hypnotic age regression" instructions which take the subject back to that particular night. While the subject is "reliving" this night, the experimenter asks if the subject hears any loud noises. Since the subject had previously described the night as quiet and uneventful, this question constitutes a subtle suggestion for the subject to incorporate loud noises into their experience. Some subjects gave a positive response, thereby accepting the idea that they heard loud noises on the night in question.

In Laurence and Perry's (1983) study, 13 out of 27 highly hypnotizable subjects reported postexperimentally that they heard loud noises while reliving their chosen night and believed that these noises actually occurred on that night rather than having been suggested. These results were interpreted as support for the hypothesis that pseudomemories can be created within a hypnotic situation that includes subtle suggestions formulated to encourage this phenomenon. Furthermore, these results were interpreted as showing that this memory alteration persists even after the experiment is over, as evidenced by post-hypnotic interviews. Unfortunately, as Laurence and Perry's (1983) study did not include a nonhypnotic group, conclusive statements cannot be made concerning the effect of the hypnotic procedure on the pseudomemory creation phenomenon.

Interestingly, an explanation can be offered for these data without accepting the notion that hypnotic subjects cannot distinguish between real and false memories. This account suggests that highly hypnotizable people respond to suggestions in a way

that will maintain their self-image as "good" hypnotic subjects (Spanos, 1983). Some subjects in the Laurence and Perry experiment may have thought that the question, "Did you hear any noises?" was a trick and chose to respond with the relatively safe and truthful answer that they did not hear any noises. Others correctly understood that the question was a subtle suggestion to incorporate the information about noises into the situation being "relived". Concluding that a hypnotized person would accept the suggestion as reality, and seeing themselves as such, these subjects gave the positive response of yes. Subjects who answered yes to the question and maintained that their answer was correct even after the hypnotic procedure was terminated, may have done so in an effort not to discredit their earlier response. In short, pseudomemory reports may reflect reporting biases rather than actual changes in memory.

Spanos and McLean (1986) addressed this issue in their experiment by using hidden observer instructions to determine whether subjects can distinguish between real and suggested information. Hidden observer instructions (Hilgard, 1977; Spanos, 1983) were administered to those subjects who responded positively to the suggestion that they had heard loud noises on the night in question. These instructions stipulate that there exists a hidden part of the mind that can differentiate between real and suggested events and that the experimenter can communicate with this hidden observer. Spanos and McLean (1986) found that 11 out of 33 subjects responded affirmatively to the loud noise suggestion. However, out of these 11 subjects only 2 still claimed to have heard the loud noise after the administration of the hidden

observer instructions. At the end of the session, the subjects were advised that they could now remember their hidden part and what was said during that time. Four subjects now indicated that the noises had really occurred. These contextually induced shifts in whether an event was reported as real or as imaginary suggest that highly hypnotizable subjects can differentiate between reality and suggestion when doing so does not undercut their self-image as a responsive hypnotic subject.

The present study attempted to further examine this phenomenon by administering the procedure used by Spanos and McLean (1986) to two additional experimental groups; nonhypnotics (imagery) subjects and simulators. Only highly hypnotizable subjects were used for the hypnotic and imagery groups because low hypnotizables fail to respond to suggestions for memory distortion. Simulators were used to examine the extent to which the experimental procedure contained cues which informed subjects about the appropriate way to respond. Simulators were explicitly instructed not to experience suggested effects. Consequently, their responses can be seen as reflections of their understanding of the experimental demands in the absence of any cognitive or perceptual distortions brought about by suggestions. In order to ensure that simulators do not inadvertently experience suggested effects, only low hypnotizables are assigned to this condition. An addition to the Spanos and McLean (1986) study involved the substitution of a stronger cue in order to elicit greater response from the subjects. This cue was identical to the one used by Labelle, Laurence, Nadon & Perry (1990). The cue consisted of first enquiring of the subjects if they hear the loud noises, then suggesting that the noises might be that of a door

slamming or a car back-firing. Following Labelle et al. (1990), if the subject did not report hearing the noises, they were prompted a second time with instructions to listen carefully and to tell the experimenter what time they thought it was. Labelle et al. (1990) found that high (45%) and medium (46%) hypnotizable subjects were more likely to believe in the veracity of the pseudomemory than were low (0%) hypnotizable subjects.

Subjects in the nonhypnotic group were administered the same procedure as the hypnotic group with the exception of the hypnotic induction and the addition of instructions to relax and vividly imagine the suggestions given by the experimenter. A large number of studies (reviewed by Barber, 1969), indicate that hypnotic and nonhypnotic subjects responded equivalently to a wide range of suggestions. One purpose of the present study was to determine the extent to which the "pseudomemory" phenomenon is due to the administration of the hypnotic induction procedure.

As previously stated, the simulator subjects were chosen from those individuals exhibiting a low level of hypnotizability. Following Orne (1979), these subjects were instructed by someone other than the experimenter to fake hypnosis to the best of their ability. Typically, simulators respond to a greater number of suggestions than either hypnotic or nonhypnotic nonsimulators (i.e., "reals") (see deGroot and Gwynn, 1989 for a review). Simulators are administered the same experimental procedures as hypnotics, but are instructed not to experience suggested effects. Their only task is to exhibit the appropriate behavioral responses, relying on their own knowledge of

hypnosis and the perceived demands of the experiment. The performance of simulators reveals the extent to which the data obtained from hypnotic subjects can be duplicated by nonhypnotic subjects who simply respond to the social demands of the experiment.

Simulators typically outperform reals. For example, Barber and Calverly (1966) found that simulators exhibited higher levels of recognition and recall amnesia than did reals. Spanos, Radtke-Bodorick & Stam (1980) found that simulators rated their amnesia as feeling more involuntary than did reals. Spanos, Radtke, Hodgins, Stam & Bertrand (1983) showed that more simulators than reals described hallucinated objects as having the same properties as actual objects (e.g. colour and texture). These studies suggest that reals are more likely than simulators to respond incompletely to difficult test items.

Orne (1959) argued that simulators and reals are exposed to identical demand characteristics. He attributed behavioral differences found between these two groups to the presence of an hypnotic state in the reals. However, Sheehan (1970) showed that simulators and reals are responding to different experimental demands. Real hypnotic subjects are limited in their responding by implicit demands for honesty in reporting their experiences. Simulators do not have to subjectively experience suggested effects, they need only respond as they believe hypnotized person would respond. Instructions administered before the experiment encourage the simulators to fake being deeply hypnotized. They are not required to be honest about their experiences, only to imitate as best they can the behaviour of a hypnotized person. In

their effort to fulfill their obligations and fool the experimenter, simulators tend to respond more completely to difficult task suggestions than reals (see deGroot and Gwynn, 1989).

It was expected that more simulators than hypnotic or nonhypnotic subjects would respond positively to the loud noise cue. This was predicted on the assumption that the simulators would eagerly accept any suggestion in their efforts to appear deeply hypnotized. Hypnotics and nonhypnotics were expected to respond in equal numbers to the loud noise suggestion.

METHOD

Subjects

All experimental groups consisted of university students who had completed the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos et al., 1983) and participated in the study for course credit or pay. The 44 hypnotic subjects and the 33 imagery subjects scored 5 - 7 on the objective dimension of the CURSS. The simulator group was comprised of 30 low hypnotizable university students who had scored 0 - 2 on the CURSS.

Procedure

Subjects in all three conditions were individually greeted by a person other than the experimenter. Simulators were read written instructions which asked them to behave as if they were excellent hypnotic subjects and informed them that the experiment would be terminated if the researcher guessed that they were faking. These subjects were encouraged to use everything they had learnt about hypnosis plus any cues given by the experimenter in order to give a convincing performance. Nonsimulators were also greeted by someone other than the experimenter but were not read the simulation instructions. All subjects were then brought to the experimenter and introduced as either a hypnosis or imagery subject. (See Appendix 1 for simulator instructions)

Simulator and hypnotic subjects were orally administered a ten minute hypnotic induction procedure (modified from Barber, 1969) followed by instructions to choose a night within the past week during which they had slept peacefully with no

memory of dreams or awakenings. (See Appendix 2 for hypnotic induction procedure) They were then regressed to that night and asked whether they heard any loud noises. (See Appendix 3 for regression instructions). They were prompted to listen carefully and to tell the experimenter if they heard any noises. If the subjects reported that they did not hear the noises, they were prompted a second time with instructions to attend carefully, to tell the researcher what time they thought it was, and whether they were aware of the noises now. These instructions were taken verbatim from Labelle et al. (1989). Those subjects who did not report hearing loud noises were awakened, debriefed, thanked for their participation and taken to a person other than the experimenter to be dismissed. Simulators were informed by this person that they could now stop faking hypnosis. (See Appendix 4 for noise instructions)

Subjects who answered that they did hear loud noises were asked to describe the noises in detail. They were then awakened and asked the following questions;

1) Do you remember waking up last ___ ___ night?
2) Did you hear any noises?
3) Please describe the noises in as much detail as you can.
4) Do you think that the noises that woke you up happened last _____ night or did you just imagine them while you were hypnotized?

Hidden observer instructions (Hilgard, 1977) were preceded by a hypnotic induction procedure. These instructions were taken from Spanos and McLean (1986)

and suggest that the subject has a hidden part that knows the truth concerning what really happened on the night in question and knows what is occurring throughout the experiment. A particular cue (touch on the shoulder) was employed to enable the experimenter to communicate with the hidden part. When the experimenter touched the subject on the shoulder, the subject was again asked question #4. The experimenter withdrew her hand from the subject's shoulder, which meant that the researcher was now speaking to the hypnotized part of the subject, and again question #4 was asked. The subjects were then instructed that they could now remember their hidden part and were asked question #4 for the last time. Subjects were debriefed, thanked and brought to a person other than the experimenter to be dismissed. (See Appendix 5 for hidden observer instructions)

Imagery subjects underwent the same procedure as the hypnotics except for the substitution of imagery instructions for hypnotic procedures. The imagery instructions included suggestions to deeply relax and to vividly imagine subsequent descriptions. (See Appendix 6 for imagery instructions)

RESULTS

The initial question, "Do you hear the loud noises?" prompted only 23% of the hypnotics (10 out of 44 subjects), 40% of the simulators (12 out of 30 subjects), and 27% of the imagery subjects (9 out of 33 subjects) to give an affirmative reply (see Table 1). Chi Square Analysis yielded nonsignificant results (x^2 (df = 2) = 2.65, x^2 crit.(0.05) = 5.99).

Additional cues were given regarding the nature of the noises, which were designed to encourage subjects to re-evaluate their earlier response. This strategy yielded an increase in loud noise responses. Now a total of 32% of the hypnotics (14 out of 44 subjects), 60% of the simulators (18 out of 30 subjects), and 51% of the imagery subjects (17 out of 33 subjects) reported that they had heard the loud noises (see Table 2). Chi square analysis found a significant difference between the groups' responses after the cued question (x^2 (df = 2) = 6.34, $p < .05$, x^2 crit. = 5.99). Additional analysis between pairs of groups found a significant difference between the responses of the hypnotic and simulator groups (x^2 (df = 1) = 5.77, $p < .02$, x^2 crit. = 5.41). The simulators more frequently gave an affirmative response to the loud noise question than did the hypnotic subjects. The differences in loud noise responses between imagery subjects and simulators (x^2 (df = 1) = 0.46, x^2 crit.(0.05) = 3.84) and between imagery and hypnotic subjects, (x^2 (df = 1) = 3.04, x^2 crit.(0.05) = 3.84) were not significant.

Table 1

Number of Subjects in Each Treatment Group who Responded Yes or No to the Loud Noise Question:

	Yes	No	
Hypnotics	10	34	(23% said yes)
Simulators	12	18	(40% said yes)
Imagery	9	24	(27% said yes)

Table 2

Number of Subjects in Each Treatment Group who Responded Yes or No to the Loud Noise Question Plus Additional Cue:

	Yes	No	
Hypnotics	14	30	(32% said yes)
Simulators	18	12	(60% said yes)
Imagery	17	16	(51% said yes)

The hypnotic subjects were instructed to awaken, and then all the subjects who had accepted the loud noise suggestion were asked whether they thought that the noises had really occurred or were only imagined while they had been hypnotized/relaxed. Forty-three percent of these hypnotics (6 out of 14 subjects), 39% of these simulators (7 out of 18 subjects), and 47% of these imagery subjects (8 out of 17 subjects) reported that the noises had really occurred. Chi square analysis (x^2 (df = 2) = 0.24, x^2 crit.(0.05) = 5.99) indicated no significant differences between the groups (see Table 3).

Hidden observer instructions were administered, and again the subjects were asked whether they thought that the noises had been real or imagined. Of the six hypnotics who maintained (when awake) that the noises had been real, three reported "real", and three said "imagined" after hidden observer instructions. Of those seven simulators who said (when awake) that the noises had been real, only two still maintained this after hidden observer instructions. Six out of the eight imagery subjects who reported that the noises had been real (when awake) now maintained that they had only imagined them. Most subjects in all three groups who said that they had imagined the noises before hidden observer instructions continued to report this after hidden observer instructions (7 out of 8 hypnotics, 8 out of 11 simulators, and 8 out of 10 imagery subjects).

Table 3

Number of Subjects in Each Treatment Group who Responded when Awake whether the Noises had been Real or Imagined:

	Real	Imagined
Hypnotics	6	8 (43% said real)
Simulators	7	11 (39% said real)
Imagery	8	9 (47% said real)

Chi square analysis yielded no significant differences between the groups (see Table 4). (Real-Real:Real-Imag. (x^2 (df = 2) = 1.07) Imag.-Real:Imag.-Imag. (x^2 (df = 2) = 0.62) Real-Imag.:Imag.-Real (x^2 (df = 2) = 1.13) Real-Real:Imag.-Imag. (x^2 (df = 2) = 0.37) Real-Imag.:Imag.-Real (x^2 (df = 2) = 0.36) Real-Imag.:Imag.-Imag. (x^2 (df = 2) = 0.41) x^2 crit. (0.05) = 5.99).

In short, these data indicate that only a small minority of the subjects in the three treatments who indicated that they heard the noises, consistently reported believing that the noises were real throughout all phases of the procedure. More specifically, only 3 out of the 14 hypnotic subjects (21%), 2 out of the 16 simulators (11%), and 2 out of the 17 imagery subjects (12%) consistently reported believing that the suggested noises really occurred.

Table 4

Number of Subjects in Each Treatment Group who Responded Real or Imagined After Hidden Observer Instructions:

	Real-Real*	Real-Imag.	Imag.-Real	Imag.-Imag.
Hypnotics	3	3	1	7
Simulators	2	5	3	8
Imagery	2	5	2	8

* Column headings indicate responses before and after hidden observer instructions. Real-Real means the subject responded that the noises had been real when awake, and answered the same thing after the hidden observer instructions. Real-Imag. indicates that the noises had been reported as real when awake, and imagined after hidden observer instructions. Imag.-Real means that the subject reported that the noises were imagined when awake, and real after hidden observer instructions. Imag.-Imag. indicates that the subject said that the noises had been imagined when awake, and then maintained this response after hidden observer instructions.

DISCUSSION

The initial suggestion that loud noises occurred during a quiet night failed to elicit a pseudomemory response in a large proportion of subjects. Only 23% of the high hypnotizables in the hypnotic condition (10 out of 44 subjects) accepted the loud noise suggestion. These results are much lower than those of Weekes et al. (1992), who found that 69% of their high hypnotizable subjects reported pseudomemories. They are also lower than those found by Laurence and Perry (1983), who reported that 48% of the high hypnotizable subjects accepted the loud noise suggestion, and those of Labelle et al.(1990), who found that 45% of the highly hypnotizable subjects believed in the veracity of the pseudomemory. The results of this study approach those supplied by Spanos and McLean (1986), who found that 33% of the highly susceptible hypnotics accepted the same suggestion. It is possible that unavoidable differences between the studies, such as the experimenter, the specific location, or other subtle characteristics, may have elicited different levels of response.

Subjects in the three groups did not differ in their frequency of "yes" responses to the initial question about noises. Even among the simulators, less than half of the subjects responded to the initial question. These findings suggest that the initial cue did not clearly indicate a specific response, since even the simulators, who were strongly motivated to go along with any suggestion, did not understand that the question called for an affirmative response. The simulators appeared to be unclear about whether a hypnotized person would accept or reject the reality of the suggestion.

However, the addition of a cue which asked the subjects to listen carefully and to tell the experimenter what time they thought it was, identical to the one used by Labelle et al. (1990), increased the pseudomemory reports. Sixty percent of the simulators (18 out of 30 subjects) now reported that the noises had really occurred (an increase of 20% or 6 subjects, compared to the response to the initial suggestion) while 32% of the hypnotics (14 out of 44 subjects, an increase of 11% or 4 subjects) agreed. Simulators responded that the noises had really occurred significantly more often than the hypnotic group. These data support other research (deGroot and Gwynn, 1989) which indicates that simulators typically outperform reals on test items. Simulators are not constrained in their responding by demands to report honestly or to really feel the effects of the suggestions. However, in the present experiment, two cues were necessary to elicit a significant difference between simulators and hypnotics.

Twenty-seven percent of the imagery subjects reported that they heard the noises following the initial cue, while 51% reported hearing the noises after the additional cue (an increase of 24%). No significant differences were found between the hypnotic and imagery subjects in pseudomemory responding, even after the additional cue. These findings replicate those found by Weekes et al. (1992), who reported that highly hypnotizable hypnotic and nonhypnotic subjects did not differ in the frequency of pseudomemory reports. These data are consistent with other studies which have found that imagery and hypnotic subjects behave similarly on suggestion items (Barber, 1969). These findings indicate that acceptance of an untrue statement

does not require prior exposure to a hypnotic induction procedure. In fact, more imagery subjects than hypnotics reported that the noises had been real, which indicates that suggestions for memory change are at least as readily accepted in nonhypnotic as in hypnotic test conditions.

The hidden observer instructions were designed to allow subjects to reverse their earlier reports without losing face or presenting themselves as dishonest or foolish. These suggestions have successfully reversed the responses of subjects in previous studies (Spanos and McLean, 1986; Spanos et al, 1989). Such reversals indicate that true memory alteration cannot be inferred from subjects' initial responses, and that subjects will go back on earlier statements given the motivation to do so. There were no differences between the three experimental groups, following hidden observer instructions. Three out of the six hypnotics who reported that the noises had been real before the hidden observer instructions reversed their statements after the instructions, and now maintained that the noises had been only imagined. The majority of the imagery and simulator subjects who had said that the noises had really occurred also disavowed the veracity of noises after hearing the hidden observer instructions. These results support those of other studies (Spanos et al., 1989; Spanos & McLean, 1986) which also found that instructions that prompted subjects to reassess the truth of the event resulted in testimony reversal.

The responses of the simulators to the cues and to the hidden observer instructions did not differ significantly from those of the hypnotic and nonhypnotic groups. These findings indicate that demands contained in the experimental

procedures could account for the responses of subjects in all three groups. Neither the hypnotic induction procedure, nor instructions to vividly imagine the suggestions resulted in responses that were different from those who were told to fake the behaviour of a hypnotized person. The social demands contained within the experiment were enough to elicit similar responses in all three treatment groups.

Some subjects continued to maintain that the noises had really occurred (three hypnotics, two simulators and two nonhypnotics), even following the hidden observer instructions. However this finding does not demonstrate that memory alteration occurred, because there was no significant differences found between the responses of the simulators and the other two groups.

The major finding of this experiment indicates that a second cue regarding the nature of the misleading suggestion increases pseudomemory reports. This was found significantly more often among simulators than among hypnotics. No significant difference was found between hypnotics and imagery subjects concerning the acceptance of the suggested noises, even after the second cue was administered. These results are consistent with previous findings that simulators respond more often and more completely to suggestions than do reals (deGroot and Gwynn, 1989).

The fact that not all the simulators responded to the pseudomemory suggestion indicates that the cue was ambiguous and that the subjects in the other conditions may have also found the cue ambiguous.

These results are consistent with the findings of others (Spanos & McLean, 1986; McCann & Sheehan, 1987; Murray et al., 1992) that the pseudomemory

phenomenon reflects response bias rather than true memory alteration. Further research is needed to further our understanding of this subject, and experiments need to be designed in such a way as to separate reporting bias from actual memory change.

References

Arons, H. (1967). *Hypnosis in Criminal Investigations.* Springfield, Illinois: Charles C. Thomas.

Barber, T.X., & Calverly, D.S. (1966). Effects on recall of hypnotic induction, motivational suggestions and suggested regression: A methodological and experimental analysis. *Journal of Abnormal Psychology, 71,* 169-180.

Barber, T.X. (1969). *Hypnosis: A Scientific Approach.* New York: VanNostrand Reinhold.

Barnier, A.J., & McConkey, K.M. (1992). Reports of real and false memories: The relevance of hypnosis, hypnotizability and context of memory test. *Journal of Abnormal Psychology, 101,* 521-527.

Bekerian, D.A., & Bowers, J.M. (1983). Eyewitness testimony: were we misled? *Journal of Experimental Psychology: Learning, Memory and Cognition, 9,* 139-145.

Cooper, L.M., & London, P. (1973). Reactivation of memory by hypnosis and suggestion. *International Journal of Clinical and Experimental Hypnosis, 21,* 312-323.

deGroot, H.P., & Gwynn, M.I. (1989). Translogic, duality and hidden observer responding, in *Hypnosis, the Cognitive Behavioral Perspective. In* N. Spanos and J. Chaves (Eds.), Buffalo, New York: Prometheus Press.

Dhanens, T.P., & Lundy, R.M. (1975). Hypnotic and waking suggestions and recall. *International Journal of Clinical and Experimental Hypnosis, 23,* 68-79.

Diamond, B.L. (1980). Inherent problems in the use of pre-trial hypnosis on a prospective witness. *California Law Review, 68,* 313-349.

Hilgard, E.R. (1977). *Divided Consciousness.* New York: Wiley.

Labelle, L., Laurence, J.R., Nadon, R., & Perry, C. (1990). Hypnotizability, preference for an imagic cognitive style, and memory creation in hypnosis. *Journal of Abnormal Psychology, 99,* 222-228.

Laurence, J.R., & Perry, C. (1983). Hypnotically created memories among highly hypnotizable subjects. *Science, 222,* 523-524.

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

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

Loftus, E.F. (1977). Shifting human colour memory. *Memory and Cognition, 5,* 696-699.

Loftus, E.F., & Greene, E. (1980). Warning: Even imagery for faces may be contagious. *Law and Human Behavior, 4,* 323-334.

Lynn, S.J., Weekes, J.R., & Milano, M.J. (1989). Reality versus suggestion: Pseudomemory in hypnotizable and simulating subjects. *Journal of Abnormal Psychology, 98,* 137-144.

McCann, T.E., & Sheehan P.W. (1987). The breaching of pseudomemory under hypnotic instruction: implications for original memory retrieval. *British Journal of Experimental and Clinical Hypnosis, 4,* 101-108.

McCloskey, M., & Zaragoza, M. (1985). Misleading postevent information and memory for events: Arguments and evidence against memory impairment hypotheses. *Journal of Experimental Psychology: General, 114*, 1-16.

McCloskey, M., & Egeth, H.E. (1983). What can a psychologist tell a jury? *American Psychologist, 38*, 550-563.

McConkey, K.M., Labelle, L., Bibb, B.C., & Bryant, R.A. (1990). The relevance of test context. *Australian Journal of Psychology, 42*, 197-205.

McEwan, N.H., & Yuille, J.C. (1982). *The Effect of Hypnosis as an Interview Technique on Eyewitness Memory*. Paper presented at the annual meeting of the Canadian Psychological Association, Montreal, Quebec, June.

Murray, G.J., Cross, H.J., & Whipple, J. (1992). Hypnotically created pseudomemories: Further investigation into the "Memory distortion on response bias" question. *Journal of Abnormal Psychology, 101*, 75-77.

O'Connell, D.N., Shor, R.E., & Orne, M.T. (1970). Hypnotic age regression: An empirical and methodological analysis. *Journal of Abnormal Psychological, Monograph, 76* (3, Part 2).

Orne, M.T., Soskis, D.A., Dinges, D.F., & Orne, E.C. (1984). Hypnotically induced testimony. In Wells, G.C. and Loftus, E.F. *Eyewitness Testimony: Psychological Perspectives*. New York: Cambridge University Press.

Orne, M.T. (1979). The use and misuse of hypnosis in court. International Journal of Clinical and Experimental Hypnosis, 27, 311-341.

People v. Woods et al., No. 63187ABNC (Alameda Co., Cal., December 15, 1977).

Putnam, W.H. (1979). Hypnosis and distortions in eyewitness testimony. *International Journal of Clinical and Experimental Psychology, 27,* 437-448.

Reiser, M. (1976). Hypnosis as a tool in criminal investigation. *The Police Chief, 43(11),* 39-40.

Relinger, H. (1984). Hypnotic hypermnesia. A critical review. *American Journal of Clinical Hypnosis, 26,* 212-225.

Sheehan, P.W. (1970). Methodological analysis of the simulating technique. *International Journal of Clinical and Experimental Psychology, 19,* 83-99.

Sheehan, P.W. (1985). *Memory distortion in hypnosis.* Paper presented at the 10th International Congress of Psychosomatic Medicine and Hypnosis, Toronto, Canada, August.

Sheehan, P.W., & Tilden, J. (1983). Effects of suggestibility and hypnosis on accurate and distorted retrieval from memory. *Journal of Experimental Psychology, 9,* 283-293.

Smith, C. (19 83). Hypnotic enhancement of witnesses: Does it work? *Psychological Bulletin, 94,* 287-407.

Spanos, N.P. (1983). The hidden observer as an experimental creation. *Journal of Personality and Social Psychology, 44,* 170-176.

Spanos, N.P., Gwynn, M.I., Comei, S.L., Baltruweit, W.J., & deGroh, M. (1989). Are hypnotically induced phenomenon resistant to cross-examination? *Law and Human Behavior, 13,* 271-289.

Spanos, N.P., & McLean, J. (1986). Hypnotically created pseudomemories: Memory distortions or reporting biases? *British Journal of Experimental and Clinical Hypnosis, 3,* 155-159.

Spanos, N.P., Radtke, H.L., Hodgins, D.C., Stam, H.J., & Bertrand, L.C. (1983). The Carleton University Responsiveness to Suggestion Scale: Normative data and psychometric properties. *Psychological Reports, 53,* 523-535.

Spanos, N.P., Radtke-Bodorick, H.L., & Stam, H.J. (1980). Disorganized recall during suggested amnesia: Fact or artefact. *Journal of Abnormal Psychology, 89,* 1-19.

Spanos, N.P. Quigley, C.A., Gwynn, M.T., Glatt, R.L., & Per'in, A.H. (1991). Hypnotic interrogation, pretrial preparation and witness testimony during direct and cross-examination. *Law and Human Behavior, 15,* 639-653.

Teitelbaum, M. (1969). *Hypnotic induction techniques.* Springfield, Illinois: Charles C. Thomas.

Wagstaff, G.F. (1984). The enhancement of witness testimony by "hypnosis". A review and methodological critique of the experimental literature. *British Journal of Experimental and Clinical Hypnosis, 22,* 3-12.

Weekes, J.R., Lynn, S.J., Green, J.P., & Brentar, J.T. (1992). Pseudomemory and hypnotized and task-motivated subjects. *Journal of Abnormal Psychology, 101,* 356-360.

Whitehouse, W.G., Dinges, D.F., Orne, E.C., & Orne, M.T. (1988). Hypnotic hypernesia: Enhanced memory accessibility of report bias. *Journal of Abnormal Psychology, 97,* 289-295.

Zelig, M., & Beidleman, W.B. (1981). The investigative use of hypnosis: A word of caution. *International Journal of Clinical and Experimental Psychology, 29(4),* 401-412.

Appendix 1

Simulation Instructions

In this experiment, your task will to behave as if you were an excellent hypnotic subject. The experimenter that you will be working with is Evvy. She is aware that some people in her experiment are going to be faking hypnosis, but she has no idea which subjects they will be. Your task is to convince her that you are an excellent hypnotic subject. This is a difficult task and you may feel at some times that you have given yourself away. Don't worry about that possibility because if the experimenter realizes that you are faking she will stop the experiment immediately. So long as the session continues you will know that you are being successful in faking hypnosis.

I can't tell you how to behave or what to do; you have to use what you know about hypnosis, whatever cues you get from the experimenter, and whatever you learn from the situation to figure out how a deeply hypnotized subject would behave. Keep in mind that you are faking a highly hypnotizable subject and that your task is to pretend that you are going deeply into hypnosis, to perform as you think a deeply hypnotized person would perform during hypnosis, and when you are awakened, to behave as though you had been in hypnosis. In other words, you should fake not only during hypnosis, but afterwards as well, when you are interviewed about your experiences. During the interview you should answer all questions the way you think a person who had been deeply hypnotized would answer them.

When the session with the experimenter is over, she will bring you back to talk to me. I would like you to continue faking until that time. I am the only one that will know that you were faking hypnosis and not in a deep hypnotic trance.

Appendix 2

Hypnotic Induction Procedure

Close your eyes. Your ability to be hypnotized depends entirely on your willingness to cooperate. It has nothing to do with your intelligence. As for your will power -- if you want to, you can pay no attention to me and remain awake all the time. On the other hand, if you pay close attention to what I say, and follow what I tell you, you can easily fall into a hypnotic sleep. Hypnosis is nothing fearful or mysterious. 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 that you are part of the audience, but instead feel part of the story. Your cooperation, your interest, is what I ask for. Your ability to be hypnotized is a measure of your willingness to cooperate. Nothing will be done that will in any way cause the least embarrassment.

Now relax and make yourself entirely comfortable. Relax completely. Relax every muscle of your body. Relax the muscles of your legs. Relax the muscles in your arms. Make yourself perfectly comfortable. Let yourself be limp. Relax more and more, more and more. Relax completely. Relax completely.

Your legs feel heavy and limp, heavy and limp. Your arms are heavy, heavy, heavy as lead. Your whole body feels heavy, heavier, and heavier. You feel tired and sleepy, tired and sleepy. You feel drowsy and sleepy, drowsy and sleepy. Your breathing is slow and regular, slow and regular.

You feel pleasantly drowsy and sleepy as you continue to listen to my voice.

Just keep your thoughts on what I am saying. You are going to get much more drowsy and sleepy. Soon you will be deep asleep but you will have no troubling hearing me. You will not wake up until I tell you. Remember that the dangers of hypnosis are a myth. Nothing will be done that is in any way harmful to you. I shall now begin to count. At each count you will feel yourself going down, down, down, into a deep, comfortable, a deep restful sleep. A sleep in which you will be able to do all sorts of things I ask you to do. 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 and the things I tell you... -- Eight -- nine -- ten -- eleven -- twelve -- deeper and deeper, always deeper sleep... Thirteen -- fourteen -- fifteen. You will always hear me clearly no matter how deeply asleep you may be... Sixteen -- seventeen... deep asleep, fast asleep. Nothing will disturb you. You are going to experience many things that I will tell you to experience... Eighteen -- Nineteen -- Twenty. Deep asleep. You will not awaken until I tell you to do so. You will wish to sleep and have the experiences I shall presently describe.

You are feeling comfortable, relaxed, thinking of nothing, nothing but what I say, your eyes are closed, comfortably closed, you are thinking of nothing, nothing but what I say, your arms and legs feel heavy, your arms and legs feel heavy and you are relaxed, the muscles of your face, arms, and legs are relaxed, your whole body is relaxed. Drift deeper. It feels as though you are going backward in the darkness,

backward in the darkness, and as you go backward in the darkness you feel more and more comfortable, more and more relaxed, you are listening only to my voice, only to my voice, thinking of nothing, absolutely nothing, concentrating only on my voice, listening only to what I say, listening only to my voice, you are feeling comfortable and relaxed, comfortable and relaxed, and you are in a sound sleep -- a deep sound sleep -- fully prepared to respond to and experience what I will ask you to do.

Wake-up Procedure

Listen very carefully to what I say next. You are going to wake up in a few moments. You will feel refreshed, wide awake, and in a good mood. I will count from five to one, and with each count, you will feel yourself becoming more fully awake. When I reach one, you will be wide awake.

(After hidden observer instructions: Now you can remember everything about the hidden part of yourself and what you said when I had my hand on your shoulder.)

Five...starting to wake...Four...more and more awake...Three ...still more and more awake...Two...becoming more and more awake...One...wide awake. Open your eyes, wide awake.

Appendix 3

Regression Instructions

Choose a night last week during which you were alone and slept deeply and peacefully, with no awakenings or dreams. Which night was it? _____.

Please describe to me what you did during the half hour before you went to sleep. _____. What time did you fall asleep? _____.

Today is _____ and I will be taking you back in time to last _____ night.

You are going back in time, ... back in time, ... back in time ...

It is no longer _____ ... instead, it is now _____ night.

You are going back still further.... back further .... back to _____ and back to _____ and back further still to _____ and to _____.

Now you are back to last _____ night.

You are back to last _____night and you are lying in bed shortly before falling asleep.

Appendix 4

Noise Instructions

You are now asleep, comfortably asleep. It's 1 a.m. and you are restfully, deepfully asleep. Time is slowly passing... slowly passing. It is now 2 a.m. and you are restfully asleep, comfortably asleep, deep asleep.... Time is still passing... it is 3 a.m. and you are deepfully asleep, restfully asleep. Time is passing as you continue to sleep peacefully and restfully. It is now 4 a.m. DO YOU HEAR THE LOUD NOISES?

I want you to tell me whether you heard some loud noises, some loud noises that might sound like back-firing of a car, or door slamming, some loud noises. Listen carefully and tell me if you hear them.

(If subject answers "No") Alright, just attend carefully. Now tell me it's around ____ o'clock, tell me whether you become aware of them now.

(If subject answers "Yes") Please describe the loud noises in as much detail as possible.

Appendix 5

Hidden Observer Instructions

You know that when you are hypnotized, as you are now, you can have many experiences that lie outside of ordinary reality. During deep hypnosis, people often confuse reality with things that were only imagined. The hypnotized part of the person's mind accepts suggestions so completely that what was suggested actually seems to have been happening. For instance, the hypnotized part of you, the part of you to which I am now speaking can fail to smell or hear things that are actually there. Also, if you are given a suggestion that a cast holds your arm stiff and rigid, your arm really feels stiff, just like a real cast was on it. While the hypnotized part of you is having these experiences, you are unaware of ordinary reality. Yet, even at the same time that you are experiencing suggestions, there is some other part of your mind, a hidden part, that knows what is really going on. The hidden part of your mind is registering everything that is really happening. The hidden part can always distinguish what was suggested from what really happened. For example, the hypnotized part of you might believe that a cast is really holding your arm stiff and rigid. At the same time, however, the hidden part knows that there is no cast on your arm.

I will be able to speak to the hidden part of you, the part that knows everything that is really going on, by placing my hand on your shoulder. When I speak to this hidden part of yourself, I will place my hand on your shoulder like this

(demonstrate). While I have my hand on your shoulder, I will be in communication with this hidden part, and we can talk together; but the hypnotized part of you, the part to whom I am now speaking, will not know that you are talking to me. It will not know what you are saying, or even that you are talking to me. It will not know what you are saying, or even that you are talking. When I remove my hand from your shoulder, you will be back in the hypnotic state that you are now in, and you will not know what you said or even that you were talking to me. You will forget all about it until I say, "Now you can remember everything about the hidden part of yourself, and what you said when I had my hand on your shoulder.

Appendix 6

Imagery Instructions

Close your eyes and relax as completely as you can. Try to become deeply absorbed in creating the suggestions I will presently give to you. Make the suggestions so real for yourself that your external surroundings become nonexistent and you are only aware of the scenerio you have created. Vividly imagine every aspect of the suggestions and make an effort to project yourself into the situation so that you feel as if you are really there.

END

12-12-93

FIN