1

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

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.

**Multimethod Convergence on the Compliance Hypothesis of Hypnotic
Responding**

Arthur H. Perlini

**Ph.D. Dissertation completed in partial fulfillment of requirements
of the Doctorate of Philosophy in Psychology, Carleton University,
Ottawa, Canada.**

National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-70921-9

Canada

PERMISSION TO MICROFILM -- AUTORISATION DE MICROFILMER

Please print or type — Écrire en lettres moulées ou dactylographier

Name of Author — Nom complet de l'auteur

Arthur H. Perlini

Date of Birth — Date de naissance

December 1, 1962

Country of Birth — Lieu de naissance

Canada

Permanent Address — Résidence fixe

Department of Psychology

Carleton University

Ottawa, Canada

Title of Thesis — Titre de la thèse

Multimethod convergence on the Compliance Hypothesis of Hypnotic Responding

University — Université

Carleton University

Degree for which thesis was presented — Grade pour lequel cette thèse fut présentée

Ph. D. (Psychology)

Year this degree conferred — Année d'obtention de ce grade

1991

Name of Supervisor — Nom du directeur de thèse

Professor Nicholas P. Spanos

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE DU CANADA de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans l'autorisation écrite de l'auteur.

Date

July 4, 1991

Signature

The undersigned recommend to the
Faculty of Graduate Studies and Research
acceptance of the thesis
submitted by
Arthur Perlini, B.A., M.A.
in partial fulfillment of the requirements for
the degree of
Doctor of Philosophy

Thesis Supervisor

Chairman, Department of Psychology

External Examiner

Carleton University

June, 1991

Acknowledgements

It has been said that the process of learning is such that it is never possible for anyone to say exactly how he acquired any given body of knowledge. This dissertation is the product of many people who over the years have taught me what I have simply written down here. This manuscript, like all communications, contains both a content and spirit.

With respect to the content of this work, I would like to thank my esteemed advisor, Dr. Nicholas Spanos. He planted in me that seed of knowledge which piqued my interest in hypnosis research and then nurtured and nourished these ideas to grow and flourish. He has offered substantive criticisms and valuable suggestions of this manuscript, and encouraged and stimulated me in developing my professional ideas. He has successfully demonstrated that there is more than one way of understanding things; that the old way is not necessarily wrong, but that there may be a better way. I also want to thank my committee members: Bill Jones, Bob Hoge, Bill Walther, Connie Kristiansen, Anne Laubstein, and Richard St. Jean. Their questions and comments were especially useful in clarifying my thinking about the ideas presented in this manuscript.

The spirit of this manuscript I owe to my friends and family. To my close friends, Ward Pudney, Peter McBride, Dan Egarhos, Jacqui Kellough, Rochelle Cantor, Laura Rees, Bruno Zumbo, and Elliot Loh, who all listened patiently to me and provided the love, support, and inspiration which sustained me through this project, I thank you. And finally my greatest single debt is to my family: Anna, Sandra, Mom, Dad, and Nonna. They provided not only love and support, but taught me the value of hard work, sacrifice and knowledge. Although they never blamed me for my failures, they were absolutely merciless toward a lack of effort. With love and gratitude, I dedicate this effort to you.

Abstract

Using a cross-paradigm analysis, the present study sought to examine the extent to which hypnotic responses reflected behavioural compliance rather than genuine changes in subjective experience. Of particular interest was the variability in trance logic responses traditionally shown by high hypnotizable hypnotic subjects. In session 1, real and simulating subjects underwent hypnotic suggestions for pseudomemory, age regression, and visual hallucination. In a second session, subjects were exposed to three separate trials of an auditory tone, under baseline, hypnotic deafness, and compliance-inducing instructions. High and low simulators performed equivalently on all suggestions; however, these two groups differed from reals on pseudomemory responding, transparency of hallucination and duality during age regression. Both pseudomemory and trance logic responses were poor predictors of compliance-induced sound changes. Moreover trait measures of conformity, social desirability, imagery involvement and vividness were poor predictors of compliance. On the other hand, incompleteness indices did predict response to the compliance instruction. Subjects who showed pseudomemory or failed to show trance logic reported more intense subjective experiences than those did not show this pattern of responses. These findings support the differential demands hypothesis and fail to confirm Orne's logical incongruity hypothesis. The findings indicate that compliance strongly influences the reports of hypnotic subjects. This is consistent with the social psychological view rather than the special process view of hypnotic responding.

Table of Contents

Acknowledgements	2
Abstract	3
Introduction	9
History of Methods	9
Mesmer and the Royal Commissions	10
Changes in Methods and Hypnotic Behaviour	12
Clark Hull and Empirical Methods	13
Compliance	15
Definitions	15
Accuracy of Verbal Reports	18
Motives for Compliance	20
Demand Characteristics and Hypnosis	21
Antisocial and Objectionable Behaviour	23
Pseudomemory	25
Self-Perceptions and Individual Differences	29
Autohypnosis, Compliance, and Impression Management	30
Compliance in Clinical Populations	33
Verbal Indices of Experience	33
Physiological Indices of Pain Experiences	36
Physiological Indices of Deception	38
Hypnotic Deafness: A Paradigm Case	40
Contemporary Behavioural Methods for Compliance	46
Barber's Task-Motivational Paradigm	46
Honesty Demands and Compliance	51
Orne's Real-Simulator Paradigm	57
Reliability	61

Validity	63
Adequacy of Simulators as Controls	63
Other Indices of Incongruous Responses	65
Spanos et al. Compliance Paradigm	69
Methodological Convergence	77
Present Study	
Experimental Hypothesis	80
Method	82
Subjects	82
Measures	82
CURSS	82
Subjective Experience Ratings Scales	84
Personality Questionnaires	85
Auditory Stimulus	86
Visual Stimulus	86
Procedure	87
Real and Simulating Conditions	87
Session 1	89
Session 2	91
Experimental Tests	93
Pseudomemory	93
Age Regression	95
Visual Hallucination	96
Incompleteness ratings of Subjects' Protocols	98
Results	99
Passing Suggestions	99
Pseudomemory	102
Logical Incongruity	108
High vs Low Simulators	108
Reals vs Simulators	108

Construct Validity	111
Subjective Experience and Logical Incongruity	111
Reals versus simulators	111
Correlational Analyses	114
Incomplete Responding	117
Reals versus simulators	117
Incompleteness and trance Logic	121
Incompleteness and subjective experience	121
Compliance	124
Trance Logic and Compliance	124
Subjective Experience and Compliance	133
Incompleteness and Compliance	133
Individual Differences, trance logic and compliance	139
Discussion	145
References	162
Appendix 1	Simulating Instructions
Appendix 2	Informed Consent: Experiment 1
Appendix 3	Hypnotic Induction
Appendix 4	Hypnotic Suggestions & Experiential Analysis Technique
Appendix 5	Wake-Up Procedure
Appendix 6	Pseudomemory Post-Experiential Analysis Questions
Appendix 7	Age-Regression Post-Experiential Analysis Questions
Appendix 8	Hallucination Post-Experiential Analysis Questions
Appendix 9	Instructions for Category Rating Procedure
Appendix 10	Informed Consent: Experiment 2
Appendix 11	Deafness Suggestion: Experiment 2
Appendix 12	Compliance Instruction
Appendix 13	Cognitive Activity Assessment (Rating Scale)
Appendix 14	ABS subscale of DPQ
Appendix 15	Concern for Social Appropriateness Scale
Appendix 16	Crowne-Marlowe Scale of Social Desirability
Appendix 17	Vividness of Mental Imagery Scale
Appendix 18	Debriefing Procedure

List of Tables

1. Means and standard deviations for the total number of suggestions passed per group.
2. Number of subjects per group passing each suggestion.
3. Mean rating on subjective experience questionnaire for real hypnotic subjects on pseudomemory.
4. Mean rating on Subjective Experience Questionnaire for real hypnotic subjects reporting memories exactly as suggested versus distinctive sounds.
5. Mean rating on trait measures for real hypnotic subjects on pseudomemory.
6. Comparison of high and low susceptible simulators per incongruity response-item.
7. Comparison of reals and simulators for each logical incongruity response item.
8. Intercorrelations for logical incongruity items
9. Mean rating on subjective scales for high and low simulating subjects.
10. Mean rating on subjective scales for real and simulating subjects.
11. Intercorrelations for logical incongruity items and associated subjective experiences questionnaires.
12. Mean rating of subjective experience questionnaire for real hypnotic subjects passing versus failing each logical incongruity item.
13. Mean rating on incompleteness for high and low simulating subjects.
14. Mean rating on incompleteness for real and simulating subjects.
15. Intercorrelations for logical incongruity items items and incompleteness indices.

16. Intercorrelations for Subjective Experience and Incompleteness Indices
17. Summary table for 2 X 2 X 3 ANOVA on Raw Scores
18. Mean sound intensity ratings across trials for each group.
19. Mean sound intensity ratings across trials for each condition
20. Summary table of 2 (Pseudomemory: Yes/No) X 2 (Trials) ANOVA on percent change scores.
21. Summary table of 2 (Sentence Errors: Yes/No) X 2 (Trials) ANOVA on percent change scores.
22. Summary table of 2 (Duality: Yes/No) X 2 (Trials) ANOVA on percent change scores.
23. Summary table of 2 (Transparency: Yes/No) X 2 (Trials) ANOVA on percent change scores.
24. Number of real hypnotic subjects in the compliance group who complied versus did not comply, by response index.
25. Intercorrelations for Subjective Experience and Trial 3 Sound Change
26. Regression analysis of incompleteness and subjective experience indices on trial 3 sound change for real hypnotic subjects given the compliance instruction.
27. Regression analysis of logical incongruity indices on trial 3 sound change for real hypnotic subjects given the compliance instruction.
28. Mean rating on trait measures for real hypnotic subjects on sentence errors.
29. Mean rating on trait measures for real hypnotic subjects on Duality.
30. Mean rating on trait measures for real hypnotic subjects on Transparency.
31. Intercorrelations for individual difference measures and trial 3 change scores

List of Figures

- 1. Percentage of reals and simulators passing the pseudomemory suggestion**
- 2. Experience ratings of pseudomemory responders versus nonresponders**
- 3. Sound change of pseudomemory responders versus nonresponders**
- 4. Percentage of reals and simulators showing each trance logic response**
- 5. Trial 3 change of compliance versus control subjects**
- 6. Sound change of subjects making sentence errors versus those who did not**
- 7. Sound change of duality responders versus nonresponders**
- 8. Sound change of transparency responders versus nonresponders**
- 9. Percentage of variance in trial 3 sound change accounted for by incompleteness and subjective experience indices**
- 10. Percentage of variance in trial 3 sound change accounted for by trance logic indices**

Introduction

Historically, profound changes in subjective experience have been regarded as a defining feature of hypnosis (Sarbin, 1962). Nevertheless it is very difficult to document valid changes in subjective experience because hypnotic behaviours are easy to fake and the hypnotic situation is one which creates strong demands for the production of "appropriate" overt responses to suggestions (Spanos, 1986a). Hypnotic behaviour is regarded as stemming from faking or compliance if it is discrepant with the experience of the subject. Compliance responding has been neglected in that it has been treated as an artifact rather than a potentially important component of hypnotic responding (Spanos, 1989). The purpose of the present research is to examine the extent to which hypnotic responses reflect behavioural compliance rather than genuine changes in subjective experience.

Efforts to establish means of evaluating the "genuineness" of hypnotic responding has a long history. For the last two hundred years these efforts have been aimed at isolating a "genuine" or noncompliant component to hypnotic responding.

History of Methods

The history of hypnosis is replete with examples of purported supernatural and amazing feats. Under the influence of hypnosis the most ordinary person is supposedly invested with powers verging on the supernuman: improved strength, memory, visual and auditory acuity, insensitivity to pain, clairvoyance, etc. (Wagstaff, 1981). It has long been recognized that if the phenomena of hypnosis were to be legitimately established then some means of excluding deceit and deception clearly had to be devised (Sheehan & Perry, 1976). A brief look at the methods used to establish the nature or "reality" of the

phenomena will place in perspective any effort to isolate the degree of compliance in hypnotic responding.

Mesmer and the Royal Commissions

The historical roots of hypnosis lie in France during the 18th century. Franz Anton Mesmer, trained as a physician in Vienna, sought unorthodox means of treating physical illnesses. The prevailing social climate was consistent with Mesmer's view that disease reflected an imbalance in the distribution of magnetic fluid within the body. Mesmer believed he had the ability to harness the magnetic fluid that permeated the universe, to concentrate it in his person and to transfer it to another person, and thus rid the patient of his or her ills. The evocation took the form of "crises," which were variously described as vomiting, expectoration, sweating, evacuation and various convulsive behaviours (Darnton, 1968). In 1778 Mesmer took his practice and doctrines to Paris, where he received popular but not scientific favour. In 1784, the King of France appointed two independent commissions of inquiry into animal magnetism: the Academie des Sciences and the Societe Royale de Medecine. These events are significant insofar as they marked the first application of the scientific method to hypnosis (Sheehan & Perry, 1976). The purpose of the commissions was to "inquire into the possibility of the existence and utility of animal magnetism" [Benjamin Franklin et al., 1785, p. 89]. Although the methods used by these commissions were largely naturalistic observations under poorly controlled conditions, a series of single-subject studies, conducted in a blind fashion, were ultimately considered to be the decisive evidence used to refute the existence of animal magnetism. The alternative explanation for these phenomena emphasized irritation and faith, which the commissioners saw as a product of imagination. Despite these reports, the defense of the mesmeric doctrine was spirited, with numerous anecdotal accounts serving as testimony to its "reality."

The ontological status of hypnosis came under attack when the medical community learned that some of the female hysterical patients who were the subjects of many of the experiments being conducted at the time, admitted to outright deception (Sheehan & Perry, 1976). Accordingly, two commissions were established by the Academie de Medecine in Paris. In the first of these reports, produced in 1831 but never published, a series of uncontrolled single subject studies led the commissioners to support the existence of animal magnetic forces. The second report published in 1837 was slightly more methodologically sophisticated (e.g., used blindfolds to investigate visionless sight) and lent no support to the theory of animal magnetism. One of the principal issues of contention was whether hypnotic behaviour could be influenced by nonverbal cues in the situation. Poor methods to test this hypothesis led to the denouncement of hypnotic practices, and to the conclusion that deliberate fraud was being practiced by patients and practitioners of these techniques, a view which received support from certain patients who admitted to such. Also noteworthy is that the earlier explanatory notion of "imagination" proposed by the earlier commission in 1785 was reformulated by the 1837 commissioners as being synonymous with "not real," and thus fraudulent (Sheehan & Perry, 1976). Hence began the debate known as "fluid versus fraud" (Podomore, 1909).

Changes in Methods and Hypnotic Behaviour.

Theories of hypnosis began to divide into three conceptualizations: supernatural forces, imagination, and fraud. The methods of practicing mesmerism also underwent change (Sarbin & Coe, 1972; Waxman, 1986), with verbal and nonverbal suggestions replacing the ritualistic "passes" of Mesmer. Mesmer used a combination of the ancient procedure of laying on of hands with a disguised version of medieval demonic exorcism. Others like de Puyseur, a student of Mesmer, dispensed with the mystic ceremonials and somber surroundings. He also found that convulsive crises were not integral to the success of treatment. This change provided a starting point for the observation that variations in induction procedure led to corresponding alterations in the hypnotized person's behaviour.

Around 1814 a Portuguese priest named Jose diFaria developed induction procedures which predate those of today; that is, those involving relaxation, drowsiness and sleep suggestions, as well as experimental designs comparing subjects of high and low susceptibility to hypnosis (Shor, 1979). In 1847, a Scottish surgeon named Braid adopted similar methods including induction procedures which emphasized a concentrated attention on a bright light which served to induce a state of hyperattention or "monoideism." It was Braid who later coined the term "hypnosis," and eventually came to emphasize notions of belief, expectancy, and attention as integral components to the effectiveness of hypnotic procedures.

Braid's work was extended in 1884 by his French contemporaries at the Nancy school, namely Liebeault and Bernheim. These investigators are credited with the consideration of hypnosis as a form of behaviour continuous with normal waking behaviour and a function of suggestion and social influence. These notions have

been adopted and refined by current thinkers into the concepts of role taking (Sarbin & Coe, 1972).

Other theorists were less concerned with the long-standing imputation of fraud and self-deception to hypnotic behaviour. The French neurologist Jean-Martin Charcot (1835-1893) believed that hypnotized persons were in some sense unconscious, leading Charcot to freely discuss his doctrines in their presence, unaware of how this alone would have helped to elicit hypnotic behaviour consistent with his theories (Sheehan & Perry, 1976, p. 37). Using epileptics and patients suffering from hysterical conversion reactions, Charcot sought to equate hysterical conditions with hypnotic manifestations, forgetting that hysterics often possess extraordinary abilities to mimic the symptoms of organic conditions. Furthermore many of the patients, unbeknownst to Charcot, were surreptitiously being cued by his assistants as to what behaviours were expected during the hypnotic demonstrations (Ellenberger, 1970). These demonstrations often relied on unsystematic observations and single-case, no control designs. Despite this, Charcot's theory was enthusiastically received by the Academie des Sciences in 1882, bringing scientific credibility back to hypnosis 98 years after the Benjamin Franklin Commission discredited it.

Clark Hull and Empirical Methods

In the late 1920's, with the onslaught of the behaviourist movement, Clark L. Hull set out to design controlled experiments to evaluate the ontological status of hypnosis. Unlike earlier researchers, he used: (1) "normal" subjects rather than hysterical patients, (2) un hypnotized control subjects rather than no controls, and (3) the Null Hypothesis probability model to enhance the confidence in his conclusions (Sarbin & Coe, 1972; Shor, 1979). Despite these improvements in methods, his laboratory procedures centered upon simple motor responses and memory functions,

ignoring the complex affective, interpersonal and motivational determinants of hypnotic responding (Sarbin & Coe, 1972; Sheehan & Perry, 1976). His methods may have limited his discoveries. For example, he rejected any method that resembled introspection or self-report data. Although many contemporary researchers would concur with Hull against the validity of self-report data (e.g., Nisbett & Wilson, 1977), it is still useful to determine under what conditions such reports are valid or invalid.

Hull initiated contemporary experimental research in hypnosis; he also was the first to consider it as an interpersonal or social psychological phenomenon. These developments influenced theorists like White (1941) and Sarbin (1950) who, although not known for their experimental developments, did contribute an integral component to all current theories of hypnosis: namely, the social nature of the hypnotic setting and the active nature of the hypnotized subject.

White (1941) described hypnotic behaviour as "goal directed striving, its most general goal being to behave like an hypnotized person as this is continuously defined by the operator and understood by the subject" (p. 503). Sarbin (1950), although adopting a similar position, cogently pointed out that White's theory failed to recognize subjects' preconceptions of the experiment(or) and self-perceptions. Sarbin's theory emphasized how role taking was defined by cues in the experimental setting. Thus he extended White's theory to include those variables which lead to successful goal-directed strivings in hypnotic situations; that is, favourable motivation, role perception, and role-taking aptitude. The construct "role," like that of "imagination" invoked by the Benjamin Franklin Commission 100 years earlier, has been widely misunderstood as meaning "not real" or "sham" behaviour.

For over 200 years, the practice of hypnosis has not been able to escape either intended or unintended accounts of its nature in

terms of faking, deception, and deceit. In fact it seems that accounts in terms of deception and faking are far more enduring than any other single account stressing an "essence" or assigning a "reality" status to hypnosis (e.g., magnetic fluids, neurological pathology, dissociation).

Compliance

Definitions

The notion of deception implies the withholding of certain information or the presentation of false information (Ekman, 1981). The truth or falsity of this information is assumed known by the person doing the deceiving, but not by the person observing or receiving the overt communication. The information might be considered cognitive, affective, or experiential. If we include under the rubric of deception those we might call "lies of self-presentation," like attempts to present ourselves as a little more kind, a little more sensitive, a little more intelligent, and a little more altruistic than in fact we really are, then it is likely that the phenomenon of deception is quite pervasive (DePaulo, 1981).

The managing of a person's overt or public behaviour can be said to be both rule and role governed, and serves to: (a) control the outcome of an interaction, (b) secure a positive evaluation from others, (c) preserve one's self-image, and (d) control the interpretations others give their actions (Goffman, 1959). Deceptive practices, although connoting negative behaviours, can often be socially appropriate behaviour; for example, conveying an impression of sorrowful respect at the funeral of a disliked department head despite one's private loathing for the deceased (Spanos, 1986a).

Social psychologists (e.g., Aronson, 1977; Kiesler & Kiesler, 1970) have employed the term *compliance* in much the same way as

the term "deception" was described above; that is, outward behaviour which conforms to the wishes or expectations of others but conflicts with the private convictions of the actor. The private convictions may include an attitude, belief, or opinion, all of which could be generally subsumed as private experiences. In short, instances in which one's private experience is discrepant with one's public behaviour might be regarded as compliant behaviour.

Since its inception, the unusual behaviours associated with hypnosis (e.g., apparent inability to bend the arm following suggestions for arm rigidity) have been conceptualized as reflecting concordant experiential changes (e.g., the experience that the arm really won't bend). Related to the notion of experiential change, the hypnotized subject is assumed by some to be responding in an automatic or involuntary fashion. Hypnotic behaviour is seen as something that "happens" to subjects rather than something subjects are "doing" (Weitzenhoffer, 1953). In this light, an act carried out volitionally in a hypnotic setting would not be genuine, but rather one regarded as compliance (Orne, 1966). The notions of experiential change and the nonvolitional nature of hypnotic responding have long served as hallmarks and unique features of hypnosis. In fact, involuntariness is considered a unique aspect of the hypnotic experience (Bowers, 1981; White, 1941).

In light of our understanding of compliance and the essential or genuine features of hypnotic responding, it appears necessary to state what defines compliance in the hypnotic situation. Wagstaff (1981) has succinctly outlined two categories of hypnotic response which qualify as compliance:

- (1) Where a volitional [overt] act is supposed to reflect an underlying subjective experience but this is not the case, for example, in response to a pain stimulus the subject *says* he is not feeling pain, when privately he

feels pain, or he moves his hand as if brushing away a fly, but does not subjectively experience an hallucinated fly at all.

(2) Where an act explicitly or implicitly is supposed to be performed nonvolitionally, but the subject consciously decides to perform the act. For example, he deliberately raises his hand in response to an arm levitation suggestion without feeling that the arm 'rises by itself' (p.21).

The preceding description of compliance in hypnotic settings uses experiential change and nonvolition as standards to determine the genuineness of overt behaviour. It tacitly assumes that people are able to accurately classify and describe their subjective experiences and know when they are behaving without a conscious decision to carry out a behaviour. Some theorists have argued that these assumptions may be faulty.

Accuracy of Verbal Reports

Jones and Nisbett (1972) have enumerated a list of types of privately held knowledge that people do indeed have direct access to. They have argued that the individual knows a host of personal historical facts, the focus of their attention at any given point in time, their current sensations, and generally this knowledge is at least superior to that of any observer. In short, individuals have privileged access to the content but not the process by which their experiences are classified (Nisbett & Wilson, 1977). The process by which individuals come to know their experiences, or simply "how" they label their experiences, has been argued to be no more accurate than that of observers of that experience. Nisbett and Wilson (1977) have buttressed their argument on the basis of Bem's (1972) self-perception attribution theory and related empirical support for the theory. Simply stated, the theory holds that under certain conditions

subjective experiences are not unique or distinctive, but rather ambiguous. Consequently, when experience is ambiguous, individuals must label their experiences on the basis of their own behaviour and the context in which it occurs, rather than from any distinctive internal cues. These notions have been adopted by Radtke and Spanos (1981) to describe how hypnotic subjects come to label their hypnotic experiences. Important to this view is that the subjective experiences during hypnosis are not unique because of any distinctive changes in the internal condition of the subject, but rather because the situational demands and expectations are unique.

The second condition of genuine, in contrast to compliant, hypnotic responding involves the subject's avowal that he/she is not the author of certain of his/her actions. This condition requires that subjects have direct knowledge as to whether their acts are performed intentionally or "just happen." Consequently when hypnotic subjects are asked to render a phenomenological report about the source of their actions one tacitly assumes that these subjects know when and why they behaved in a certain manner. As noted above, subjects may be grossly inaccurate in describing the "process" by which their behaviours come about. This includes its volitional or nonvolitional quality. This faulty assumption also ignores, ironically, that individuals might not only deceive others but also themselves.

Reports of nonvolition in hypnotic contexts have been construed by some (e.g., Sarbin, 1981; 1984) as reflective of self-deception. Specifically, some hypnotic subjects may convince themselves, and appear genuinely to believe, that they are not the agent of their own actions. The means by which they purportedly do this is by "not spelling out" certain features of personal experience that would challenge the plausibility, credibility, and coherence of their verbal reports. Others (e.g., Hilgard, 1977) have argued that subjects can accurately report on the volitional quality of their

actions, invoking concepts such as divided consciousness to account for the apparent discrepancy between volitional and nonvolitional actions of hypnotic subjects.

The preceding discussion sought to illuminate the features of compliance in hypnotic settings as well as evaluate the tenability of the standard used to measure it; namely, the accuracy of private knowledge of experience and intention. In examining the issue of compliance in hypnotic settings, some researchers (e.g., Barber, Spanos, & Chaves, 1974; Wagstaff, 1981; 1986) have found it fruitful to invoke an auxiliary concept; namely, beliefs. Essentially, to believe in something is to accept it as true. When there is consistency between these beliefs and behaviour, regardless of whether these beliefs are accurate, a person is **not** complying. Compliance, then, is not a quality of behaviour, but an attribution one makes about the causes of his or her behaviour. In this vein, the shaman's belief that his bizarre behaviour is the result of spiritual possession does not make him a liar (Spanos, 1986b); nor are hypnotized subjects who genuinely believe that their behaviour is brought about by the hypnotic procedures. In short, each of these persons is mistaken not dishonest. On the other hand, if the shaman does not believe his behaviour is the result of spiritual possession but does behave in a manner which would lead others to believe that it is, then the shaman is complying. Genuine hypnotic responding, then, is not only defined by experiential and volitional changes, but also by subjective beliefs that a change has occurred when there was no change. Most present day theorists regard compliant hypnotic behaviour as that which excludes those behaviours which reflect changes in one's private beliefs or convictions. The latter behaviours are considered *conformity*, rather than *compliance*.

Motives for Compliance

Given our current understanding of compliance, it seems worthwhile to understand the reasons why people would comply, or misrepresent their private experience. The answer to this question was alluded to in the earlier discussion on deception, where the motives included such things as securing positive evaluations from others and one's self, as well as preserving control of the outcome of an interaction or the interpretations others have of one's actions.

Much social psychological research in the 1960's was aimed at elucidating those variables which contribute to compliant responding in the psychological experiment. These variables were conceptualized in terms of the motives that subjects assumed in experimental settings. These include: (1) the good subject (Orne, 1959) who attempts to give responses which will validate the experimental hypothesis, (2) the faithful subject (Fillenbaum, 1966) who follows and responds to all instructions without regard to the experimental hypothesis, (3) the apprehensive subject (Rosenberg, 1969) who is concerned with how the experimenter will evaluate him/her personally, (4) the negativistic subject (Cook, Bean, Calder, Frey, Krovetz, & Reisman, 1970) who attempts to sabotage the experiment or disconfirm the experimental hypothesis. Of all these conceptualizations of subjects, those of Orne (1959; 1962) have had the most impact for methods and theories of hypnosis.

Demand Characteristics and Hypnosis

Orne's (1959; 1962) notion of the "good subject" involves high motivation level, as well as an increased acuity for cues which guide the subject's behaviour to conform to the experimenter's expectations, and thus to validate the experimenter's hypothesis. Orne (1969) called these cues *demand characteristics*, a concept which includes the sum total of cues available to the subject before the experiment, the instructions during the experiment, the covert

communications during the experiment, and those aspects of the procedure itself that communicate the experimental purposes and the desired behaviour. Orne (1981) also stated that it is not possible to design an experiment [for humans] without demand characteristics, and that these demand characteristics are by no means limited to the laboratory experiment (e.g., naturalistic field studies, therapeutic, clinical and forensic contexts, etc.).

The ubiquitous nature of demand characteristics in experimental settings provides a basis for understanding that experimental subjects are active, sentient, cognizing persons whose perceptions, attitudes, and expectancies may integrally affect the nature of experimental outcomes (Orne, 1962; Sarbin & Coe, 1972; Sheehan & Perry, 1976; Spanos, 1986a). Note that the pervasiveness of these demand characteristics does not imply that they always lead to compliant or disingenuous behaviour. Psychological experiments are normatively regulated situations which usually contain implicit norms for honest reporting (Spanos, 1986b). Generally, it is reasonable to suppose that indices of experience (e.g., subjective reports and overt behaviour) in these contexts are more accurate than those in contexts with less salient norms for honest reporting. On the other hand, much empirical research on the effects of social pressure reveals that subjects can be induced to make grossly erroneous statements (Asch, 1951; 1952; Crutchfield, 1955) or commit severe social improprieties (Milgram, 1964) within experimental settings. This research has shown that pressures to comply can alter far less ambiguous experiences and beliefs than those in an hypnotic situation. Both Frank (1944) and Orne (1962) have shown that subjects will obey instructions that are patently ridiculous as long as the context within which their actions are performed legitimizes their behaviour.

Antisocial and objectionable behaviour in hypnosis

The findings and conclusions of Milgram (1964) deserve notice for research into compliant hypnotic responding. Milgram argued that the hierarchical nature of the experimenter-subject relationship absolves subjects of responsibilities for their actions and instead defines subjects as instruments for carrying out the wishes of the experimenter. This caricature bears a similarity to that noted of hypnotic subjects and thus might be adaptable to the hypnotic situation, given the belief that hypnotic responding is involuntary and the general cultural belief in the coercive powers of hypnosis.

Several studies have attempted to induce hypnotic subjects to commit antisocial acts. Positive responses can be considered compliant only if one assumes that the acts contradict the private principles and beliefs of the subject, for example, that one believes that harming another person is socially or morally unacceptable. Even before Milgram's (1964) landmark experiment, Young (1948) showed that subjects in hypnosis, but not waking conditions, could be induced to throw nitric acid at an assistant or pick up a poisonous snake. Other research by Orne and Evans (1965) found both hypnotic and waking simulating subjects carried out these same acts; however, the subjects admitted that they tacitly understood that precautions were taken by the experimenter to eliminate the possibility of injury.

Attempts have been made to disguise the fact that subjects were participating in an experiment by administering hypnotic inducements to commit the antisocial act outside the laboratory. For example, Coe, Kobayashi and Howard (1972) found hypnotic but not nonhypnotic subjects were willing to steal an important exam from the departmental office; on the other hand, hypnotic procedures

made no difference to whether subjects could be induced to sell heroin (Coe, Kobayashi & Howard, 1973).

Other researchers have obtained similar findings using objectionable but not antisocial acts. For example, Calverley and Barber (1965) found hypnotic induction made no difference to whether nursing students could be induced to sign derogatory-slandorous statements about their supervisor, and almost all did so regardless of whether they believed harm would be done to the supervisor. Others (e.g., Levitt, Arnoff, Duane, Toner, and Parrish, 1975) reported a substantial degrees of compliance amongst subjects instructed to cut up the American flag or mutilate the Bible, though the rates did not differ between hypnotized individuals and simulators. In short, research into the degree of compliance induced to commit antisocial or objectionable acts does not support the cultural belief that hypnosis has coercive properties beyond those of other experimental conditions. Unfortunately, the cultural belief continues to be propagated by those who commit illegal acts offering the defense that one was powerless or not responsible because they were hypnotized (Laurence & Perry, 1989).

It is important to note that compliance in experimental settings is moderated by more than simply efforts to validate a hypothesis or pressures to obey an authority, or report honestly. Rosenberg's (1969) suggestion that response to demands be in accordance with one's self-perception is now considered an integral component of the role of a "good" subject (Orne, 1969). On the surface, it appears that this notion fails to reconcile the findings above, unless we assume that subjects would like to consider themselves as thieves, heroin-dealers, committers of treason, or generally sadistic people. However in all the studies on antisocial acts subjects committed the acts with the tacit, and later explicit, understanding that precautions were being taken by the experimenter to eliminate harm and injury. Consequently, a subject could still carry out the objectionable and

antisocial acts, while preserving their self-perception as a good person. It appears then, that the decision to comply is dependent upon the subject's ability to resolve the conflict of validating the hypothesis and maintaining a favourable self-perception.

There is research which suggests that sometimes the preservation of a favourable self-perception is a superior consideration. For example, Barber and Calverley (1964a; 1964b) found that when the hypnotic situation is defined as a test of gullibility, subjects were far less responsive than when it was defined as a test of imagination. Similarly, Hunt (1979) found that when a hypnotic situation was defined as "ridiculous" by the presence of a recalcitrant subject, other subjects were less likely to respond to hypnotic suggestions. In short, noncompliant responding does occur in experimental, including hypnotic settings, and appears to depend on the weight subjects assign to both internal and external pressures.

Pseudomemory

In recent years, it has been suggested that hypnosis can improve the recall of otherwise irretrievable memories. This suggestion has seen application in forensic contexts where eyewitnesses to crimes have had their memories "refreshed" by the use of hypnotic interrogation procedures. Specifically, witnesses are asked to "relive" the situation in question with the purpose of recalling events that were previously not recalled. Initially, this appeared to be of great benefit in light of the fact that eyewitness testimony is often inaccurate (Loftus, 1979).

There are hundreds of anecdotal case studies which indicate that otherwise unsolvable cases were miraculously solved through the elicitation of new information from hypnotized witnesses (Smith, 1983). Laboratory research on human memory, however, suggests

that memory is constructive; both external information (e.g., subtle contextual cues and suggestions) and one's own thoughts interact and can change an existing memory trace. For example, Hilgard and Loftus (1979) suggested that interrogation procedures not only elicit information from a witness but also supply information to the witness, producing an alteration of memory. Cues in the form of leading questions can interact with individual difference variables like suggestibility or influenceability to produce memories for events that did not really happen. The danger, of course, is that the memories elicited may be artificially-produced or *pseudomemories*, rather than original memories.

It has been suggested (e.g., Orne, 1979) that witnesses with whom hypnosis is used to elicit such memories may be incapable of distinguishing the original and created memories. The consequences of such a situation are obviously very serious (e.g., mistaken identifications, false accusations and punishments). Furthermore, it has been suggested that hypnotically-induced pseudomemories may be held with high levels of confidence. High confidence on the part of witnesses can make these pseudomemories more credible to jurors (Wells, Lindsay & Ferguson, 1979) and less vulnerable to cross-examination in courts of law (McCann & Sheehan, 1985-1986). Evidence that suggestions produce such effects in hypnotic subjects is equivocal, with some studies reporting greater confidence in incorrect recall for hypnotic subjects than for controls (Sheehan & Tilden, 1983) and others (e.g., Gregg & Mingay, 1987; Mingay, 1986; Putnam, 1979) finding no difference in confidence.

One difficulty in the legal use of hypnosis is determining whether the events recalled during hypnosis indeed occurred. Often times the criterion is never known (i.e., it is not publicly verifiable). Laboratory research, however, can be of assistance here because researchers have control over the nature of the events witnessed. For example, Orne (1979) suggested that one first establish the

events of a particular night. Subjects are then hypnotically age-regressed and instructed to "re-live" the night they had just described. Then it is suggested to subjects, while hypnotized, that they awoke and heard, for example, two loud noises. Later the memory is tested out of hypnosis and subjects are asked to report while awake whether they actually heard the loud noises on the night in question. Laurence and Perry (1983) modelled this procedure and found that 48% of highly hypnotizable subjects reported that the suggested noises had occurred, despite that fact that they had not previously mentioned them. This finding was replicated by Labelle, Laurence, Nadon, and Perry (1990), who found that 46% of highly and moderately-highly susceptible subjects believed that the pseudomemory was veridical. Spanos and McLean found 33% of their highly susceptible subjects reported pseudomemories. Taken together, the research evidence indicates that pseudomemory is a reliable phenomenon across studies.

Despite some consistency in rates of pseudomemory, contemporary researchers are divided on their interpretation of these findings. Some researchers (e.g., Laurence & Perry, 1983) have argued that these findings suggest that hypnotic suggestions can actually change memories and create firmly held beliefs in the occurrence of the suggested events. From this perspective, subjects are incapable of differentiating between their memories of the night in question and the suggested noises. An alternative account of Spanos and McLean (1986) does not regard the findings as indicating created memories, but rather experimentally created reporting-biases or compliance. According to this hypothesis, hypnotic situations create strong demands for situationally-appropriate behaviour. Pseudomemory suggestions cue subjects about what is expected from them. Those subjects who comply with this invitation maintain this performance posthypnotically so as not to discredit their earlier hypnotic testimony. This does not imply that subjects

are necessarily lying about hearing the noises. They may indeed have interpreted the auditory suggestion as a request to imagine the suggested noises. However, according to this hypothesis, subjects remain capable of distinguishing these imaginings from their actual memories. They will do so when such behaviours do not discredit their earlier hypnotic testimony (Spanos & McLean, 1985-1986). In short, this hypothesis states that suggestion-induced memory distortions do not occur with hypnotic interrogation procedures; rather the actual or original memories remain intact and the testimony based on those memories are experimental creations based on cues provided to the subject.

Several recent studies (e.g., Spanos & McLean, 1985-1986; Spanos, Gwynn, Comer, Baltruweit and deGroh, 1989) using different paradigms provided data which indicate that pseudomemory effects are substantially influenced by reporting bias. Nevertheless, the extent to which bias-effects influence memory reporting remains controversial. Also controversial is the issue of whether hypnotic and nonhypnotic procedures differ on their tendencies to influence memory on the one hand and elicit biased reporting on the other.

Self-Perceptions and Individual Differences in Compliance

The issue of self-perceptions bears on an issue which has received extensive attention by researchers in hypnosis; namely, whether subjects who are responsive to hypnotic procedures feel a need to perceive themselves and be perceived by others as behaving in socially acceptable ways. This has prompted a number of researchers to seek a link between hypnotic susceptibility and constructs such as *need for social approval, honesty, cooperativeness and willingness to please*. One might predict that individuals scoring high on the "honesty" construct would be less likely to comply in an hypnotic context than individuals who are high on "need for social

approval" or "cooperativeness." "Cooperative" individuals might be expected to respond to suggestions despite a failure to experience them as involuntary or subjectively compelling.

Early research in this area was reviewed by Barber (1964a) who concluded that there were no consistent relationships between any of the aforementioned personality variables and hypnotizability. More recent research is equivocal in its findings. No relationships were found between hypnotizability and social desirability or acquiescence (Moore, 1964; Spanos, Perlini, Patrick, Bell, & Gwynn, 1990; Spanos, Burgess, & Perlini, 1990). On the other hand, Shames (1981) did find hypnotizability to correlate with degree of compliance in the Asch Paradigm. Independent measures of compliance have also been used to assess relationships with hypnotizability. Orne (1966) found that hypnotizability played no role in subjects' compliance with an experimenter's request to return a stack of postcards back to the experimenter; on the other hand, hypnotizability was able to predict compliance to demands for alumni annual giving (Graham & Greene, 1981). Despite these few positive findings, behaviour in hypnotic settings cannot be entirely accounted for by the need to perceive oneself and be perceived by others in a socially desirable light. It seems reasonable to propose that situational cues encountered in the hypnotic setting do play a role in the degree of compliant responding.

To buttress or defend the authenticity of hypnotic responding, a number of investigators have argued that auto-or-self hypnosis and clinical case studies attest to the noncompliant nature of hypnotic responding. After all, in the absence of another, there is no role of a "good" subject; or alternatively, patients experiencing pain or psychological trauma are not likely to be motivated to minimize their distress simply to please the experimenter/physician in the absence of subjective changes in experience (e.g., pain).

Autohypnosis, Compliance, and Impression Management

The idea that individuals would "fake" experiential changes in the absence of an audience to fool, like the clinical pain situation, appears to be far fetched. However there are often pressures for individuals practising self-hypnosis to report they were successful to another, for example, the hypnotist (or physician in clinical situations) who instructed them to practise such procedures. This bears on the issue of whether it is an audience that motivates compliance in hypnotic settings.

Several studies have sought to test the hypothesis that audiences alter compliance in hypnotic settings. The methods essentially involve manipulating the salience to subjects that they are being observed. One approach employed by Coe (1966) was to either tell or not tell hypnotized subjects that their behaviour was being observed (behind a one-way mirror) by five clinical psychology graduate students. The "audience" subjects showed significantly reduced responsiveness compared to their matched subjects in the "no audience" condition. In other words, observations made salient led to decreased responsiveness.

A second strategy to test the effect of observation on compliant hypnotic responding is the "disappearing hypnotist" strategy. The assumption here is that if hypnotic subjects are simply complying (i.e., faking) then when the hypnotist leaves the room subjects should stop faking (after all, there is no one to fake to!). Dorcus, Brintall and Case (1941) found that subjects administered a relaxation procedure exhibited the same behaviour (remained passive with their eyes closed) for the same length of time as hypnotized subjects. Of course this finding does not mean that both groups were faking, but could mean both groups were simply relaxed.

Other research (Evans & Orne, 1971; Orne & Evans, 1965; Kirsch, Silva, Carone, Johnston, & Simon, 1989) used the real-

simulator design of Orne (1959; 1971) to assess whether hypnotic subjects and fakers differed in the tendency to continue responding in the absence of the hypnotist. The rationale for this procedure is that if hypnotic subjects are motivated to respond to pressures to please the hypnotist, then they should stop playing the role once the hypnotist leaves the room. On the other hand, if there is some genuine change in experience during hypnosis, then subjects should remain in this condition for some time after the hypnotist leaves the room without "awakening" them. Low hypnotically susceptible subjects, asked to fool the hypnotist (i.e., simulators), might be expected to stop playing the role as soon as the hypnotist leaves the room. The findings here have been equivocal. Some researchers (e.g., Orne & Evans, 1966) found no differences between real and simulating subjects. On the other hand, others (e.g., Evans & Orne, 1971; Kirsch et al., 1989) found simulators, but not reals, to respond more when the hypnotist was present rather than absent. These latter findings can be interpreted to mean that the responses of highly hypnotizable hypnotic subjects cannot be accounted for in terms of motives to please the experimenter. Alternatively, these findings can be interpreted in terms of a differential demands hypothesis. According to this hypothesis, simulating and real subjects are given different instructions as to what constitutes appropriate responding. The role of the simulator is explicitly defined as one of fooling the hypnotist and being alert to cues which will dictate situationally appropriate responding. The real hypnotic subject, on the other hand, is encouraged to become actively involved in bringing about the subjective experiences called for by the suggestions, as well as constrained by implicit norms for honest reporting. Consequently, any differences in responding between reals and simulators could be parsimoniously accounted for by different demands to which subjects in these groups are exposed. This hypothesis will be further elaborated upon later in this report.

Taken together, research attempting to modify the demands imposed by the presence of experimenters shows some evidence that hypnotic subjects modify their responsiveness when they believe their behaviour is being observed. These findings suggest that impression management motivations may be an important factor in the behaviour of hypnotically responsive subjects.

Compliance and Clinical Populations

Verbal Reports of Experience. Hypnotic procedures have been used to treat a variety of clinical disorders, some which might be considered as learned activities (e.g., obesity, smoking, alcoholism), and others are generally unlearned, nonvolitional events (e.g., migraine headache, warts, hypertension, asthma, cancer; Wadden & Anderton, 1982). In the latter settings, the principal use of hypnosis is to modify an ongoing experience (e.g., pain, tension), similar to the uses of hypnosis in experimental settings. However, the idea that clinical patients would "fake" an absence of pain with hypnotic procedures seems to most an untenable proposal. In fact, this proposal has been articulated by Marcuse (1976), who states that "the problem of shamming or conscious simulation [in hypnosis] is most clearly answered in this question of anaesthesia" (p. 49). However, the motives for compliance in clinical settings are, in fact, plausible. Wagstaff (1981), a leading proponent of the compliance hypothesis, cites from Barber (1970):

The motivation for denial of pain is present in the clinical hypnosis situation. The physician who has invested time and energy hypnotizing the patient and suggesting that pain will be relieved expects and desires that his efforts will be successful, and by his words and manner communicates his desires to the patient. The patient in turn has often found a close relationship with the physician-hypnotist and would like to please him or

at least not to disappoint him. Furthermore, the patient is aware that if he states that he suffered, he is implying that the physician's time and energy were wasted and his efforts futile. The situation is such that even though the patient may have suffered, it may be difficult or disturbing for him to state directly to the physician-hypnotist that he experienced pain and it may be less anxiety-provoking to say that he did not suffer (pp. 211-212).

The denial of pain in response to nonhypnotic clinical procedures is also not uncommon. Mandy, Mandy, Farkas and Scher (1952) found that patients undergoing "natural childbirth" reported to the physician that they were pleased with the methods, but then admitted to an independent observer that the procedure was more painful than they had expected. However, they failed to report this to the medical staff because they did not want to disappoint them (cf., Wagstaff, 1981). Indeed, the expression of pain is moderated by many social and cultural variables unrelated to the experience of pain (D'Eon, 1989). There is no reason to believe that these same factors are not operating for patients receiving hypnotic procedures.

It is important to note that many of the reports extolling the virtues of hypnosis for the control of operative or post-operative pain have been anecdotal and rarely has hypnosis been used as the sole anesthetic for these purposes. Instead, hypnosis has been accompanied by chemical and local anaesthetics, as well as sedation, to control incisional pain, for example (Chaves & Barber, 1976). Incisions of the skin evoke more pain than incisions to underlying tissues and organs, and it has been suggested that general anaesthetics or hypnosis operate to reduce fear and anxiety, which in turn may increase pain tolerance (Barber, Spanos, & Chaves, 1974). This explanation does not imply that patients are withholding information on the painful nature of the experience (i.e., lying or complying), but rather that the patient's belief in the efficacy of the technique reduces pain through the reduction of anxiety and fear.

The "placebo" properties of hypnosis, in terms of its heavy reliance on belief and faith, has a long history which extends from the time of the Franklin Commission Report to current theories of hypnosis (e.g., Hilgard's neodissociation theory). With respect to pain experiences, placebos have been found to be 50% as effective as chemical analgesics, including morphine (Evans, 1985). It seems plausible to suggest that at least part of the apparent insensitivity to pain reported in some cases of hypnotic pain relief are due to the placebo effect (Chaves, 1989; Hilgard, 1977; Wagstaff, 1981). On the other hand, clinical situations contain demands and pressures which might motivate patients to distort or misrepresent the extent of pain experienced. Both explanations imply that (1) placebos may elicit real physiological effects (e.g., endorphin release) that mediate pain, or (2) placebos lead subjects to reinterpret their pain experience as less painful.

In addition to its uses in operative settings, hypnosis has been used to treat cancer pain. A bulk of this literature has been in the form of case reports, and thus subject to their limitations (e.g., inability to determine the relative efficacy of the treatment; Stam, 1989). As with its uses in operative pain, the use of the word "hypnosis" in no way denotes a standard set of procedures (Stam, 1989; Wadden & Anderton, 1982). The criteria for pain relief are often verbal reports of pain reduction, and thus subject to the problems outlined earlier (i.e., patients may misrepresent their experiences because of pressures to report pain reduction). Other criteria for pain relief include requested reductions in narcotic intake by patients or reductions in narcotic prescriptions by physicians. Research on other immune-related diseases (i.e., rheumatoid or osteoarthritis) suggests that physician prescribing behaviour is affected by factors such as patients' coping ideation (Brown, Chaves, & Leonoff, 1981), and thus, the amount prescribed for pain relief

may not necessarily reflect the degree of pain relief experienced by the patient.

Physiological Indices of Pain Experiences

The preceding discussion emphasized that verbal reports of pain in the clinical setting are subject to the same biases and pressures to comply as those in the experimental setting. It might appear that the problem would be solved were one to find an autonomic index of pain; that is, if hypnosis is more than compliance, then it should produce reductions on autonomic indicators of pain that are not under subjects' voluntary control. It has been assumed that these autonomic indices (e.g., galvanic skin response, heart rate, blood pressure) are valid indicators of felt pain.

Both Hilgard (1969) and Spanos (1989) call into question the tenability of the assumption that commonly used autonomic indices are valid reflections of felt pain. In order to be valid indices of felt pain, these autonomic indices should correlate highly amongst themselves and also correlate highly with the intensity of noxious stimulation; in fact, they do not. The correlations are rarely more than moderate in magnitude (Pennebaker, 1982). Furthermore, Spanos (1989) has argued that valid autonomic indices of felt pain should change in response to painful stimuli but not to intense nonpainful stimuli. Again, there is no conclusive evidence that changes occur in one situation and not the other. In short, other factors than felt pain serve to alter autonomic responses. There remains only a single index to check on the validity of these autonomic responses; namely, verbal reports of felt pain (Jones & Flynn, 1989).

Researchers seeking a valid index of felt pain are indeed faced with a dilemma. The validity of both verbal reports and autonomic indicators have been questioned, leaving uncertainty about how to

interpret discrepancies between these indices. Hypnotic subjects who exhibit autonomic changes but verbally report reduced pain might be considered complying or faking. On the other hand, others (e.g., Hilgard, 1977; 1979) have interpreted these discrepancies to reflect autonomic responses to pain that is denied conscious awareness. The tenability of this hypothesis will be reviewed later in this paper.

In addition to the physiological indices cited above, recent efforts to substantiate genuine hypnotic changes in the pain experience have focussed on endogenous opiates. The logic again is, if hypnotic analgesia is opiate mediated, then opiate antagonists like naloxone will eliminate the analgesia. Analgesia here, is determined by verbal reports of reduced pain. In a review of this research, Spanos (1989) concluded that the majority of studies found that naloxone administration had no effect on hypnotic analgesia. Furthermore, an opiate mediation hypothesis cannot account for findings demonstrating location specific analgesia (e.g., right finger of right hand), given that opiate release is a general systemic operation (Spanos, 1989). One possible interpretation of these findings is that, without opiate mediation, analgesia reports simply reflect behavioural compliance.

In summary, it has been difficult to link autonomic indices with verbal reports for the purpose of determining whether subjects are reporting the truth about the nature of their pain experience. It appears that these autonomic indices may themselves be invalid, correlating poorly amongst themselves and with the intensity of noxious stimulation. Another line of research has sought similar means to identify the "truthfulness" of verbal reports in contexts unrelated to hypnosis. It seems plausible to suggest that if there exist valid means of determining whether individuals are telling the truth, then efforts to determine whether hypnotic behaviour is genuine or faked might benefit from adopting these methods.

Physiological Indices of Deception

The concept of lie detection presupposes that there are objective criteria associated with lying. These criteria include autonomic or involuntary indices, either physiological or nonverbal (Fiedler, 1989). The physiological approach involves continuous recordings of galvanic skin response, heart rate, and respiration, all presumably autonomic functions. It is presumed that lying or attempts to deceive in response to critical questions will tend to add an increment to the autonomic responding of lying, as compared to truthful, subjects.

Lie detection originated in an applied context where the incidence of lying is relatively high; namely, in the context of criminal investigations (Lykken, 1974). Specifically, lie detectors or polygraphs, as they are known, have been used as one of the criteria to determine the truth or falsity of the testimony of criminal defendants or the accuracy of witnesses' recall of the events in question. The various criteria used to determine the validity of the lie detection have problems.

Lykken (1974) reviewed various criteria used to determine "objective" truth from which the validity of lie detection diagnosis is measured. One criterion is the courtroom verdict, hardly an infallible criterion. Another criterion is confessions of guilt. This criterion involves the use of samples that may not be representative of most defendants, especially those who have nothing to confess. Lykken (1974) stresses that:

the establishment of lying or truth is often not made on the sole basis of the polygraphic records alone, but rather on a subjective blending in the mind of the examiner of what he has observed in the charts, in the demeanor of the subject during the test, and in the preexamination interview, what he knows of the evidence against the suspect and what he

may infer from the suspect's prior history, and even any prejudices he may hold about the subject's race, age, appearance, and the like. Thus, it is a fact that evidence which might be collected relating to the validity of diagnoses arrived at in this standard manner can only be interpreted as evidence relating to the performance of the particular examiner studied and is almost completely uninformative concerning the objective contribution of the polygraphic data (p. 730).

In short, not only are the standards (e.g., court verdicts, admittance of guilt) used to establish the correctness of lie diagnoses faulty, but the diagnoses themselves are faulty in their impressionistic and subjective basis. Thus, the practice of lie detection seems to be more a human than physiological endeavour, and although humans (e.g., polygraphers) fare better than chance at detecting deception, they are far from perfect (DePaulo, 1981).

As discussed earlier, the concept of lie detection, physiological or otherwise, presupposes that there are objective criteria for truth. The objective criteria serve as a standard against which to measure the index in question. In the hypnotic context, the suggested changes in experience might be authenticated by various objective criteria. For example, responses to hypnotic suggestions for blindness might be compared with the responses of organically blind subjects. In the following section, a variety of methods to evaluate the genuineness of suggested deafness will be discussed. The example of suggested deafness will be used because it is one of the most dramatic hypnotic phenomenon and it will serve as the index of comparison in the proposed study that follows.

Hypnotic Deafness: A Paradigm Case

Hypnotic subjects given suggestions for deafness sometimes report that they "experience" deafness. As an observer, one can infer

that subjects are deaf on the basis of their avowal that they are so. The researcher is faced with the difficult task of determining whether the subjects' reports are honest or dishonest. Of course, it is not necessary to treat all these reports as honest or dishonest.

One approach, outlined earlier, is to disregard these reports and use physiological indices; however, it was concluded that physiological indices do not index "experience;" that someone shows an anomalous heartbeat, breathing pattern, or brain wave pattern tells us nothing about their experience. We must always compare these indicators to verbal reports to check their validity. One clever means of checking the validity of verbal reports of deafness is to ask subjects following their testimony of deafness, "Can you hear me?" If they answer, "No I can't hear you," as some do (Barber, Spanos, & Chaves, 1974), then one might infer that subjects are being dishonest in reporting their experience. For those subjects who do not reply and appear to be deaf, the hypnotist might state, "Now you can hear again," and since subjects typically respond normally following this suggestion reversal, then it seems that they likely could hear all along (Barber, 1979). This type of test would clearly suggest that, at least for hypnotic deafness, there may be a substantial degree of compliance.

The aforementioned method of determining the genuineness of hypnotic deafness has not deterred some early and contemporary investigators from likening hypnotic deafness to naturally-occurring deafness. For example, Erickson (1938) concluded that "there was produced [in hypnotic subjects] a condition not distinguishable from neurological deafness by any of the ordinarily competent tests employed" (p. 149). Similarly, Weitzenhoffer (1953) claimed that "when bilateral auditory insensitivity is suggested...one might expect alterations of sensory functions which cannot be distinguished from those resulting from organic causes" (p. 148). Erickson's (1938) claims were based on evidence from six of thirty highly susceptible

subjects who failed to (a) show any response to embarrassing remarks, (b) raise their voice when reading aloud while an irrelevant continuous extraneous noise became increasingly disturbing, and (c) react to unexpected signs. All of these responses can be easily inhibited voluntarily (Barber, 1979), making a compliance interpretation of these findings equally tenable. Other methods to assess suggested deafness have been equally crude (e.g., distance at which a ticking watch could be heard; Weitzenhoffer & Hilgard, 1967).

The extravagant claims about hypnotic deafness have prompted a number of investigators to adopt other methods which compare the behavioural consequences of suggested deafness with those of actual deafness. A task is required which discriminates the performance of normal and genuinely deaf persons. One task is the bilateral presentation of two tones differing in frequency: normal persons report hearing a fluctuating tone with beats, whereas deaf persons hear a single, steady tone. One early study (Pattie, 1950) employing this method found that despite testimony of suggestion-induced deafness, hypnotic subjects reported a fluctuating tone with beats (i.e., a normal pattern of hearing).

Using bilateral presentation of words, rather than tones, is another method to assess hypnotic deafness. For example, Spanos, Jones, and Malfara (1982) dichotically presented word pair lists to subjects under conditions of unilateral deafness and unilateral (selective) attention. They found that despite subjects' verbal avowals of deafness, auditory information from the supposedly "deaf" ear was registered, as measured by subjects' performance on a recognition task. This discrepancy between verbal and objective indices could be interpreted to mean that subjects were complying to experimental demands to report deafness.

Other investigators have employed an alternative method known as delayed auditory feedback (DAF), whereby a speaker's

own voice is played back with a brief lag. During this task, normal persons typically stutter, mispronounce words, and speak more loudly and slowly; genuinely deaf persons show none of these disruptions of speech. Five independent tests of this hypothesis (Barber & Calverley, 1964c; Kline, Guze, & Haggerty, 1954; Kramer & Tucker, 1967; Schiebe, Gray, & Klein, 1968; Sutcliffe, 1961) have shown that hypnotically deaf subjects respond on this task as do subjects with normal hearing. One parsimonious explanation for these findings is that subjects who report "deafness" are lying or simply complying to experimental demands.

The DAF method has received criticism (Jones & Spanos, 1982; Spanos, Jones, & Malfara, 1982) for its crude classification of subjects as "deaf" and "not deaf"; that is, subjects who show some, but not total, speech disruption are classified as "not deaf." Efforts to find indices which possess both sensitivity and discriminability have centred on psychophysical procedures, such as threshold-estimation and signal detection procedures. The former procedures involve measuring auditory thresholds (in decibels) corresponding to hypnotic suggestions, and have yielded results which suggest genuine reductions in sensitivity following hypnotic suggestions for deafness (Black & Wigan, 1961; Crawford, MacDonald, & Hilgard, 1979; Korotin, Pleshkova, & Suslova, 1969). Unfortunately, it is now widely believed that these procedures confound genuine changes in sensitivity with changes in response bias (cf., Sheehan, Smith, & Forrest, 1982). As Jones and Flynn (1989) stated, "If subjects have a higher threshold for the detection of a tone after a suggestion for hypnotic deafness, have the suggestions produced a change in sensitivity or have the subjects changed their criterion for detection? (p. 164)"

Signal detection procedures (SD; Green & Swets, 1966) have been adopted over threshold-estimation procedures to arrive at relatively independent estimates of sensitivity and response bias. SD

procedures meet the criterion of independent estimates because they simultaneously consider the number of correct and incorrect signal responses (i.e., hits and false alarms), which threshold-estimation procedures do not. Some researchers have interpreted shifts in response bias as an index in motivational and situational factors (e.g., Naish, 1986), which can in turn lead to a change in subjects' experience. In fact, one contemporary hypnosis theorist, Naish (1986), subscribes to the belief that hypnotic behaviour reflects a perceptual style characterized by a lability in criterion placement of what one might consider the presence or absence of a stimulus. Note, that Naish claims that experiential changes do occur, and thus hypnotic subjects are not merely being compliant. Support for a compliance hypothesis would be evidenced by *no change* in either sensitivity or response bias, assuming each were outside the voluntary control of subjects.

In research evaluating the effect of hypnosis *per se*, there is no evidence that hypnotic procedures bring about reductions in either sensitivity or response bias (Jones & Spanos, 1982). Furthermore, related attempts to conceive of hypnotizability as a labile perceptual style have, by and large, failed. Only a single study (Naish, 1983) out of several (Graham & Schwartz, 1973; Jones & Spanos, 1982; Sigman, Phillips & Clifford, 1985) found a relationship between hypnotizability and criterion shifts. Other research using the visual modality has shown more disconfirming (e.g., Jones & Spanos, 1982; Sheehan, Smith, & Forrest, 1982) than confirming evidence (Farthing, Brown, & Venturino, 1982) for this relationship.

It is important to note that criterion shifts are not interpreted according to signal detection theory as corresponding to changes in experience, as Naish (1986) seems to infer (Gregg & Whitely, 1985). Secondly, indices of sensitivity are not immune to voluntary manipulation by subjects (e.g., focussing of attention) as some have suggested (Jones & Flynn, 1989; Jones & Spanos, 1982). Jones and

Flynn (1989) have argued, following Watson and Clopton (1969), that measuring the effects of suggestion compared to baseline assumes that subjects are performing maximally or asymptotically during baseline conditions. Research (e.g., Spanos, Hodgins, Stam, & Gwynn, 1984; Watson & Clopton, 1969) indicates that subjects will modify baseline responses, or "keep something in reserve" when they know their baseline performance will be compared to performance under other conditions. It seems that demand characteristics are an integral part of all psychological research, including psychophysical research.

The problem of evaluating the genuineness of hypnotic deafness (to many, a defining feature of hypnosis) continues to plague researchers in this field. Several methods specific to the auditory modality have been unsuccessful in producing results which suggest any genuine change in the experience of sound following suggestions for deafness. These findings have not ruled out a compliance interpretation of the findings; in fact, such an hypothesis is both a tenable and parsimonious one.

A number of different experimental designs have been used for evaluating hypnotic deafness. The nature of the control procedures, groups and conditions have varied across studies. For example, hypnotic procedures have been compared with (1) baseline no-suggestion, (2) nonhypnotic suggestion, (3) task-motivational instructions with or without demands for honesty, (4) simulating control groups, and (5) cognitive-simulating control groups. These studies have employed both within and between subject designs, and with subjects matched or not matched on hypnotizability. The adequacy of a compliance, or any other hypothesis, will be judged according to the nature of the control groups employed. The various methods to be discussed have different theoretical underpinnings, reflecting the assumptions of those that employed them. The following discussion will outline these methods, with particular emphasis on Orne's (1959; 1971) real-simulator paradigm and the

findings obtained from its use. This latter paradigm is widely used in the field and is particularly relevant for evaluating the compliance hypothesis. Its proponents have allegedly discovered one genuine aspect of hypnotic experience called trance logic. An alternative paradigm will be proposed for the purpose of testing the compliance hypothesis of hypnotic responding, and a research program will be proposed which attempts to employ a convergent inquiry strategy to evaluate the assumptions of that particular research strategy.

Contemporary Behavioural Methods of Assessing Compliance

Barber's Task-Motivational Paradigm

Early experimental research and much contemporary clinical research has implicitly assumed that responses such as analgesia, hallucinations, amnesia, and so forth have a zero base rate; that is to say, such behaviours are nonexistent in a normal population without hypnosis (Barber, Spanos, & Chaves, 1974; Sarbin & Coe, 1972). Under this assumption, rates of response greater than zero are presumed to reflect a unique and genuine psychological change caused by the hypnotic induction procedures. Two investigators, both in the behaviourist tradition, challenged these assumptions by placing the study of hypnosis firmly within the bounds of modern experimental science. The first was Clark Hull who, as discussed earlier, introduced the use of unhypnotized (waking) control subjects or control conditions. The second was T. X. Barber who proposed an alternative control group as part of a paradigm to understand hypnotic behaviour. This control group, known as task-motivational, reflects an alternative theory of hypnotic responding (Chaves, 1968; Sarbin & Coe, 1972; Sheehan & Perry, 1976).

From the time of Mesmer, almost every prevailing theory of hypnosis involved the notion that hypnosis was extraordinary behaviour brought about by an extraordinary cause. The reports of painless surgery by Esdaile, the relief and cure of innumerable diseases, feats of muscular strength and endurance, and so forth, were often accounted for by some special physical or psychological process (e.g., magnetic fluids, neurological anomalies, altered state of consciousness, trance state). This special process was believed to be both genuine (i.e., a qualitative change occurred in hypnotic subjects' experience) and unique to the hypnotic condition. Since this hypothetical construct (hypnotic "state") could not be defined independently, it could only be inferred from the hypnotized persons behaviour. It was Barber (1964b) who astutely noted that such inferential reasoning was circular; a subject is said to be in an hypnotic state if he responds to hypnotic suggestions, and, conversely, a subject is said to be responsive to hypnotic suggestions because he or she is in the hypnotic state. Other criteria that have been used to infer an hypnotic state (e.g., hypnotic-like appearance, subjects' testimony that they were hypnotized) can vary independently (i.e., are poorly related to one another), which one would not expect if these behaviours were indicative of some underlying state (Chaves, 1968; Spanos & Barber, 1974). Their use to infer an hypothetical hypnotic state also leads to the same type of circular reasoning. In short, the traditional assumptions about the "essence" of hypnosis, according to Barber, could neither be validated or falsified empirically.

In light of these problems, Barber found it scientifically useless to pursue the question of "What is the nature or essence of hypnosis;" instead, he found it more useful to ask the question "What antecedent conditions are necessary or sufficient in eliciting behaviours traditionally labeled as hypnotic?" (Chaves, 1968, p. 592). By concentrating his efforts on independent and manipulable

conditions, rather than a construct that heretofore was not defined independently of the behaviour giving rise to it, Barber was able to propose cause-effect chains that were amenable to validation and falsification, the hallmarks of scientific explanations.

A summary of Barber's theory and empirical work is very important because of the impact it has had on our current understanding of hypnosis and the method by which we study it. The account here will be deliberately brief because several detailed accounts already exist (e.g., Barber, 1969, 1979; Barber, Spanos, & Chaves, 1974; Chaves, 1968; Sarbin & Coe, 1972; Sheehan & Perry, 1976), and deliberately selective to emphasize those conditions within an hypnotic situation which bear on a compliance hypothesis.

Barber's two decades of extensive and systematic study has highlighted several situational conditions for eliciting behaviours labelled "hypnotic." These include: (a) reducing the ambiguity of the situation and expected response by giving explicit instructions and situational definitions, (b) emphasizing the ease with which the suggested effects can be experienced, (c) emphasizing the importance of subjective involvement in the suggestion-related imaginings, (d) emphasizing the importance and instilling positive attitudes and favourable motivation for successful responding.

Barber established the importance of these conditions by drawing subjects either unselected or preselected for hypnotizability, and randomly assigning them to one of three conditions. He compared the behaviour of subjects administered an hypnotic induction procedure with two independent groups not administered these procedures before receiving suggestions. Instead, these control groups either received (a) brief instructions exhorting them to try their best to respond to the forthcoming suggestions together with statements that it is easy to experience the suggested effects (these two variables in combination were referred to by Barber as "task motivational instructions"), or (b) no preliminary motivating

instructions before receiving the forthcoming suggestions. As two of Barber's principal co-investigators (Spanos & Chaves, 1989) have recently documented, the results of this research have shown that : (a) the baseline responding of control subjects administered no preliminary instructions was far greater than zero, (b) compared to the latter baseline levels, hypnotic procedures produced a small increment in responsiveness to suggestions, and (c) instructions to maximize motivation were as effective as hypnotic procedures in enhancing responsiveness to suggestions. Since the behaviour (overt and experiential reports) of task-motivated subjects can be traced to instructions designed to motivate, and since this behaviour is similar to that of the "hypnotized" subjects, then one tenable hypothesis is that hypnotic behaviour is a function of the four conditions outlined earlier.

Note that Barber and his associates have preferred between-subjects or mixed designs, rather than within subjects designs (i.e., testing a single group of subjects under hypnotic and nonhypnotic conditions). The latter design is indeed more sensitive to small treatment effects, and has led some to criticize Barber's design as being insensitive to these effects (Hilgard & Tart, 1966). Nonetheless, Barber rejected this argument on the grounds that within-subjects designs are vulnerable to systematic order effects. One such effect is that subjects may "hold back" in one condition (i.e., nonhypnotic) if they expect another treatment (i.e., hypnotic) to be administered. Hull (1933) recognized such a possibility long ago. Furthermore, there are implicit and explicit demand characteristics, for change across conditions, in the procedures of the within-subjects design. There is a bulk of evidence (Barber, 1962; Stam & Spanos, 1980; Spanos, Hodgins, Stam, & Gwynn, 1984; Zamansky, Scharf, & Brightbill, 1964) in support of Barber's postulate.

Barber's work was criticized on several grounds. The bulk of these criticisms have been theoretical or based on the logic

underlying Barber's framework. Sheehan and Perry (1976) have described these as the logic of alternative explanation and the logic of equivalence. With respect to the logic of alternative explanation, it has been said that Barber's framework indeed offers an alternative account, but it does not unequivocally reject an account which posits unique properties for hypnotic behaviour. This criticism, of course, is incontestable and can be levelled against all paradigms, within hypnosis (e.g., Orne's real-simulator paradigm) and without. Barber has also been criticized on the grounds that he erroneously infers that comparable effects (i.e., behaviours) reflect similar causes and subjective experiences. These critics (e.g., Bowers, 1967; Evans, 1968; Tart & Hilgard, 1966) have argued that because the same behaviours follow hypnotic and nonhypnotic (e.g., task-motivational) instructions, it does not mean that hypnosis *is* task motivation or that the behaviours are brought about by the same mechanisms. It is puzzling that these same critics (Evans, 1968; Tart & Hilgard, 1966) have explained the equivalence of the two behaviours in terms of the task motivated subjects spontaneously "slipping into hypnosis" because these instructions are "trance-inducing;" in other words, they criticize Barber for inferring a similar [nonhypnotic] mechanism, and then proceed to offer an account for these behaviors in terms of a similar [hypnotic] mechanism! Certainly, if these criticisms of Barber's logic are to be seriously entertained, then they should avoid the very problems they seek to address.

Honesty Demands and Compliance

There is one criticism directed at Barber's "logic of equivalence" that has special importance to the issue of compliance. Bowers (1967) argued that, although Barber (e.g., Barber & Calverley, 1964d) found that hypnotic and task-motivated (TM) subjects report similar subjective experiences, the testimony of TM subjects reflects

behavioural compliance whereas that of hypnotic subjects reflects genuine changes in subjective experience.

To eliminate compliant responding, Bowers (1967) and others have sought to remove these pressures by administering cautionary statements about honest reporting. The rationale here is that if a particular response (e.g., hypnotic or task-motivational) is reduced or eliminated when pressures for compliance are removed, it is reasonable to conclude that the response is normally biased, or completely accounted for, by compliance (Wagstaff, 1981). Note, that this rationale assumes that the honesty demands themselves contain no pressures to comply, an assumption which has recently been challenged by Spanos (1986b). This issue will be taken up later in this report.

Bowers (1967) tested two independent groups of subjects given TM instructions; however, before eliciting subjects' testimony about the nature of their suggested experience, one group was administered demands for honesty and the second group was not. These demands consisted of repeated admonitions to report only what one truly experienced without regard to the desirability of the response or the expectation of the experimenter. These instructions further stated that the suggested experience was in no way as easy as previously implied. In support of his predictions, Bowers found that subjects given honesty demands with TM instructions reported less experiential changes (i.e., less vivid hallucinations) than those subjects not exhorted to be honest. These findings had no bearing on Bowers' speculation of Barber and Calverley's (1964) findings for different experiences of hypnotic and TM subjects: Bowers failed to test a group of hypnotized subjects.

Spanos and Barber (1968) attempted to test Bowers' compliance hypothesis by directly comparing an hypnosis with a TM group, with and without demands for honesty. For visual, but not auditory hallucination suggestions, the honesty demands served to

decrease the reported intensity of the hallucinatory experience of task motivated subjects, replicating Bowers (1967) findings. On the other hand, these same demands administered to hypnotic subjects did *not* result in reports of reduced intensity of experience. Bowers (1976) has interpreted these findings as support for his compliance hypothesis for task-motivational responding and has added that the lack of experiential changes in these TM subjects makes such control groups inadequate for comparison with hypnotic behaviours.

Bowers' interpretation has illuminated two issues which bear on every theoretical and methodological approach for studying hypnotic behaviour: (a) what is an adequate comparison or control group for hypnotic groups? and (b) are the demand characteristics, or subjects' interpretation of them, the same for hypnotic and control groups? Bowers (1967, 1976) claims that the demand characteristics are different for hypnotic and TM subjects, with hypnotic subjects responding honestly about genuine changes in experience and TM subjects responding dishonestly.

Bowers' hypothesis about the compliant nature of responding in TM but not hypnotic subjects has received some theoretical (Hilgard, 1973) and empirical (Sheehan and Dolby, 1974) support. For example, Sheehan and Dolby (1974) argued that, whereas hypnotic instructions stress subjects' natural responsivity to test suggestions and letting things "happen," the TM instructions have a distinctly [socially] pressuring quality about them. To illustrate the point, they cite Barber's (1969) TM instructions verbatim:

In this experiment...everyone passed these tests when they tried....If you don't try to the best of your ability, this experiment will be worthless and I'll tend to feel silly. On the other hand, if you try to imagine...you will be helping this experiment and not wasting any time [p.46].

Sheehan and Dolby (1974) found that when such pressures were included with hypnotic induction procedures, subjects perceived the instructions as equally pressuring as TM instructions, and more pressuring than hypnotic instructions without such exhortations. These subject perceptions translated into similar behavioural patterns, suggesting to those authors that a TM group is an inadequate comparison group and one whose behaviour simply reflects behavioural compliance. While this may be true, the authors offer no evidence that their behaviour was a result of pressures to comply, or that the behaviour of hypnotic subjects was *not* a result of pressures to comply.

Sheehan and Dolby's (1974) assertion, that hypnotic inductions lack "pressures to comply," deserves careful notice. Most researchers have adopted their inductions from those used with contemporary hypnotizability scales, all of which are essentially revisions and extensions of an instrument developed by Friedlander and Sarbin (1938). The induction used with this scale includes statements such as:

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, you can remain awake all the time and pay no attention to me. In that case you might make me look silly, but you are only wasting time. However, if you pay close attention to what I say, and follow what I tell you, you can easily learn to fall into a hypnotic sleep. In that case you will be helping this experiment and not wasting any time [Sarbin & Coe, 1972, p. 178].

The Barber Suggestibility Scale (BSS; Barber, 1969) and the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos, Radtke, Hodgins, Stam, & Bertrand, 1983) use exactly the same statements, and are both used extensively in experimental research.

Other scales such as the Stanford Scale of Hypnotic Susceptibility: Forms A, B, and C (Weitzenhoffer & Hilgard, 1959, 1962) and the Harvard Group Scale of Hypnotic Susceptibility: Form A (Shor & Orne, 1962) include similar statements. Consequently, Sheehan and Dolby's (1974) contention for the lack of strong pressures for compliance in hypnotic induction procedures, is questionable.

Spanos and Barber (1968) have also interpreted their own findings in terms of a differential demands hypothesis; however, unlike Bowers, this interpretation places the differential demands within the honesty reports rather than the preliminary TM or hypnotic instructions. Spanos and Barber conceive of the demands for honesty as replete with the same cues for desired responding (i.e., demand characteristics) that the preliminary TM and hypnotic instructions contain. The honesty demands are interpreted by the TM subjects as requests to ignore the previous TM instructions (i.e., the experimenter lied earlier about the ease with which everyone could experience the suggested effects). Hypnotic subjects, not told of the ease and generality of the suggested experience, will likely not interpret the demands for honesty as a request to ignore the hypnotic instructions; instead, their task is to continue behaving like an hypnotic subject. This interpretation does not imply that the testimony of hypnotic subjects is not honest, nor does it imply that that of TM subjects is dishonest; rather, both reflect a genuine "belief" in a subjective change in experience.

Subsequent tests of the compliance and honesty issues have left the hypothesis open. For example, Spanos, Barber and Lang (1974) presented data on hypnotic analgesia and demands for honesty [with unselected subjects] which failed to replicate their earlier findings (i.e., Spanos & Barber, 1968) that honesty demands reduce the intensity of the hypnotic experience. Other investigators have used a variety of means to elicit honest reporting with amnesia, rather than analgesia or hallucination, suggestions. These subjects are

required to recall information following instructions to forget. In this task, a compliant subject is one who deliberately withholds remembered information when asked to recall it, whereas a genuinely amnesic subject is considered one who is *unable* to recall the information.

The methods used vary widely in the degree of demand for amnesia breakdown (Coe, 1989). The nature of the control groups include either task-motivation groups or simulators. They include: honesty demands (Bowers, 1966; Kihlstrom, Evans, Orne, & Orne, 1980); opportunities to "own up" to role-playing (Wagstaff, 1977); video-cued recall demands using the real-simulator paradigm [see next section] (McConkey, Sheehan, & Cross, 1980; McConkey & Sheehan, 1981); lie-detector demands or honesty demands (Coe & Yashinski, 1985; Howard & Coe, 1980; Schuyler & Coe, 1981, 1987), and; a combination of honesty, lie-detector (Coe & Tucibat, 1988), and video-cued recall demands (Sluis & Coe, 1987). Like the previous evidence on honesty demands with nonamnesia suggestions, this research has indicated that (a) simple additional requests to recall (without pressures to recall more) resulted in greater recall for about 50% of initially amnesic subjects, (b) about 50% of initially amnesic subjects show increased recall (i.e., breach) when additional requests are accompanied with mild pressures to recall more information, and (c) under repeated [stronger] pressures to remember, virtually all initially amnesic subjects will offer some of the to-be-remembered information (Coe, 1989). But, what about those few subjects who do not breach amnesia despite strong pressures to remember?

One interpretation of the finding that some subjects do not breach despite pressures to do so is that the to-be-remembered information is dissociated from conscious control so that it cannot be accessed voluntarily (Hilgard, 1974; Kihlstrom, 1978). An alternative interpretation is that exhortations of honesty are themselves pressuring to subjects; in other words, asking someone to be honest

may imply that they are suspected of lying. Subjects who respond under these conditions (i.e., breach amnesia) would be implicitly acknowledging that they had been dishonest earlier (Spanos, 1986a). Thus, subjects who maintain that they cannot remember can be construed as trying to remain consistent with their original statements (even if false) and preserve the integrity of their role. One role may be that of a good (responsive) hypnotic subject (Spanos, 1986a); another role may be that of an "honest" subject. These roles may overlap such that subjects may respond to the initial amnesia suggestion and then show partial breaching (i.e., additional recall) when pressured to do so; such incomplete responding may represent an attempt by the subject to manage a responsive but honest impression to the experimenter.

The preceding discussion highlights that demand characteristics may determine behaviour in hypnotic settings. Even when experimenters attempt to remove these pressures, they are inadvertently applying other demand cues. Responses attributable to hypnosis are very difficult to tease apart from compliant responses brought about by the demand characteristics in the experimental setting. Barber exposed the assumption of unique properties of hypnosis to empirical test using one form of experimental design. Others have used different forms of control, with the assumption that there was an "essential" property to hypnosis. Of the means to establish such properties, Orne's Real-Simulator Design has received the most attention.

Orne's Real-Simulator Paradigm

The rationale for the real-simulator paradigm is similar to that of Barber's task-motivational paradigm. Specifically, if a group of un hypnotized control subjects exhibits behaviours which are indistinguishable from those of an hypnotic group, then the

possibility exists that a similar mechanism is accounting for their behaviours (e.g., demand characteristics). The logic here, that of *equivalence* and *alternative explanation*, is precisely the same as that underlying Barber's paradigm. Both Barber and Orne endorse White's (1941) view that hypnotized subjects are highly motivated to please the hypnotist and behave in a manner characteristic of a hypnotized person. It is here where their assumptions begin to diverge.

There is one fundamental difference in the assumptions underlying these two paradigms. Whereas Barber (1969) defined hypnosis in terms of its antecedent conditions, Orne (1959; 1971) defined hypnosis as a change in the subjective experience of subjects, which if present, could be reflected in hypnotized subjects' behaviour. These assumptions have led each to design different methods.

For Orne, a control group was desired which would not share the experiences of hypnotized subjects, but would nevertheless be exposed to the same demand characteristics and testing procedures. To satisfy such requirements, Orne's control group is comprised of unhypnotizable subjects who are exposed to hypnotic procedures without experiencing their effects. The problem here is that these subjects, almost by definition, are not highly motivated to please the experimenter or behave in the role of hypnotically responsive subjects. In other words, they are unresponsive to the demand characteristics of the hypnotic setting. One means of enhancing their motivation to respond to these cues is to encourage them to simulate the role of a good hypnotic subject. In order to legitimate the act of faking or simulating hypnotic behaviours, the experimenter must be kept blind to the status of the subject (i.e., real or simulating). In other words, the simulating subjects' role is to fool the hypnotist by responding as they believe that a good hypnotic subject would respond. This procedure, according to Orne (1959; 1971), equates the

control and hypnotic groups in terms of test procedures, the demand characteristics in the setting, and the subjects' motivation to comply with these demands; the only difference which remained, Orne argued, is the ability of subjects in the two groups to experience hypnosis.

The design, like Barber's, is an independent group design. The control or simulator group is comprised of un hypnotizable subjects, whereas the experimental group consists of those capable of experiencing suggested effects (i.e., highly hypnotizable subjects). In other words, the two groups receive the same treatments but are initially different on a subject-variable: hypnotizability. Orne's procedure is intended to tease out the elusive "genuine" component to hypnotic responding by comparing a group of compliant subjects (i.e., those motivated to show overt responsiveness but no subjective responsiveness) to a group of subjects motivated to show overt responsiveness, some of which may be accompanied by subjective changes. Those overt behaviours which differ between the groups are assumed to be those accompanied by subjective changes. Those overt behaviours which are indistinguishable between groups, Orne (1971) warns, are not necessarily due to demand characteristics. Under such circumstances, Orne (1971) argues that either hypnosis or demand characteristics could parsimoniously account for the hypnotized subject's behaviour. This caveat absolves Orne from the criticism that Barber has received about the logic of equivalence, and qualifies his simulating group as a "quasi-control" group.

In the first application of this paradigm, Orne (1959) examined a class of responses which had been heretofore taken as proof positive of the "reality" of hypnosis: visual hallucinations. The suggestion and procedure, however, was modified to include visual stimulation which would challenge the reality status of the hallucination. The procedure involves the experimenter, an associate, and the subject all sitting down facing one another. The subject is

asked to close his/her eyes and then the hypnotic induction is administered. During this time, the associate silently rises from the chair and walks behind the subject, outside of his/her field of view. After the induction, both real and simulating subjects are asked to open their eyes and hallucinate the associate sitting in the empty chair in front of them. Orne found that some of the hypnotic, but none of the simulating, subjects reported both seeing the associate and seeing the chair through him (i.e., transparency response). When attention was called to the real associate standing behind the subject, Orne found that real, but not simulating, subjects reported seeing two images of the same person (i.e., double hallucination response). Simulators either claimed to not see or recognize the actual associate. Occasionally the simulators recognized the associate but then claimed that the hallucination had vanished.

The responses of the simulators were considered by Orne (1959; 1971) to be "logical" in the sense that (a) the same person cannot be in two places at once, and (b) a real person is opaque and consequently it is logically impossible to see through him or her. The real hypnotic subjects, Orne (1959) claimed, did not conform to this type of logic. Instead, these subjects exercised an unusual type of logic, he coined "trance logic," defined as

...the ability of the [high susceptible hypnotic] subject to mix freely his perceptions derived from reality with those that stem from his imagination and are perceived as hallucinations....These perceptions are fused in a manner which ignores everyday logic...the absence of expression of a need for logical consistency seems...to be one of the major characteristics of hypnosis (pp. 294-295).

Orne's account that the hypnotized person's logical faculties are held in abeyance has some similarity to those of his contemporaries like Sarbin (1950), who has stated that "When the subject aptly takes the

hypnotic role, a shift occurs from a sharp, alert, objective and critical attitude to a relatively relaxed, diffuse, and uncritical one" (p. 206). Another account, which like that of Sarbin, does not consider this "logic" as specific to hypnosis, is that of Shor (1959) who discusses hypnosis as a "...fading of a generalized reality orientation" (p. 594). A third account of Hilgard (1977) describes hypnosis as "...a shift in perceptual or observational functions...from the normal realistic critical observation of events" (p.58).

Although Orne's (1959) original findings were presented as an anecdotal account, a substantial amount of empirical research has followed. The research has focussed on the reliability of Orne's findings of the two types of hallucination responses and the development of other indices of trance logic. This research has also served to challenge both the assumptions underlying the paradigm and Orne's interpretation of his findings. Detailed reviews of these issues are available elsewhere (see Spanos, deGroot, & Gwynn, 1987). Consequently, only those which bear on the compliance issue will be discussed. That is, whether the real-simulator paradigm is a reliable and valid means of evaluating the degree of compliance in hypnotic settings.

Reliability. Subsequent to Orne's (1959) original anecdotal report, a number of empirical efforts were directed at evaluating the reliability of the double and transparency hallucination responses as discriminating criteria for compliance versus genuine hypnotic responding. These studies have differed in the procedures used to assess hypnotizability, transparency and the object to be hallucinated. This research has consistently found the double hallucination response to be unreliable as an index for discriminating reals from simulators. Seven studies failed to find differences between these groups on the double hallucination response (Blum & Graef, 1971; Johnson, Maher, & Barber, 1972; McDonald & Smith,

1975; Peters, 1973; Sheehan, Obstoj, & McConkey, 1976; Spanos, deGroot, & Gwynn, 1987; Spanos, deGroot, Tiller, Weekes, & Bertrand, 1985). According to Orne's model, similarity in performance allows one to postulate that hypnotic subjects could be responding for the same reasons as the simulators; that is, complying to demand characteristics. In response to these failures to replicate, Orne and Hammer (1974) argued that trance logic is a nonsuggested response of hypnosis. They noted that in all these studies, the experimenter highlighted that the person behind should be acknowledged and so enhanced the probability of a trance logic response being observed in simulators. Orne and Hammer's (1974) hypothesis failed to be substantiated when cue structure was varied (Sheehan, Obstoj, & McConkey, 1976). It seems that the double hallucination response is an unreliable discriminator of reals and simulators.

On the second index of trance logic, transparency responding, research has consistently been in support of Orne's finding of differences between reals and simulators (Johnson et al., 1975; McDonald & Smith, 1975; Peters, 1973; Sheehan et al., 1976; Spanos, Bridgman, Stam, Gwynn, & Saad, 1983; Stanley, Lynn, & Nash, 1986). From Orne's model these data can be unequivocally interpreted to mean that the behaviour of hypnotized subjects is not a function of demand characteristics or efforts on the subject's part to comply with these cues. This interpretation is based on the assumption that real and simulating subjects are exposed to the same demand characteristics; that is, there are no treatment effects of performing the task of pretending to be hypnotized and trying to deceive the experimenter. This assumption has been retracted by Orne (1979) as has his earlier interpretation that real-simulator differences are proof positive of a genuine hypnotic element. The utility of the paradigm is substantially compromised if it fails to meet the purpose for which it was designed; that is, to eliminate a compliance interpretation of real-simulator differences.

Before rejecting Orne's paradigm as useless and proposing an alternative, it is important to highlight its weaknesses so that a new paradigm can avoid such. The problem with Orne's (1959) design is that it overlooks that simulating subjects are asked to do something quite different from real hypnotic subjects, and as such its adequacy as a control procedure is questionable. This criticism has been highlighted by several investigators, including Sheehan (1970, 1971a), Spanos (1986b; Spanos & Radtke, 1981), and Wagstaff (1981). These criticisms will be discussed below.

Validity

Adequacy of Simulators as Controls. In contrast to the reliability issues above, the adequacy of simulators as controls is an issue which bears upon the validity of Orne's paradigm for inferring compliance or noncompliance in hypnotized subjects. According to Orne (1959), differences between the real and faking subject that cannot be accounted for by the *faking situation* may be viewed as characteristic of hypnosis" (p. 293, italics added). The simulation control procedure is characterized by two conditions: the absence of hypnosis and the presence of the simulating task. As such, it differs from the usual control condition in that not all factors other than the experimental treatment (i.e., hypnosis) are kept constant (Sheehan, 1971b).

Orne's paradigm assures meeting the "absence of hypnosis" condition because simulators are unhypnotizable (the issue that subject and treatment variables are confounded will be taken up later). On the other hand, the nature of the simulating situation or task, the second necessary requirement to interpret real-simulator differences, was completely overlooked by Orne (1959), with the exception of the vague description that simulators are "faced with a problem solving task; namely to utilize whatever cues are made

available by the experimental context and the experimenter's concrete behavior in order to behave as they think the hypnotized subjects might" (Orne, 1962, p. 782).

The task of identifying differences that can be accounted for by the faking situation was elucidated by several investigators. For example, Sheehan (1970; 1971a) has shown that simulating behaviour will vary according to the ambiguity or structure of the task. When subjects are uncertain as to what responses would satisfy the demands of the test situation (i.e., ambiguous task), subjects either restrict or inhibit their responses. This notion of incomplete responding has been elaborated upon by Spanos (1986b) who has focussed both on the index used to compare reals and simulators and on the actual task of a simulating subject.

Spanos (1986b) has offered a *differential demands hypothesis*, in contrast to Orne's logical *incongruity hypothesis*, to explain real-simulator differences. According to this hypothesis, real, in contrast to simulating, subjects are required as part of their task to become actively involved in bringing about the subjective experiences called for by the suggestions. A visual hallucination suggestion, like that employed by Orne (1959), is perceived to be transparent simply because the visual imagery generated when the eyes are open tends to be transparent. Nonhypnotic suggestions for visual hallucinations are also described by subjects as transparent (see reviews by Spanos & Radtke, 1981). The simulator's task, on the other hand, is to not experience subjective effects but instead to produce overt responses which are reflective of an excellent or ideal hypnotic response. If the suggestion is to see and interact with a visual hallucination, the ideal response is to report a clear, vivid, solid image, not an incomplete or transparent image. In short, transparency reporting is a function of accurate and honest reporting of imperfect imagining.

Spanos' (1986b) differential demands hypothesis has been used to interpret other indices purported to be incongruous. The

validity of these indices has been gauged by their ability to distinguish real from simulated behaviours.

Other indices of incongruous responses. In addition to the transparency and double hallucination responses, there have been a variety of responses considered as tapping incongruous or trance logic responding. If these responses were indicative of some empirically valid construct, then one would predict a high correlation amongst responses on these incongruous tasks. Moreover, scores on each of these indices would be expected to be higher in subjects who are predisposed to behave in an incongruous fashion (i.e., high hypnotizables).

The available evidence (Obstoj & Sheehan, 1977; Spanos deGroot, Tiller, Weeks, & Bertrand, 1985) on the relatedness of so-called incongruity tasks fails to support the construct validity of trance logic. The intercorrelations are mostly low and nonsignificant. These findings indicate that the tasks which supposedly distinguish real and simulating behaviours may not be tapping the same construct.

The second notion which would validate incongruous responding as a distinguishing characteristic of reals and simulators is a significant relationship between hypnotizability and incongruous responding. Aside from transparency responding with visual hallucinations, there is only a single task which has been found to discriminate reals from simulator. The indices of this particular task, age regression, include: (1) correct spelling of complex words (i.e., *incongruous writing*), and (2) subjective reports of feeling like both a child and like an adult either simultaneously or alternately, called *duality* or *dualism* (Orne, 1951; Perry & Walsh, 1978). The behaviour of reals, but not simulators, is characterized by this pattern of responding. The findings here have been linked to another presumed index of incongruous behaviour known as *hidden observer*

responding (Hilgard, Hilgard, Macdonald, Morgan, & Johnson, 1978; Nogrady, McConkey, Laurence, & Perry, 1983). The latter index has been found to be highly dependent on experimenter cues, demands, and expectations (see Spanos, Gwynn, & Stam, 1983; Spanos & Hewitt, 1980), and thus can be parsimoniously explained through compliance with experimental demands (Wagstaff, 1981).

In summary, there are three reliable indices of incongruous responding which distinguish real from simulating subjects: transparent hallucinations, incongruous writing and duality in age regression. Orne (1979) has interpreted these indices as reflecting essential properties of hypnosis. Spanos (1986b) has interpreted these indices as both examples of incomplete responding due to imperfect attempts by motivated subjects to sustain the suggested experiences as subjectively compelling. Neither theoretician has claimed that hypnotic behaviours are faked or dishonest.

The ability of the real-simulator paradigm to detect faked behaviour is poor given that neither behavioural similarities nor differences can be interpreted as compliant responding. The paradigm's validity has also been questioned because it confounds treatment and subject differences. Barber (1962) and others (e.g., Sheehan & Perry, 1976; Wagstaff, 1981) have argued that when differences emerge between reals and simulators it is impossible to know whether the differences are due to subject variables (i.e., hypnotizability) or treatment variables (i.e., hypnosis, suggestion-related imaginings). This has led to several modifications to the real-simulator paradigm. These modifications and findings include the following:

- (1) inclusion of an imagination control group or nonhypnotic reals to determine the specific effect of an hypnotic induction procedure (Johnson et al., 1972; Obstoj & Sheehan, 1977; Spanos, Bridgeman, Stam, Gwynn, & Saad, 1983). Hypnotic and nonhypnotic reals perform

similarly to each other on trance logic tasks, but both perform differently from simulators;

(2) inclusion of a group of highly hypnotizable simulators to unconfound subject and treatment factors (Austin, Perry, Sutcliffe, & Yeomans, 1963; Spanos et al., 1983; Spanos et al., 1987). High and low susceptible simulators perform similarly to one another, but both perform differently from hypnotic reals;

(3) inclusion of a group of cognitive-simulators who are instructed to simulate hypnosis but with imaginative involvement (Wagstaff & Benson, 1987). In samples unselected for hypnotizability, the overt behaviours and reports of nonvolition are similar between real and imaginably-involved simulators;

(4) manipulating demands to comply by altering surveillance of real and simulating subjects. This includes the "disappearing hypnotist" design (Evans & Orne, 1971; Orne & Evans, 1966) and the "surreptitious observation" design (Kirsch, Silva, Carone, Johnston, & Simon, 1989). When subjects are aware that their behaviour is being observed simulators perform in a similar manner to reals; when unaware of being observed, simulators are less responsive to nontrance-logic suggestions than reals. With no experimenter present to "please," real but not simulating subjects responded to the suggestions.

The various modifications to the real-simulator paradigm seem to converge on an explanation of hypnotic responding which is neither all compliance nor all genuine or unique to hypnosis. Instead it appears that the "genuineness" of hypnotic behaviour lies within involvement in suggestion-related imaginings. The indices of trance logic discriminate the behaviours of real and simulating subjects because the imaginings of the real subjects are often imperfect or

less than real. This does not imply that some hypnotic behaviours are not a function of compliance to demand characteristics; only that the real-simulator paradigm is inadequate to assess the degree to which hypnotic behaviours may be faked. It is likely that alternative paradigms need to be developed which can assess the degree of compliance in hypnotic responding. One such paradigm was recently devised by Spanos, Perlino, Patrick, Bell, & Gwynn (1990).

The Spanos, Perlino et al. Compliance Paradigm

In the tradition of T. X. Barber, Spanos subscribes to the view that the effective variables in hypnotic responding are the subject's motivation and involvement in suggestion-related imaginings. Both Barber and Spanos endorse a cognitive social-psychological model of hypnosis (Barber, Spanos, & Chaves, 1974; Spanos, 1986b; Spanos & Barber, 1974). Like Orne, they have highlighted the importance of demand characteristics, contextual factors and expectations as determinants of behaviour in hypnotic settings. However, Spanos, like Barber before him, rejects the notion that a special or unique process is presumed operating in hypnotic subjects. Spanos has amassed a bulk of empirical support which, from the time of Mesmer and the Royal Commissions, have been largely speculative analyses about the social nature of hypnotic responding.

Much of Spanos' empirical work, like that of Barber, has concentrated on specifying the conditions necessary to produce behaviours which were previously thought to be unique to hypnosis. Much of his research method can be characterized as an interaction design (Sarbin & Coe, 1972). The design essentially involves preselecting subjects for either high or low hypnotizability, and comparing these groups on a variety of instructional conditions in a repeated measures design. Procedural strategies to control for order effects, for example counterbalancing, are often employed in this

design. Typically, subjects base-rate measures of response are taken first and then on subsequent trials subjects are administered suggestions either preceded or not preceded by an hypnotic induction. A final control or baseline trial is often employed to assess any changes over time, in the absence of treatment. Dependent variables have included verbal, behavioural, and physiological indices.

In general, this research indicates that on baseline, low and high hypnotizables report similar levels of experience. However, low hypnotizables given nonhypnotic suggestions report as much experiential change (e.g., analgesia, deafness) as high hypnotizables given either hypnotic or nonhypnotic suggestions. Moreover, low hypnotizable hypnotic subjects report less experiential change than hypnotic or nonhypnotic high hypnotizables. These findings suggest that low and high hypnotizables have the ability to alter their experiences; however, lows fail to engage in the requisite cognitions when the context defines responsiveness in a manner which is not congruent with their self-perceptions (i.e., hypnotizable). These findings have challenged a particularly influential special-process account of hypnosis, namely Hilgard's (1977) *neodissociation* theory, which argues that (a) low hypnotizables are incapable of experiential changes to the same degree as high hypnotizables, and (b) hypnotic procedures facilitate experiential changes over nonhypnotic procedures.

The design favoured by Spanos has been recently extended for the purposes of evaluating the degree of compliance in hypnotic and nonhypnotic responding. Recall that Spanos (1986b) considers that experiential change does indeed occur for hypnotized and nonhypnotized subjects engaged in suggestion-related imaginings. However, he acknowledges the importance of subjects' motivations to maintain the role of a "good subject" as this is defined to them. In doing so, he recognizes that there is not a one-to-one correspondence

between subjects' behavioural responses to suggestions and their underlying subjective experience. His position on whether or not subjects' reports are honest descriptions of their experience has been criticized by some for its apparent failure to consistently treat subjective reports as either always honest, or never honest (P. Bowers, 1986; Kihlstrom, 1986). However, Spanos (1986c) does not view the issue as an either-or one. Instead he endorses the view that under some conditions it is theoretically useful to treat such reports as honest, and under other conditions it is not theoretically useful to do so. The new compliance paradigm developed by Spanos and his associates constitutes an effort to delineate those conditions. The paradigm is intended to assess the degree to which reported changes in experience are biased by compliance to demand characteristics.

Spanos and his associates have employed the interaction or factorial design which characterizes much of Spanos' work (Spanos, Perlini, Patrick, Bell, & Gwynn, 1990; Spanos, Burgess, & Perlini, 1990). Subjects high or low in hypnotizability are randomly assigned to one of four groups. Stimuli (auditory or pain) are presented on each of three trials, and subjects are asked to rate the intensity of their experience 15 seconds following each trial. The first trial is a baseline trial, and the second is preceded by an hypnotic or nonhypnotic suggestion for experiential change (e.g., analgesia or deafness). Following the reports on the intensity of the experience, the suggestion is cancelled and a third stimulus trial is presented without any preliminary treatment instructions. Following the termination of this third stimulus presentation, but before eliciting reports on experience, half of the subjects are administered a brief statement designed to induce compliance (e.g., you probably slipped into hypnosis and felt very little pain on the last trial). The compliance statement is slightly changed for those subjects who received a nonhypnotic suggestion on Trial 2 (e.g., you probably initiated your natural pain-reducing abilities and felt very little pain

on the last trial). The remaining subjects (controls) give their trial 3 intensity reports without receiving any compliance instruction. Note that the compliance instruction and control groups are exposed to the same stimuli and testing procedures (i.e., no preliminary instructions) during the trial itself; the manipulation is instituted **after** the stimulus is terminated and before their reports are elicited. This insures equivalence of experience of the stimulus during the trial; any reported differences in stimulus intensity between these groups necessarily reflects compliance to the experimenter's exhortative statements.

The compliance paradigm discussed above will undoubtedly elicit biased responding from some subjects. Orne's seminal work on demand characteristics has shown us that experimental subjects will respond to a host of cues in the experimental setting that inform them about "appropriate" responding. However, the compliance paradigm is not intended to defame or cast doubt on the authenticity of all subjects' verbal reports in experimental settings. Instead, it seeks to determine which subjects are complying to the inducement and whether these are the same subjects who are responsive to hypnotic procedures. Furthermore, if the biased experiential change reported following the Trial 3 inducement is similar to the reported change following the suggestion procedures, then there are substantive grounds to suggest that reported alterations in experience may reflect a considerable degree of reporting bias rather than subjective alteration. Such a finding would underscore compliance as an integral aspect of hypnotic responding.

The compliance paradigm described above has been employed in several previous studies. It was first applied to examine compliance in the context of hypnotic and nonhypnotic analgesia (Spanos, Perlini, et al., 1990) and later suggested deafness. In the first of these studies, Spanos, Perlini, et al. (1990) found that among high hypnotizables, compliance-induced reductions in reported pain

were substantial and almost as large as suggestion-induced reductions. Moreover, the often-found relationship between hypnotizability and suggestion-induced reductions was eliminated when these reductions were corrected for the degree of bias that subjects showed following the compliance-inducement. In the second study, using suggested deafness, Spanos, Burgess, and Perlini (in press) found results similar to the first. The magnitude of the reported hearing reduction following the compliance-inducement was only slightly (and not always significantly) smaller than the magnitude of suggestion-induced reports. In this study the relationship between hypnotizability and suggestion-induced reductions was not completely eliminated (it still accounted for 5% of the variance) when the reductions were corrected for degree of bias. This indicates that suggestion-induced reporting may involve some combination of actual experiential change, perhaps due to imaginal involvement, coupled with a large component of reporting bias.

In both of the studies that employed this compliance paradigm, it was found that compliant responding was context rather than trait (i.e., hypnotizability) dependent. Although high hypnotizables exhibited reporting biases regardless of the nature of their previous treatment (i.e., hypnotic or nonhypnotic suggestion), only low hypnotizable nonhypnotic subjects responded to the subsequent compliance-inducement. Low hypnotizable subjects responded to a nonhypnotic suggestion and a subsequent compliance-inducement framed in terms of nonhypnotic responding. One hypothesis to account for these findings is that once subjects respond to initial requests to cooperate they attempt to maintain their self-presentation as good subjects, even if such efforts lead them to misdescribe their experiences. The maintenance of the responsive subject role may be managed for the purposes of enhancing self-perceptions, as well as influencing the perceptions of others. Low hypnotizables are unlikely to have interests in presenting

themselves as good hypnotic subjects, and thus they will be recalcitrant to any compliance-inducement framed in terms of hypnotic responsiveness (Jones & Spanos, 1982). In short, the pattern of responding to compliance-inducements mimic that of suggestion inducements, leading to the hypothesis that the suggestion-induced experiential changes may be biased by compliance.

The findings reported above may help clarify the discrepancies reported earlier in this report with respect to objective (e.g., delayed auditory feedback) and verbal report indices of hearing. Recall that despite subjects' testimony of deafness following hypnotic suggestions, objective indices provide no support for such experiential change. In light of the findings with the compliance paradigm, it is possible that these subjective reports are biased by compliance. Similarly, discrepancies between autonomic indicators (e.g., GSR, heart rate, blood pressure) and verbal reports of pain may reflect verbal reporting biases (Sutcliffe, 1961; Wagstaff, 1981). Certainly, these findings strongly suggest that verbal reports, contrary to the belief of some (Hilgard, 1969; Zamansky, 1989), are not isomorphic representations of subjective experience.

The compliance paradigm of Spanos and his associates improves upon the shortcomings of Orne's (1959) real-simulator paradigm in a number of ways. First it does not confound subject and treatment variables as does Orne's paradigm. Instead both high and low hypnotizable subjects are included in the control procedure intended to elicit compliance. A second added improvement is that it employs repeated measures procedures which serve to increase the power of the design to detect small differences between performance on each trial (individual differences variance is reduced). Spanos' design, like Orne's design, allows comparisons of compliance between groups; however, in addition, Spanos' paradigm also allows the comparison of performance within subjects; that is, it allows one to

evaluate whether the subjects who report high levels of experiential change in one instance are the same subjects who report experiential change in other instances. Given that individual subjects are more consistent over time than different subjects measured at intermittent times (the virtue of a within compared to between-groups design), Spanos' paradigm permits much stronger inferences about compliance than Orne's real-simulator paradigm.

A fourth advantage of this new paradigm is that it satisfies the stringent requirements of a control procedure, which as discussed earlier, Orne's simulating condition does not; that is, all factors other than the manipulated variable are held constant. During the third trial, the stimulus and testing procedures are the same for the groups that receive the compliance instruction and for those that do not. Consequently, there is no reason to believe that the experience of loudness or pain at the termination of the trial is different between these groups; any differences must be the result of the manipulation following the experience.

A final advantage of the Spanos compliance paradigm, compared to Orne's paradigm, lies in its utility for evaluating the degree of compliance in hypnotic responding. The issue here is both a methodological and a theoretical or assumptive one. Orne assumed a unique property to hypnosis, and thus whether behavioural similarities or differences emerged between his reals and simulators, he was never willing to infer that behaviours following hypnosis were evidence of compliance. It is doubtful that, even without his a priori assumptions, a strong inference could be made about compliance versus genuine responding. After all, his was a between groups design, and an argument could be made that different subjects who behave similarly, are doing so for different reasons. Spanos, on the other hand, does not carry such an assumption. Like Barber before him, Spanos prefers to identify those conditions which may elicit behaviours traditionally labelled as hypnotic. With such an

approach, a simple instruction from the experimenter about what is considered appropriate responding may elicit reports of experiential change which resemble those following hypnotic procedures. This theoretical account does not adjust itself ad hoc nor is it burdened by nonfalsifiable constructs and assumptions about unique properties of hypnosis. Of course, Spanos can be criticized like Barber, on the grounds that similar behaviours do not imply similar mechanisms; however, Spanos and his associates, in contrast to Orne, have employed a within-subjects factor in their design. This allows for stronger inferences about compliant responding insofar that the subject who responds in the same manner on two separate occasions is more likely to do so for the same reason. The reasons, of course, are not foreign to Orne who played a major role in highlighting the motives for compliance in experimental settings.

Methodological Convergence

The preceding overview has outlined the historical antecedents of a compliance interpretation of hypnotic responding, a number of nonbehavioural strategies for evaluating compliance, and three distinct behavioural paradigms for evaluating compliance in hypnotic responding. Each of the latter methods has made contributions to our understanding of hypnotic responding. The recent compliance paradigm of Spanos and his associates and Orne's real-simulator paradigm have been particularly important in addressing the issue of compliance, and as discussed above, the Spanos paradigm provides increased confidence in the inferences one may draw about the degree of compliance in hypnotic settings.

Compliance has been associated with hypnotic behaviour since the time of Mesmer. It is an issue which might be better elucidated through a cross-paradigm analysis. The real-simulator paradigm has been chosen as a preferred strategy of evaluating compliance in

hypnotic settings and the findings here have spawned a great deal of theorizing about the nature of hypnotic responding. However, this paradigm has focussed on mean differences between reals and simulators on trance-logic indices or so-called compliance discriminating tasks. What Orne (1979) has ignored is the substantial variability amongst the reals on these tasks in terms of whether they show trance logic responding (e.g., frequency of transparency, duality, and incongruous writing). One principal issue is, what is this variability due to? One hypothesis is that this variability is due to the extent to which some hypnotic reals are biasing their responses. Specifically, if some reals are biasing their responses more than others, then one would expect that those reals who behave most like simulators (e.g., report solid, vivid images) are the same subjects who will show strong biased responding when invited to comply. The purpose of these studies is to determine whether this variability in responding amongst highs is due to efforts to comply. The present proposal, then, is an attempt to extend previous work on the variability of reals and relate it to incomplete responding and compliance. Such an approach will allow an evaluation of the validity of the inferences drawn from the real-simulator paradigm; namely, that differences between real and simulating groups reflect a property (a) uniquely present in hypnosis and characterized by incongruous logic, and (b) not accountable by pressures to comply with experimental demands.

Present Study

The research reviewed earlier on the real-simulator paradigm indicates that reliable real-simulator differences occur on three indices of trance logic: (1) transparency responding during visual hallucinations, (2) incongruous writing during age regression, and (3) duality experiences during age regression. Furthermore, low

hypnotizable and high hypnotizable simulators respond similarly to one another, but different from high hypnotizable reals (i.e., nonsimulators), on these three indices. Taken by themselves, high hypnotizable reals exhibit much variability in trance logic responding: some show it and others do not.

The first session of the present study compared three groups of subjects on a visual hallucination and age regression suggestion. In addition, a pseudomemory suggestion was included since response to this index has been variously interpreted as either reporting bias or genuine hypnotic behaviour. Three groups of subjects were compared: (1) high hypnotizable real hypnotic subjects, (2) high hypnotizable simulators, and (3) low hypnotizable simulators. The groups were administered each suggestion preceded by an hypnotic induction procedure. The regression and hallucination responses will be scored for trance logic using a two-step process. Subjects were first scored for whether they accepted (pass) or did not accept (fail) the suggestion. For example, subjects were scored as passing the age regression suggestion if they reported they were 5 years old when the experimenter asked their age, or in response to an hallucination suggestion reported seeing the hallucinated object when the experimenter asked them about what they saw. Only subjects who passed these suggestions were scored for duality and incongruous writing (age regression), as well as transparency (visual hallucination). During age regression, a report of feeling simultaneously or in alternative both adult and child was scored as a duality report. The hallucination response was considered transparent if subjects responded affirmatively to the question "Can you see the curtain through the toy?" This procedure circumvents the problem of a low rate of spontaneous avowals of transparency.

Subjects' responses were audiotaped for transparency and duality, as well as incompleteness (i.e., number of qualifiers and descriptors). The interview procedure followed that of Sheehan,

McConkey, & Cross (1978), known as the Experiential Analysis Technique (EAT). Following this interview, subjects rated the subjective intensity of each suggested response (i.e., credibility, absorption and vividness).

Subjects returned for a second session to participate in the Spanos, Perlini et al. (1990) compliance paradigm, which involved the administration of three auditory trials to each subject. The first trial served as a baseline and the second trial was preceded by an hypnotic suggestion for deafness. Following cancellation of the suggestion and the trial 2 auditory reports, all subjects were administered the third trial without preliminary instructions. Following this trial, but before giving their auditory report, 31 reals and 11 simulators were administered a compliance instruction. The remaining 11 reals and 11 simulators received no instruction between termination of trial 3 and their pain report.

Experimental Hypotheses: On the basis of previous findings it was hypothesized that low and high hypnotizable simulators will not differ in the number of suggestions passed or on the incidence of trance logic. However, these groups were expected to pass more suggestions than reals, as well as show more trance logic responses; namely duality during age regression and transparency during visual hallucination. Moreover, simulators were expected to be more likely to pass the pseudomemory suggestion than reals. Hypnotic subjects passing the pseudomemory suggestion were expected to report this experience as more subjectively compelling than those who failed this suggestion.

On the basis of previous findings in support of the differential demands hypothesis (e.g., Spanos et al., 1987; Stanley et al., 1986) it was hypothesized that simulators would describe their experiences as more believed-in than real hypnotic subjects. Furthermore, simulators were also predicted to describe their suggested

experiences as more complete or lifelike, compared to real hypnotic subjects. Among hypnotic reals, we anticipated that those responding to the trance logic indices would report less subjectively compelling experiences than those who do not respond. Orne's (1979) logical incongruity hypothesis predicts that subjects reporting trance logic would report more subjectively compelling experiences.

Overall, although it is hypothesized that there will be mean differences between reals and simulators on so-called trance-logic indices, it is also predicted that there will be substantial variability amongst the reals, but not simulators, in terms of whether they show trance logic responding (e.g., frequency of transparency, duality, and incongruous writing). One principal issue as yet unaddressed revolves around the reasons for this variability. One hypothesis is that this variability is due to the frequency with which hypnotic reals are biasing their responses. Specifically, if some reals are biasing their responses more than others, then one would expect that those reals who behave most like simulators (e.g., fail to show trance logic responses) should be the same subjects who show strong biased responding when invited to comply.

Spanos, deGroot and Gwynn (1987) propose that trance logic responses will differentiate reals from simulators when these responses also tap incomplete responding. According to this hypothesis, incomplete responses generally reflect honest reporting. One prediction from this hypothesis is that incompleteness indices, in contrast to trance logic indices, will be a stronger predictor of compliance to experimental demands.

Method

Subjects

Sixty-four Carleton University undergraduates volunteered to participate in a two-session experiment on hypnosis and perception in fulfillment of course requirements. All subjects had previously been pretested on the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos et al., 1983), and fifty-two had obtained objective hypnotizability scores (CURSS: O) in the high range (5-7) and 12 had obtained CURSS: O scores in the low range (0-2).

Measures

Orne (1979) recommends a multiple hypnotizability screening procedure for ensuring that trance logic is characteristic of highly hypnotizable subjects. Evidence, however, indicates that high hypnotizable subjects screened on one compared to two hypnotizability tests do not differ on the incidence of trance logic (Stanley et al., 1986).

CURSS. The CURSS is a 7-item instrument for assessing responsiveness to hypnotic suggestions. The items include two ideomotor suggestions (arm levitation, arms moving apart), two motor challenge suggestions (arm catalepsy, arm immobility), and three cognitive suggestions (auditory hallucination, visual hallucination, amnesia for all preceding suggestions). Unlike most hypnotizability scales, the CURSS can be administered to subjects individually or in group settings, and requires subjects to score their own responses during the 45-minute administration. Self-scoring and experimenter-scoring of the CURSS: O dimension correlate highly ($r = .87$; Spanos, Cobb, & Gwynn, 1984).

The CURSS provides three indices of response to hypnotic suggestions. The primary index and that used by all hypnosis researchers as the index of response is the degree of overt response to suggestions (CURSS: O), which ranges from *no suggestions passed* (0) to *all suggestions passed* (7). A second responsivity index assesses the degree to which these suggestions are experienced as subjectively compelling (CURSS: S), and ranges from *no subjective experience* (0) to *high subjective experience* (21). A third index assesses the degree to which each suggestion objectively passed was experienced as primarily involuntary (CURSS: OI). This latter index ranges from *no suggestions passed and rated as involuntary* (0) to *all suggestions passed and rated as involuntary* (7). Responses to suggestions that felt more voluntary than involuntary would be reflected by O/OI discrepancies, of which approximately half of test-items qualify (Spanos et al., 1983a, 1983b, 1983c). Though some researchers (e.g., Kihlstrom, 1985) have argued that this O/OI discrepancy reflects overt behavioral compliant responding on the CURSS, it has been demonstrated (e.g., Spanos, Lush, Smith, & deGroh, 1986) that these discrepancies characterize other inductions and hypnotizability scales (e.g., SSHS: C; Weitzenhoffer & Hilgard, 1962).

The construct validity and test-retest reliability of the CURSS is acceptable. Over periods ranging from 2 weeks to 3 months, the test-retest reliabilities for the three CURSS dimensions range from 0.67 to 0.74 (Spanos et al., 1983a), and within one to seven days these reliabilities range from .67 to .84 (Spanos, Cobb, & Gwynn, 1984). Research using other similarly designed scales such as the HGSHS and SSHS: A indicates that hypnotizability scores remain relatively stable over periods between 8-12 years (r 's = 0.55 - 0.60; Morgan, Johnson, & Hilgard, 1974; Gwynn, Spanos, Gabora, & Jarrett, 1988). The CURSS also correlates as well with the SSHS: C (r = 0.65) and HGSHS (r = 0.62; Spanos et al. 1983) as these scales correlate with each other (e.g., HGSHS and SSHS: C, r = 0.60). Scale differences have been attributed

to the relatively large number of difficult (cognitive) items on the SSHS: C (Evans & Schmeidler, 1966). Item difficulty bears on the issue of discriminant validity, where the CURSS has been shown to be a more stringent index of hypnotizability than what was heretofore considered the most difficult hypnotizability scale, the SSHS: C. On average, subjects are less likely to pass CURSS suggestions than SHSS: C suggestions (Spanos, Salas, Menary, & Brett, 1986). In short, the psychometric properties of the CURSS qualify it as both a reliable and valid means of assessing hypnotizability.

Subjective Experience Rating Scales. Following each hypnotic suggestion in session 1, subjects were administered a series of Likert-type scales (see Appendix 6-8) assessing the degree to which they had (a) believed in the reality of the suggested experience, (b) were absorbed in the suggested experience, and (c) vividly imagined the suggested imaginings. The alternatives ranged from *not at all* (0) to *a great degree* (7). In the second session, subjects rated the intensity of the auditory tone on a 21-point category scale taken from Spanos, Burgess, and Perlini (1990) with scale alternatives that ranges from *no sound* (0) to *intensely loud* (20). Subjects were also required to rate the degree to which they employed cognitive strategies on the third trial on a 7-point scale with scale alternatives that ranged from *no strategy use* (0) to *all the time* (7).

Personality Questionnaires. Immediately before hypnotizability testing, subjects were required to rate their vividness of mental imagery. The *Vividness of Mental Imagery Scale* was developed by Shor, Orne, and O'Connell (1966) and is a 15-item version of the Bett's (1909) Imagery scale (see Appendix 17). The VMI assesses imagery vividness in various sensory modalities, primarily visual. The VMI items were scored on a 7-point scale, where "1" represented "perfectly clear, as real as the actual experience", and points 2 to 7 represented decreasing degrees of vividness (e.g., "7" represented "no image present at all, you only *know* that you are

thinking about it). Other personality measures were administered prior to the second session. These include: the ABS or absorption subscale of the Differential Personality Questionnaire (Tellegan, 1982), the Crowne-Marlowe Social Desirability Scale (CM; Crowne & Marlowe, 1960), and the Concern for Social Appropriateness Scale (CSA; Lennox & Wolfe, 1984). The 34-item TAS assesses the degree of sustained, "noncritical" attention invested when engaged in such everyday activities as daydreaming, watching a movie, reading a novel, observing a sunset, etc. The items were scored on a four-point scale where the value "1" represented *never*, "2" represented *seldom*, "3" represented *sometimes*, and "4" represented *very often*. The CM Social Desirability Scale contains 33 behaviors which are culturally sanctioned and have minimal pathological implications but which are improbable of occurrence, similar to the Lie scale of the MMPI (Meehl & Hathaway, 1946). The CM scale is moderately correlated ($r = .54$) with the Lie scale of the MMPI. The scale is believed to assess the need of persons to obtain approval by responding in a culturally appropriate and acceptable manner. Of the 33 items, 18 are keyed true and 15 false, making a response set interpretation of scores highly improbable. The 20-item CSA scale is comprised of seven items assessing *cross-situational variability* and thirteen items tapping *attention to social comparison information*. Taken together, these subscales assess long-term (1 year or more) tendencies to conform (i.e., to avoid behaviours that depart extremely from the quantitative norm of a reference group). Each item is scored from 0 (certainly, always false) to 5 (certainly, always true), with higher scores indicating a greater tendency to conform.

Auditory Stimulus. A thirty second pure tone at an intensity of 60 decibels and a frequency of 1000 Hertz was prerecorded on a Sony HF Normal Bias cassette tape. The tone was recorded three times, one for each trial in the second session. The tone was presented biaurally on Sony DR-Z7 headphones via a Phillips D8270

tape recorder. To avoid ambient noise, a testing chamber was chosen that was a considerable distance from traffic and staff offices.

Visual Stimulus. A small stuffed toy duck, called Admiral Bird (manufactured by Gund) served as the visual stimulus which subjects were required to visually hallucinate. The toy duck has several distinguishing characteristics which include a dark brown leather aviator cap, aviator goggles, light brown furry bodice, beige leather beak, green leather webbed feet, a black underside to its wings, and clear plastic eyes with black pupils. The toy, naturally leaning to its left side, sat on the corner of the desk directly in front of a green and yellow floral curtain. While the subjects eyes were closed, just prior to the hallucination suggestion, the toy was moved by the experimenter to a stool behind the subject. To promote a more ideal condition for creating the hallucination response, the testing room was illuminated by a 60 watt desk lamp placed on top of the desk but directed away from the subject. The overhead florescent lights remained off for the duration of the experiment.

Procedure

Within the highly hypnotizable group, subjects were randomly assigned to either the real ($n = 42$) or simulating treatment conditions ($n = 10$). The twelve low hypnotizable subjects were all assigned to the simulating condition. In total, there were 10 high susceptible simulators and 12 low susceptible simulators.

Real and Simulating Conditions. Upon arrival at the laboratory, all subjects were greeted by a male assistant who was aware of their hypnotizability level. Subjects were escorted to a nearby waiting room and informed that the experiment would be run in two back-to-back sessions. Following an initial rapport-building discussion, subjects were told that the first one-hour session would involve three hypnotic suggestions for altered perception that resembled

those of the earlier hypnotizability test. Subjects were told that the second session involved the presentation of three auditory tones of short duration under varied experimental conditions. The initial instructions were intentionally brief and ambiguous to avoid the potential dangers of subjects developing a priori expectancies and strategies for responding. Subjects were advised that the experimenters in each session were competent and senior level graduate students working on their theses. The forty-two high hypnotizable subjects assigned to the *Real-Hypnosis* condition were encouraged to discuss their previous hypnotic experiences (or any other experiences they chose) for about five minutes. The remaining 22 subjects (12 low hypnotizable and 10 high hypnotizable subjects) were given the following instructions to comprise the *Simulating* condition.

The ten low-hypnotizable subjects were administered detailed simulating-instructions adapted from Orne (1979; see Appendix 1). These subjects were informed that they were part of a special group whose task it was to fake being an excellent hypnotic subject for the sake of fooling the experimenters. Subjects were (accurately) informed and assured that the experimenter knew of the presence of both a real and a simulating group but was unaware of which subjects were assigned to what group. Subjects were told that previous research revealed that, though difficult, their task could be successfully managed through reliance on situational cues and experimenter expectations communicated in the instructions. Subjects were told that the experimenters in each session would stop the proceedings if faking was suspected and that in the absence of this suspicion, their performance reflects that of an excellent hypnotic subject. In no way, implicitly or explicitly, were simulators told how an excellent hypnotic subject would behave. These subjects were explicitly told to answer all verbal and written requests, as well as questionnaires in the manner in which an excellent hypnotic

subject would respond. Moreover, they were told to not let themselves become hypnotized, engage in the suggested imagery, or feel any of the suggested effects. This performance was to continue throughout both sessions and until the completion of the second session, at which point they would be brought back to the assistant. Only at this point, in the absence of the two experimenters, would the subject stop faking and discuss their experiences during the simulation. Following these instructions, each subject was required to reiterate the nature of their simulating task in order to ensure that they clearly understood what was required from them.

To achieve uniform treatment of all simulating subjects, the ten highly hypnotizable subjects assigned to the *Simulating Condition* received instructions identical in all but one respect with those used with the low hypnotizable group (see Appendix 1). These subjects were told that highly hypnotizable subjects like themselves, by drawing on their past experiences and experimental cues, are capable of simulating hypnosis without becoming hypnotized; that their task was to simulate this role without becoming hypnotized, engaging in the suggested imagery, or feeling any of the suggested effects; and that their experience should be more apparent than real. In all other respects, these subjects were treated identically to the low hypnotizable simulators. Note that simulators were made aware of the presence of a *Real Hypnosis* treatment group; however, the Real Hypnosis group was not made aware of the presence of the *Simulating* group. On Orne's (1971) suggestion, this procedure serves to enhance motivation and task-purpose for the simulators without invoking suspicions against genuine responding in real subjects.

Following these preliminary instructions and subjects' confirmations that they understood their task, the assistant escorted the subject to another laboratory, wherein he introduced the subject to the principal experimenter.

Session 1. Following an initial rapport-building discussion, the principal experimenter explained that the first session would involve three suggestions designed to assess varied hypnotic responses. Subjects were informed that both verbal and written testimony on their experiences would be required. To ensure the accuracy of response, the experimenter requested the subject's permission to audiotape their responses. Pending their informed and written consent (see Appendix 2), subjects received a 10-minute hypnotic induction procedure modified from Barber (1969; see Appendix 3). Subjects were then administered the three hypnotic suggestions in the following order: (1) pseudomemory (modified from Laurence & Perry, 1983), (2) age regression to age five (modified from Laurence, 1979), and (3) visual hallucination (modified from Peters, 1973; see Appendix 4). Each hypnotic suggestion was cancelled before the ensuing hypnotic suggestion (see Appendix 5). During this period between suggestions, the subjects were interviewed using a modification of Sheehan et al.'s (1978) EAT procedure. Also during this interim period, subjects were administered the three Likert-type scales assessing the degree to which they had (a) believed in the reality of the suggested experience, (b) were absorbed in the suggested experience, and (c) vividly imagined the suggested imaginings (see Appendices 6-8).

The modifications to the EAT procedure were necessary due to practical considerations; namely, to keep the length of experimental sessions within a time frame that would not bring about fatigue and boredom in the subject. Unlike Sheehan et al.'s interview medium, our interview was not conducted using subjects' videotaped performance as a means of assisting recall of their experiences. Since this videotaped procedure is normally conducted following the experiment proper, it could be argued that any alleged improvement in recall is simply due to subjects' efforts to construct a coherent experience; consequently, the strategy used here was to interview

subjects on the nature of their experience immediately following cancellation of the suggestion, thus reducing the amount of time from experience to recall. Since memory for events and experience is known to fade over time, it was felt that this immediate interview procedure was as accurate as any post-hoc videotape procedure.

Upon completing the EAT interview and subjective experience questions about the visual hallucination suggestion, the subject was told that a second experimenter would be escorted back within five to six minutes. In the meantime, they were required to complete a battery of three personality questionnaires which were standard procedure in the laboratory. None of these questionnaires were labelled. The questionnaires included the Absorption, Social Desirability, and the Concern for Social Appropriateness scale (see Appendices 14-16). The session ended with the experimenter greeting and thanking the subject.

Session 2. Upon their return to the laboratory, the first experimenter (A.P.) introduced the second experimenter (R.G.) to the subject, and then left. Following an initial rapport-building discussion, the experimenter explained that the second session would involve three auditory trials requiring subjects to give loudness ratings after the termination of each tone. These ratings were to be given when the experimenter tapped the back of the subject's hand (10 seconds after stimulus termination). Following the explanation of the rating procedure (see Appendix 9), subjects were required to offer their informed consent to proceed with the experiment (see Appendix 10). Subjects were then requested to close their eyes and were presented with the baseline auditory test trial. Immediately following their loudness rating, subjects were administered a 10-minute hypnotic induction procedure modified from Barber (1969; see Appendix 3). This was followed by a 45-second deafness suggestion taken directly from Spanos, Burgess, and Perlini (1991;

see Appendix 11). This suggestion informed subjects that hypnosis would enable them to use their imaginal and attentional processes to control sensory input, and that on the next trial they were to use these abilities to reduce the loudness of the tone. Following completion of trial 2 (after subjects gave their loudness ratings), the suggestion for deafness was cancelled and subjects were "awakened" from hypnosis.

The third trial was preceded with the instruction that this last trial would be "just like the first trial." In the 10 seconds after the presentation of the trial 3 tone but before they made their loudness ratings, 31 of the high hypnotizable reals, 5 high hypnotizable simulators and 6 low hypnotizable simulators received an instruction (see Appendix 12) which explicitly defined what constituted an appropriate experience on the last trial. Specifically, subjects were told that:

People who are exposed to the tone more than once tend to drift back into hypnosis, and this greatly reduces the intensity of the sound that they hear. You probably drifted into hypnosis on this last trial and, for this reason, heard very little of the tone.

The remaining subjects (11 high hypnotizable reals, 5 high hypnotizable simulators, and 6 low hypnotizable simulators) did not receive this instruction during the 10-second interval between the end of trial 3 and the making of their intensity rating. This condition allowed assessment of any uninvited reporting biases or transfer of distraction strategies across trials. In total, 64 subjects were required to complete the two sessions: the *Compliance* condition contained 42 subjects and the *No-Compliance* condition contained 22 subjects. Following this final intensity rating, subjects were required to rate the degree to which they employed cognitive strategies on the third trial on a 7-point scale (see Appendix 13). The scale alternatives that

ranged from *no strategy use* (0) to *all the time* (7). Upon completing the second session, the experimenter left the room, at which point the original assistant entered to conduct a post-experimental interview. This interview served to provide an opportunity for subjects to discuss their experiences and receive debriefing about the purpose of the experiment (see Appendix 18). Finally, subjects were thanked for their participation and remunerated with course credit for their participation.

Experimental tests

During the first test session, subjects received three hypnotic suggestions. All three suggestions were first scored for whether the suggestion was accepted (passed) or not accepted (failed). The age regression and visual hallucination suggestion were also scored for a trance logic response, if subjects initially passed the suggestion. *Duality* and *incongruous writing* served as trance logic indicators for the age regression suggestion and *transparency* and *double hallucination* were scored as indicators for the visual hallucination suggestion.

Pseudomemory. The pseudomemory suggestion was taken verbatim from Labelle, Laurence, Nadon and Perry (1990). Subjects were asked to select an evening in the previous week in which they could remember the activities in the half hour or so before going to sleep. After describing the evening, subjects were then asked the time at which they had fallen asleep that night and the time at which they had awakened the next morning. Subjects were then asked whether they slept through the night with no memories of dreams or having awakened. If the latter conditions were not met, subjects were required to select a night for which they recalled the activities before going to sleep but not after falling asleep. Once such an evening was chosen, subjects were administered a 10-minute

hypnotic induction procedure (modified from Barber, 1969) followed by suggestions to "age regress" to their previously selected night and "relive" that night. They were again asked to describe their activities during that evening. Once they reported falling asleep, the experimenter suggested a rapid time progression to four o'clock a. m. that night. The subjects were then told " *It is now 4 a.m. I want you to tell me whether you hear some loud noises, some loud noises that may sound like backfirings of a car or a door slamming, some loud noises. Tell me whether you hear them?* " If subjects did not report hearing the noises, they were prompted a second time with the following instructions: " *Alright, just attend carefully. Now tell me it's around 4 o'clock, tell me whether you become aware of them now?* " If they reported hearing the noises, the subjects were asked a series of questions to allow them to elaborate on their memories (i.e., *Do they wake you up?, Perhaps you look at your clock and see what time it is. Tell me what the noises sound like?, How many noises do you hear?, Are you getting out of bed?, and Do you think they might be important?*).

Regardless of whether or not subjects reported the noises, the item was terminated with the following instructions: " *Your mind works like a tape recorder and has probably recorded that information. Later on, when you will be out of hypnosis again and you think about that particular night you will remember everything that happened on the night.* " After this instruction, subjects were age-progressed to the present day and then administered a standard "wake-up" procedure. All subjects were asked to describe the evening in question, including the time at which they fell asleep and awakened the following morning. They were then asked: " *Did you hear any noises during the night?* " If subjects answered "yes", they were asked to describe the noises. They were then asked to rate their belief in, absorption in, and vividness of, their subjective experience.

Age Regression. This suggestion was modified from that of Peters (1973) and Laurence (1979). Following hypnotic induction, subjects received repeated suggestions that they were becoming younger and younger, until they were age regressed to the age of 5. Subjects were then asked "*How old are you?* ", as well as a series of questions that allowed them to elaborate on their experience (i.e., *What do your friends call you?*, *Are you going to school yet?*, *Have you learned to write your name?*, *Can you print your name?*). With their eyes still closed, subjects were told that a pencil and paper were being placed on the desk in front of them, and that they would be required to write (or print) several things. Subjects were told to open their eyes, pick up the pencil and write down their *name* ; having completed this task, subjects were told to write down their *birthday*. Their final task was to write the sentence "*I am participating in a psychological experiment.* " Following this exercise, subjects were again asked to close their eyes, and then age-progressed to their present age. Hypnosis was then cancelled and subjects were required to write their name, birthdate, and the test sentence (cited above). Following this, subjects were queried about their experience (EAT) with the following questions: *Can you tell me what you experienced when I gave you the suggestion that you were five years old again? Did you really feel like you were five years old? Did you have any sense of your adult identity?*

Subjects were scored as passing the age regression suggestion if they reported that they were 5 years old when the experimenter asked their age. Those who passed the suggestion were further scored on two indices of trance logic: (1) incongruous writing, indicated if subjects failed to exhibit any changes in the spelling of three key words: *participating*, *psychological*, or *experiment*, and (2) duality, indicated if subjects reported having felt like both a child and an adult either simultaneously or in alternation. Those who passed this suggestion were also scored for incomplete responding.

reflected by any failure to experience suggested effects completely when asked during the interview whether they had really felt five years old. Responses that qualified as incomplete include: "partially", or "at times or certain points", or "on and off." etc. A second incompleteness index

Visual Hallucination. Prior to this suggestion, subjects were asked, open-endedly, to describe what they saw in the room. If the subject failed to notice the toy duck, it was pointed out by the experimenter. The toy was positioned directly in front of the subject on the corner of the desk, behind which the experimenter sat. All subjects were advised to take a close look at the toy and asked to describe it. Following this description, subjects were asked to close their eyes and they were orally administered an hypnotic induction. While the subjects eyes were closed, the experimenter quietly moved the stuffed toy to a stool to the left and slightly behind the subject. The stool was positioned so that subjects could not see the toy peripherally when they opened their eyes. Subjects were then instructed to slowly open their eyes and look at the desk directly in front of them. As they did so, the experimenter repeatedly suggested to subjects to vividly imagine the stuffed toy on the corner of the desk, in front of the curtain. The suggestion included repeated statements that the image of the toy was becoming more and more vivid and clear, and as it did so, the index finger on their right hand would gradually rise. When the subject's finger was fully extended upward, subjects were told to concentrate on the toy and study it carefully. They were then asked to describe the toy in detail. This statement was followed by a series of specific queries about the hallucinated toy. For example, "What material would you say the cap is made of" and "How would you describe the colour of its feet"? During the inquiry, the subject was told that the toy was leaning over to one side, and instructed the subjects to set it upright. Subjects were provided with another opportunity to describe the toy in as

much detail as possible, and finally to describe the location of the toy. A "pass" to this suggestion was indicated if subjects lifted their finger 3 cm or more when the experimenter suggested that their finger would rise accordingly.

Once subjects described the location of the suggested toy, the experimenter pointed to the actual toy and asked: "What is this"? If subjects looked back and forth between the actual and suggested toy, they were scored positively on the **double-take** index. If subjects correctly identified the toy, they were asked "Can you explain"? Subjects were then asked: "Can you compare the two toys and tell me how they are the same and how they are different"? This latter statement was included to provide an opportunity for subjects to describe the relative characteristics of the two toys (e.g., solid vs transparent). If subjects' descriptions during this inquiry included seeing the actual toy and the hallucinated toy simultaneously, subjects were scored positively on the **double hallucination response**. The suggestion was then cancelled and subjects were administered a wake-up procedure. Subjects were then interviewed with the following questions: (1) Can you tell me what you experienced when I asked you to visualize the toy duck? (b) Could you see the curtain through the toy? (c) Can you tell me why you said there were two toys? If subjects' descriptions included the phrases "transparency," "can see through the toy," or "see only the outline of the toy", then they were scored as having shown **cued transparency**.

Incompleteness Ratings of Subjects' Protocols

The principal investigator and his associate rated subjects' protocols independently and in a blind fashion for incompleteness. Only the age regression and visual hallucination protocols were rated on each of two incompleteness indices: (1) number of qualifiers, and

(2) number of fine details, in the phenomenological report. Qualifiers included words such as *sort of*, *almost*, *kind of like*, *similar to*, *I guess it was* ; that is, words which qualify the nature of the experience as somehow not complete. Enumerating the descriptors consisted of counting the number of details recounted by subjects on their experience. These might include such things as the colours, textures, materials of the various parts of the duck or the different experiences encountered while age regressed. The inter-rater reliability of the four indices were: (1) age regression qualifiers ($r = 0.935$); (2) age regression descriptors ($r = 0.968$); (3) visual hallucination qualifiers ($r = 0.945$), and (4) visual hallucination descriptors ($r = 0.914$). These reliability coefficients are considered high and acceptable in behavioural research. Discrepancies were resolved through discussion.

Results

Passing Suggestions. A one-way analysis of variance (ANOVA) comparing the total number of suggestions passed by subjects in the three groups was significant, $F(2, 61) = 3.29, p < .05$. Post hoc comparisons among the means, listed in Table 1, used the Tukey-Kramer adjustment for unequal n 's and indicated that high and low simulators exhibited no significant differences in the number of suggestions passed. However, both simulating groups passed significantly more suggestions than the hypnotic real group.

Chi-square analyses comparing high and low susceptible simulators in their frequency of passing each of the three suggestions revealed no differences (all p 's $> .10$): all 22 simulating subjects passed the age regression suggestion (reported oneself as being at the regressed age) and visual hallucination suggestion (signalled that they could see the suggested figure). Though not all simulators passed the pseudomemory suggestion (only 16 of 22), there were no differences between high and low simulators on this response: $\chi^2(1) = 1.49, p > .10$. In order to enhance power, the two groups of simulators were combined and compared with the reals in their response to each suggestion. These results are presented in Table 2. Chi-square analyses indicated that reals were significantly less likely than simulators to pass the pseudomemory suggestion. Reals and simulators failed to differ in their rate of passing the age-regression or visual hallucination suggestion. Since the pseudomemory suggestion yielded a different pattern of responding than the remaining two suggestions, all subsequent analyses will be conducted separately for this suggestion.

2

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

Table 1. Means and standard deviations for the total number of suggestions passed per group.

Group	Mean	S.D.
High-susceptible real	2.071 _a	0.867
High-susceptible simulator	2.600 _b	0.516
Low-susceptible simulator	2.583 _b	0.515

Note: Between-row means sharing a common subscript fail to differ at $\alpha = .05$.

Table 2. Number of subjects per group passing each suggestion.

Item	Reals	Simulators	χ^2	p
Pseudomemory			3.700	< .05
Yes	20	16		
No	22	6		
Regression			1.081	n s
Yes	40	22		
No	2	0		
Hallucination			1.650	n s
Yes	39	22		
No	3	0		

Pseudomemory. Table 2 and Figure 1 indicate that 20 of the 42 (47.6%) real hypnotic subjects reported hearing noises during an evening they previously described as hearing none. This result replicates those of Laurence & Perry (1983), Labelle, Laurence, Nadon, and Perry (1990), McCann and Sheehan (1988), and Spanos and McLean (1986), who report rates of 48%, 45%, 45%, and 33% respectively--indicating that pseudomemory reports reflect a reliable phenomenon across laboratories and hypnotizability-screening instruments.

During the posthypnotic interview, 16 of the 20 reals (i.e., 80%) maintained that they had actually heard the noises on the night in question. A similar proportion of simulators (14 of 16, or 87.5%) maintained their earlier testimony during the posthypnotic interview. There was no difference in the proportion of reals and simulators who maintained their earlier testimony, $\chi^2 (1) = 0.36, p > .10$. Thus, although subjects were given an opportunity to acknowledge that their earlier hypnotic testimony had been inaccurate, the large proportion of both real and simulating subjects did not recant their initial hypnotic testimony.

Pseudomemory reports have been variously interpreted as genuine memory creations or simple compliance to experimental demands. Both interpretations predict that subjects who report pseudomemory should report more compelling subjective experiences than subjects who do not show this response. Analyses (see Table 3 and Figure 2) indicate that real hypnotic subjects who reported hearing the noises during the hypnotic suggestion reported greater belief, more absorption, and more vivid details than real hypnotic subjects who did not respond to the suggestion.

Table 3. Mean rating on Subjective Experience Questionnaire for Real Hypnotic subjects on Pseudomemory.

Experience	<u>Pseudomemory</u>				t(40)
	Pass		Fail		
	M	SD	M	SD	
Belief	5.80	0.83	1.64	1.47	11.16
Absorption	5.65	0.75	2.77	2.14	5.71
Vividness	5.70	1.22	2.46	1.87	6.59

Note: All t-values significant at .0001.

To test the hypothesis that suggestion-induced pseudomemories alter hypnotic subjects' beliefs in the reality of the suggestion, the belief ratings of the 16 real hypnotic subjects were compared with those of the 14 simulators who maintained posthypnotically that they had heard the noises. The real hypnotic subjects did not have stronger beliefs ($x = 5.75$, $s.d. = 0.86$) than the simulators ($x = 6.00$, $s.d. = 0.56$), [$t(28) = 0.933$] in the reality of the suggestion.

The detailed descriptions of the noises given by the 20 real subjects varied widely and included both ambiguous (e.g., big bang, sharp/loud sound) and specific noises (e.g., door slamming, car backfiring, knock on door, radio noise, dog barking or cat purring). Thus, not all subjects who reported pseudomemory accepted the suggestion exactly (i.e., door slamming or car backfiring); 40% (i.e., 8 of 20) of the real hypnotic subjects assimilated or translated the hypnotically suggested noise into a distinctive and idiosyncratic memory report (e.g., neighbour returning home, roommates walking around, cat purring, clock-radio playing). An equivalent proportion of simulators (i.e., 8 of 16, or 50%) reported distinctive memories. McCann and Sheehan (1988) have argued that these types of reports present problems for investigation of pseudomemory because the events in question may actually have occurred but simply were forgotten by the subjects on initial questioning. Said differently, the lack of objective verification of the events on the night to be remembered make it difficult to determine whether the reports reflect actual events, distorted memories, or reporting biases.

Amongst real hypnotic subjects who reported pseudomemory, we compared the subjective experiences of those who reported hearing the sound exactly-as-suggested with those who reported it as a distinctive or idiosyncratic memory. The results are presented in Table 4. There were no differences in belief, absorption, or vividness of experience. These findings suggest that if real hypnotic subjects

are assimilating or translating the hypnotically suggested noise into distinctive or idiosyncratic memories, they are not doing so with greater belief, absorption or vividness of the memory. On the other hand, subjects who report pseudomemory, either exactly as suggested or modified distinctively, do report these experiences as more subjectively compelling than those who do not report pseudomemories.

To assess whether certain individual difference variables can predict responses to pseudomemory suggestions, we compared real hypnotic subjects who responded to the pseudomemory suggestion with those who did not on absorption, social desirability, conformity, and imagery vividness. The results are presented in Table 5. Real hypnotic subjects who reported pseudomemory scored higher on a scale of conformity (i.e., concern for social appropriateness) than subjects who failed this suggestion. On the other hand, subjects who reported pseudomemory did not report greater amount of sound reduction following the compliance instruction, than those not reporting pseudomemory (see Figure 3).

Table 4. Mean rating on Subjective Experience Questionnaire for Real Hypnotic subjects reporting memories exactly as suggested versus distinctive sounds (N = 20).

Experience	<u>Pseudomemory</u>				t(18)
	Exactly		Distinctive		
	M	SD	M	SD	
Belief	5.67	0.78	6.00	0.93	0.871
Absorption	5.67	0.88	5.63	0.52	0.119
Vividness	5.42	1.31	6.13	0.99	1.27

Note: Twelve of 20 hypnotic subjects reported the sound exactly as suggested and 8 with distinctive descriptions. All t-values are non-significant at .05.

Table 5. Mean rating on Trait measures for Real Hypnotic subjects on Pseudomemory.

Experience	<u>Pseudomemory</u>				t(40)
	Pass		Fail		
	M	SD	M	SD	
Absorption	95.70	13.52	96.27	14.35	0.13
Crowne-Marlowe	14.05	4.76	16.50	4.10	1.79
Cross-situational Variability	23.30	6.59	21.32	8.29	0.85
Attention to Social Comparison	36.75	11.25	29.18	11.92	2.11*
Imagery Vividness	78.35	11.07	76.46	13.42	0.50

Note: *p < .05.

Logical Incongruity.

High versus low simulators. Initially, high and low simulators were compared on the incidence of various indices of logical incongruity. Since the sample sizes of these groups are small, the use of Fisher's exact test rather than the chi-square test was used on these data (Hays, 1988). The results are presented in Table 6. Analyses indicated that these groups failed to differ on any index of logical incongruity. In order to increase the power of subsequent analyses, high and low simulators were combined and compared to the real group.

Reals versus simulators. Table 7 and Figure 4 show the number of reals compared to simulators who indicated a logical incongruity response. As indicated, reals reported a higher incidence of transparent hallucinations [$\chi^2 (1) = 5.35, p < .05$] and duality experiences during age regression [$\chi^2 (1) = 8.90, p < .01$], than simulators. Group differences on incongruous writing tended toward but did not reach conventional levels of significance, $\chi^2 (1) = 2.73, p < .10$. In support of previous findings, the double-hallucination and double-take indices failed to discriminate reals from simulators.

The differences between reals and simulators on both duality and transparency emerged only when subjects were explicitly questioned about such experiences; that is, the reports of transparency and duality were cued by the experimenter. During the EAT interview following each suggestion, no subject spontaneously reported either duality during age regression or spontaneous transparency during the visual hallucination. Such low rates of spontaneous instances of logical incongruity are not unusual (Spanos, deGroot et al., 1987).

Table 6. Comparison of high and low susceptible simulators per incongruity response-item.

Item	High	Low	Fisher's Exact Probability
Sentence Errors			1.00
Yes	7	9	
No	3	3	
Duality			0.59
Yes	1	3	
No	9	9	
Transparency			1.00
Yes	3	4	
No	7	8	
Double Take			0.08
Yes	3	0	
No	7	12	
Double Hallucination			0.57
Yes	8	11	
No	2	1	

Note: Probabilities based on Fisher's Exact test, recommended for small sample sizes.

Table 7. Comparison of reals and simulators for each logical incongruity response item.

Item	Reals	Simulators	χ^2	p
Sentence Errors			3.01	= .08
Yes	20	16		
No	20	6		
Duality			8.92	< .01
Yes	23	4		
No	17	18		
Transparency			5.35	< .05
Yes	25	7		
No	14	15		
Double Take			0.01	> .10
Yes	5	3		
No	34	19		
Double Hallucination			1.21	> .10
Yes	29	19		
No	10	3		

Note: Scored only for subjects who first passed the associated suggestion.

Construct validity. The indices purported to assess logical incongruity have in previous research (e.g., Spanos, Bridgeman, et al., 1983) been found to be poorly correlated, and most often uncorrelated. Of course, an essential criterion of construct validity involves demonstrating reliable intercorrelations amongst various measures of the same construct. To test this hypothesis, real hypnotic subjects were isolated and their responses to each so-called incongruity index were examined. The correlations amongst these measures are shown in Table 8. In accordance with previous findings, logical incongruity indices failed to exhibit a pattern of uniform positive intercorrelations. Transparency of visual hallucination and duality during age regression were significantly related in a positive direction, $r(37) = +0.33$, $p < .05$. Two other correlations were significant, but in a negative direction. Subjects who exhibited duality were less likely to make spelling errors on the writing task than those who did not show this response [$r(37) = -0.29$]. The only other significant correlation was in a direction opposite to that predicted by the logical incongruity hypothesis; that is, duality during age regression was negatively related to the double hallucination response, $r(37) = -0.31$, $p < .05$. These findings raise questions concerning the construct validity of logical incongruity, and suggest that the practice of summing across incongruity indices to arrive at a total index of logical incongruity be discontinued.

Subjective experience and trance logic.: Reals versus simulators. Initially, high and low simulators were compared on each of the three indices of subjective experience, for each suggestion: (1) belief, (2) absorption, and (3) imagery vividness. The means in this analysis are presented in Table 9, and indicate that these groups failed to differ on any index of subjective experience, except absorption in the regression

Table 8. Intercorrelations (phi-coefficients) for Logical Incongruity Items (Hypnotic Reals only)

	SenErr	Duality	Trans	DbTake	DbHall
SenErr	+1.00	-0.29*	+0.07	+0.22	+0.13
Duality		+1.00	+0.33*	+0.20	-0.31*
Trans			+1.00	-0.01	-0.10
DbTake				+1.00	+0.05
DbHall					+1.00

Note: Listwise deletion of data (N=37).

*p < 0.05 (two-tailed)

Table 9. Mean rating on Subjective Scales for high and low simulating subjects.

Experience	Susceptibility				t(20)
	High		Low		
	M	SD	M	SD	
Regress Belief	6.00	0.67	6.00	0.74	0.00
Regress Absorb	6.40	0.70	5.33	0.99	2.87**
Regress Vivid	6.10	0.57	5.50	1.68	1.08
Hall Belief	5.60	0.84	6.17	0.94	1.48
Hall Absorb	5.80	0.42	5.75	0.97	0.15
Hall Vivid	6.00	0.67	5.83	0.94	0.47

Note: 22 subjects. **p<.01.

suggestion: high simulators reported more absorption in the regression suggestion than lows. In order to enhance power, high and low simulators were combined and compared to the real group. Table 10 shows the ratings for each subjective experience questionnaire for reals and simulators. The results indicate that simulators rated their belief in both the regression and hallucination experience as greater than reals.

Subjective experience and logical incongruity: Correlational Analyses. The logical incongruity hypothesis predicts a positive relationship between the incidence of trance logic responding and the intensity of subjective experience (e.g., credibility, absorption and vividness of experience) in hypnotic reals. On the other hand, the differential demands hypothesis predicts a negative relationship between these variables; that is, constrained by implicit demands for honesty, real hypnotic subjects will adjust their subjective experience ratings to reflect the difficulty they experience in maintaining the requisite subjective effects throughout the entire suggestion period. To test this hypothesis, the three subjective responses to each suggestion (e.g., credibility, absorption and vividness of experience) were correlated with each trance logic index (or indices). The results are shown in Table 11. As indicated, on the indices which discriminated between reals and simulators (i.e., transparency of hallucination and duality during age regression) negative correlations were found between these indices and subjective experience responses. Only those involving transparency of hallucination reached conventional levels of significance ($p < .05$, two-tailed). On the indices which failed to discriminate reals from simulators (e.g., incongruous writing during age regression, double-hallucination and double-take during visual hallucination), all the correlations were in the positive direction, though only one

Table 10. Mean rating on Subjective Scales for real and simulating subjects.

Experience	Group				t(62)
	Real		Simulator		
	M	SD	M	SD	
Regress Belief	5.26	1.79	6.00	0.69	1.88*
Regress Absorb	5.40	1.56	5.82	1.01	1.12
Regress Vivid	5.50	1.63	5.78	1.31	0.68
Hall Belief	5.02	1.85	5.91	0.92	2.10*
Hall Absorb	5.17	1.72	5.77	0.75	1.57
Hall Vivid	5.50	1.67	5.91	0.81	1.08

Note: *p<.05.

Table 11. Intercorrelations (point-biserial) for Logical Incongruity Items and associated Subjective Experiences Questionnaires (Hypnotic Reals only)

	Belief	Absorb	Vividness
Regression			
SenErr	-0.07	-0.14	+0.01
Duality	-0.14	-0.16	-0.22
Hallucination			
Trans	-0.42*	-0.40*	-0.50*
DbTake	+0.17	+0.31	+0.12
DbHall	+0.41*	+0.18	+0.16

Note: Listwise deletion of data (N=37).

*p < 0.05 (two-tailed)

was statistically significant; that is, the double hallucination response and belief in the reality of the hallucination.

Trance logic has been interpreted by Orne (1979) as a genuine hallmark of hypnosis. According to this hypothesis, subjects who evidence duality, incongruous writing, and transparency should report more compelling subjective experiences than those who fail to evidence these responses. To examine this hypothesis, subjects were divided on each index into those who exhibited trance logic and those who did not. As shown in Table 12, subjects who reported duality during the hypnotic age-regression suggestion did not report greater belief, absorption, or vivid details than subjects who did not show this response. Contrary to the trance logic hypothesis, transparency during the visual hallucination suggestion was accompanied by lower subjective experience ratings than solid hallucinations.

Incomplete Responding.

Reals versus Simulators. Initially, high and low simulators were compared on the frequency of the four indices of incomplete responding: (1) regression qualifiers, (2) regression details, (3) hallucination qualifiers, and (4) hallucination details. The means in this analysis are presented in Table 13, and indicate that these groups failed to differ on any index of incompleteness. In order to enhance power, high and low simulators were combined and compared to the real group. Table 14 shows the frequency of each incompleteness responses for reals and simulators. The results indicate that reals scored higher than simulators on two measures of incompleteness; namely, the use of qualifiers in describing both their regression and hallucination experiences.

Table 12. Mean rating on Subjective Experience Questionnaire for Real Hypnotic subjects passing versus failing each logical incongruity item.

Item	Belief	Absorb	Vividness
<hr/>			
Sentence Errors			
Yes	5.24	5.24	5.52
No	5.45	5.70	5.65
Duality			
Yes	5.00	5.17	5.13
No	5.61	5.72	6.00
Transparency			
Yes	4.68 _a	4.76 _a	5.20 _a
No	6.13 _b	6.13 _b	6.60 _b
<hr/>			

Note: Scored only for subjects who first passed the associated suggestion.
Within-column means sharing different subscripts differ significantly at $p < .01$.

Table 13. Mean rating on Incompleteness Indices for high and low simulating subjects.

Experience		Susceptibility				t(20)
		High		Low		
		M	SD	M	SD	
Regress	Qualifier	1.50	1.43	1.67	0.99	0.32
Regress	Descript	2.40	1.71	2.42	2.02	0.02
Hall	Qualifier	1.10	0.57	2.08	2.35	1.29
Hall	Descript	12.80	4.10	10.92	2.91	1.26

Note: 22 subjects.

Table 14. Mean rating on Incompleteness Indices for Real and Simulating subjects.

Experience		Group				t(60)
		Real		Simulator		
		M	SD	M	SD	
Regress	Qualifier	2.48	1.47	1.59	1.18	2.42**
Regress	Descript	2.93	1.83	2.41	1.84	1.06
Hall	Qualifier	2.49	1.92	1.64	1.81	1.70*
Hall	Descript	11.33	3.57	11.77	3.55	0.46

Note: 62 subjects.**p<.01; *p<.10.

Incompleteness and trance logic. To further assess the discriminating power of the incompleteness indices, correlational analyses were conducted between these indices and the standard reliable indices of trance logic. The differential demands hypothesis predicts that trance logic indices will differentiate reals from simulators when those indices also assess incomplete responding. These analyses presented in Table 15 indicate that the measures of incompleteness that differentiated reals from simulators were related to the indices of trance logic which differentiated these groups; namely, regression qualifiers correlated with duality, $r(35) = .339$, $p < .05$ and hallucination qualifiers correlated with transparency, $r(35) = .329$, $p < .05$.

Incompleteness and Subjective Experience. Correlational analyses were conducted between the incompleteness indices and the corresponding subjective experience indices. Qualifiers were predicted to be negatively correlated with subjective experience, and descriptors were predicted to be positively correlated with subjective experience. The analyses, presented in Table 16, support this pattern of predictions. Subjects who used more hallucination qualifiers to describe their experience, reported less belief and absorption in that experience. Belief and absorption in the hallucination experience was positively related to the number of descriptors used by subjects to describe that experience. As predicted, regression qualifiers were negatively related to all three indices of subjective experience. Absorption in the regression experience was also positively related to the number of descriptors used to describe that experience.

Table 15. Intercorrelations (point-biserial) for Logical Incongruity Items and Incompleteness Indices (Hypnotic Reals only)

	RQual	RDesc	HQual	HDesc
SenErr	+0.01	+0.12	+0.23	+0.49**
Duality	+0.34**	-0.21	+0.26*	-0.28*
Trans	+0.27*	+0.03	+0.33**	+0.01

Note: Listwise deletion of data (N=37).

**p < 0.05 (two-tailed)

* p < 0.05 (one-tailed)

Table 16. Intercorrelations for Subjective Experience Indices and Incompleteness Indices (Hypnotic Reals only)

	RQual	RDesc	HQual	HDesc
Regression				
Belief	-0.31**	+0.20		
Absorb	-0.32**	+0.31**		
Vivid	-0.42**	+0.01		
Transparency				
Belief			-0.43**	+0.33**
Absorb			-0.44**	+0.35**
Vivid			-0.27*	+0.19

Note: Listwise deletion of data (N=37).

**p < 0.05 (two-tailed)

* p < 0.05 (one-tailed)

Compliance

Trance logic and compliance. The compliance-paradigm has never been used to compare real and simulating subjects. In order to determine whether reals and simulators respond differently to the compliance-inducement in session 2, a 2 (Group: Real/Simulator) X 2 (Condition: Compliance/Control) X 3 (Trials) ANOVA was conducted on the raw auditory intensity reports of the three trials (see Table 17). The analysis indicated main effects for Group, $F(1,60) = 9.53$, $p < .01$ and Trials, $F(1,60) = 67.46$, $p < .01$. These effects were qualified by a higher order Group X Trials interaction, $F(1,60) = 2.97$, $p = .055$, and a Condition X Trials interaction, $F(1,60) = 3.912$, $p < .05$. Simple main effect analyses performed at each level of the Trials factor indicated significant differences between reals and simulators during each trial. The means are presented in Table 18. Reals reported higher sound ratings than simulators on trials 1 [$F(1,60) = 5.029$, $p < .05$], trial 2 [$F(1,60) = 3.70$, $p = .059$] and trial 3 [$F(1,60) = 12.54$, $p < .01$]. Simple main effect analyses on the Condition X Trials interaction indicate that subjects in the Compliance condition reported lower sound ratings on the third trial than control subjects. These means are presented in Table 19. In short, the compliance manipulation served to elicit lower sound ratings from subjects. No other differences between conditions were significant.

Orne (1979) has suggested that trance logic responding (e.g., duality and incongruous writing during age regression, transparency during visual hallucination) are genuine hallmarks of hypnosis. Said differently, real hypnotic subjects who fail to show this response may be complying to the demand characteristics of the situation. To test this hypothesis a series of four separate MANOVAs were conducted to

Table 17. Summary table for 2 (Group: Real/Simulator) X 2
(Condition: Compliance/Control) X 3 (Trials) ANOVA

Effect	F-ratio	p-value
Main Effects		
Group (G)	9.53	.003
Condition (C)	2.69	.106
Trials (T)	67.46	.000
Interactions		
GXC	0.94	.336
GXT	2.97	.055
CXT	3.91	.023
GXCXT	1.86	.159
Simple Main Effects		
Group (G)		
Trial 1	5.029	.029
Trial 2	12.540	.001
Trial 3	3.701	.059
Condition (C)		
Trial 1	0.017	.897
Trial 2	3.063	.085
Trial 3	5.151	.027

Note: Analysis based on 64 subjects. All simple effects based on 1 and 60 degrees of freedom.

Table 18. Mean Sound Intensity rating across trials for each group.

Trial	Group			
	Real		Simulator	
	M	SD	M	SD
Trial 1	17.02	2.74	14.86	4.36
Trial 2	11.93	4.08	7.96	5.12
Trial 3	15.21	3.70	13.18	5.15

Note: All within-row means differ at $\alpha = .05$.

Table 19. Mean Sound Intensity rating across trials for each condition (Compliance vs Control).

Trial	Group			
	Compliance		Control	
	M	SD	M	SD
Trial 1	16.50 _a	3.29	15.86 _a	3.92
Trial 2	10.24 _a	4.88	11.18 _a	4.73
Trial 3	13.98 _a	4.61	15.55 _b	3.58

Note: Within-row means sharing different subscripts differ at $\alpha = .05$.

determine whether real hypnotic subjects ($n = 31$) who showed trance logic (or pseudomemory) were less likely to comply to the compliance-inducement than subjects who do not show these responses. The auditory ratings during the hypnotic deafness and compliance trial were converted to percent baseline scores to correct for individual differences in subjective scaling. Three separate 2 (trance logic: Present or absent) X 2 (% sound change: trial 2 vs trial 3) ANOVAs were conducted, one for each trance logic measure. Furthermore, an additional analysis using pseudomemory responding, rather than trance logic responding, was conducted in a similar manner. These results are presented in Tables 20 to 23 and Figures 6 to 8.

In each of these analysis, the trance logic index failed to interact with the Trials factor suggesting that trance logic is unrelated to degree of compliant responding. Subjects who showed trance logic did not differ from subjects who did not show such responding on the trial 3 sound change. Similar results were obtained in the pseudomemory analysis, where subjects who showed pseudomemory did not comply more in response to the compliance-inducement than subjects who did not show pseudomemory. The only result which consistently emerged in these analysis is a main effect for Trials, indicating that sound change on both Trials 2 and 3 was significantly different from zero.

One reason that the aforementioned trance logic indices may have failed to predict the degree of compliant responding is that a high proportion of subjects complied to the instruction. In other words, the above findings may be a function of a floor effect in the number of subjects not complying. To investigate this hypothesis, real hypnotic subjects in the compliance condition were dichotomized into two groups: those reporting less sound on the third trial than the baseline trial and those

Table 20. Summary Table of 2 (Pseudomemory:Yes/No) X 2 (Trials: 2 & 3) on Percent Change Scores.

Effect	F-ratio	p-value
Main Effects		
Pseudomemory (P)	0.54	.468
Trials (T)	24.49	.000
Interactions		
P X T	0.02	.903
Simple Main Effects		
Trial 2 Change	52.70	.000
Trial 3 Change	9.38	.005

Note: Analysis based on 31 real hypnotic subjects in the compliance condition. All simple effects based on 1 and 29 degrees of freedom.

Table 21. Summary Table of 2 (Sentence Errors:Yes/No) X 2 (Trials: 2 & 3) on Percent Change Scores.

Effect	F-ratio	p-value
Main Effects		
Sentence Errors (S)	0.90	.350
Trials (T)	23.63	.000
Interactions		
P X T	0.11	.748
Simple Main Effects		
Trial 2 Change	52.13	.000
Trial 3 Change	9.74	.004

Note: Analysis based on 30 real hypnotic subjects in the compliance condition who first passed the age regression suggestion. All simple effects based on 1 and 28 degrees of freedom.

Table 22. Summary Table of 2 (Duality:Yes/No) X 2 (Trials: 2 & 3) on Percent Change Scores.

Effect	F-ratio	p-value
Main Effects		
Duality (D)	0.08	.779
Trials (T)	24.54	.000
Interactions		
P X T	0.43	.837
Simple Main Effects		
Trial 2 Change	51.56	.000
Trial 3 Change	8.95	.006

Note: Analysis based on 30 real hypnotic subjects in the compliance condition who first passed the age regression suggestion. All simple effects based on 1 and 28 degrees of freedom.

Table 23. Summary Table of 2 (Transparency:Yes/No) X 2 (Trials: 2 & 3) on Percent Change Scores.

Effect	F-ratio	p-value
Main Effects		
Transparency (T)	0.73	.402
Trials (T)	26.23	.000
Interactions		
P X T	1.39	.248
Simple Main Effects		
Trial 2 Change	54.86	.000
Trial 3 Change	8.67	.006

Note: Analysis based on 29 real hypnotic subjects in the compliance condition who first passed the hallucination suggestion. All simple effects based on 1 and 27 degrees of freedom.

reporting sound intensities on the third trial greater than or equal to their baseline trial. These groups were compared in the incidence of logical incongruity using chi-square analyses. The results are presented in Table 24. Analyses indicated that a high proportion of subjects complied on the third trial, regardless of whether they reported a trance logic response. This finding attests to the "take" of the experimental manipulation and confirms that with little variability in compliance responding, the trance logic measures could not predict such responding.

Subjective experience and compliance. According to the differential demands hypothesis, subjects report less intense subjective experiences when they have difficulty in maintaining the requisite subjective effects throughout the entire suggestion period. One prediction from this hypothesis is that, in real hypnotic subjects, these subjective experience indices (e.g., credibility, absorption, and vividness) will be negatively related to trial 3 compliance-induced sound changes; that is, the greater the subject's reported subjective experience, the greater their reported sound decrements in response to the compliance-instruction. The results are presented in Table 25. The analysis indicates that the subjective indices of the regression experience were all negatively correlated with trial 3 sound change. Indices tapping the intensity of the hallucination experience failed to predict response to the compliance-instruction.

Incompleteness and compliance. The differential demands hypothesis suggests that incomplete responding indicates more accurate and honest reporting amongst hypnotic subjects than does complete responding. Incomplete responding is characterized by few and

Table 24. Number of Real Hypnotic subjects in the compliance group who complied (Trial 3 < Baseline) versus did not comply by response index.

Item	Did Not Comply	Complied	χ^2	p
Pseudomemory			2.695	n s
Yes	7	10		
No	2	12		
Sentence Errors			2.33	n s
Yes	2	11		
No	7	10		
Duality			1.43	n s
Yes	6	9		
No	3	12		
Transparency			1.08	n s
Yes	5	7		
No	4	13		

Note: Only subjects who passed the suggestion were scored for a trance logic response.

Table 25. Intercorrelations for Subjective Experience Indices and Trial 3 Sound Change for Real Hypnotic subjects given the Compliance Instruction.

Experience	Trial 3 Sound Change
Regress Belief	-0.29*
Regress Absorb	-0.36**
Regress Vivid	-0.24
Hall Belief	+0.05
Hall Absorb	+0.06
Hall Vivid	-0.04

Note: Only subjects who passed both suggestions were included in this analysis (n = 28).

**p<.05 (two-tailed)

* p<.05 (one-tailed)

vague details of the experience, with the use of qualifiers in describing such experiences. According to this hypothesis, subjects who respond incompletely are reporting relatively accurately about their less-than-ideal experience, and thus are not complying relatively to experimental demands. From this hypothesis, individual differences on response completeness may be related in part to individual differences in people's abilities to create subjectively compelling hypnotic experiences (e.g., credibility, absorption-in, and vividness). However, individual differences on the intensity of these subjective experiences may also predict compliance to experimental demands. One prediction from this hypothesis is that incomplete responding and the intensity of subjective experience predicts response to the compliance-inducement. To test this hypothesis, the four measures of incompleteness (i.e., number of fine details and number of qualifiers for the regression and hallucination suggestion) and the six measures of subjective experience were used in an heirarchical-regression framework to predict percent sound change on the third (i.e., compliance) trial. The results are presented in Table 26 and Figure 9. The analysis indicates that, taken together, these measures of incompleteness and subjective experience account for almost 60% of the variance in Trial 3 sound change. This finding suggests that compliance accounts for a large proportion of the individual differences in incomplete responding and intensity of subjective experience. This finding also casts doubt on the accuracy of subjective reports proffered by subjects. Compare this finding with the proportion of variance in Trial 3 sound change that the three indices of logical incongruity (i.e., sentence errors and duality during age regression, and transparency during visual hallucination) account for. As Table 27 and Figure 10 indicate, these trance logic indices

Table 26. Regression Analysis of Incompleteness and Subjective Experience Indices on Trial 3 Sound Change for Real Hypnotic subjects given the Compliance Instruction.

Predictors	R	R ²
Regression Qualifiers	.048	.002
Regression Descriptors	.530	.281
Hallucination Qualifiers	.532	.283
Hallucination Descriptors	.581	.337
Regression Belief	.634	.402
Regression Absorption	.635	.404
Regression Vividness	.649	.421
Hallucination Belief	.736	.542
Hallucination Absorption	.775	.600
Hallucination Vividness	.776	.601

Note: Only subjects who passed both suggestions were included in this analysis (n = 28).

Table 27. Regression Analysis of Logical Incongruity Indices on Trial 3 Sound Change for Real Hypnotic subjects given the Compliance Instruction.

Predictors	R	R ²
Regression Sentence Err	.218	.048
Regression Duality	.219	.048
Hallucination Transparency	.219	.048

Note: Only subjects who passed both suggestions were included in this analysis (n = 28).

together account for less than 5% of the variance in Trial 3 sound change. These findings suggest that incompleteness responding is a better predictor of compliance than trance logic responding.

Individual differences, trance logic and compliance. Reals who exhibited duality, incongruous writing, and transparency were compared with those who did not exhibit such responses on various trait measures. These measures included the ABS subscale of the DPQ (Tellegan, 1982) or Absorption Scale, the Vividness of Mental Imagery Scale, the Crowne-Marlowe (1964) Scale of Social Desirability, Lennox and Wolfe's (1984) Conformity scale. The means for each scale are presented separately for each trance logic index in Tables 28, 29, and 30. The data indicate that subjects who showed a trance logic response (e.g., duality) failed to differ from those who did not on any trait measure.

Amongst real hypnotic subjects in the compliance condition, correlational analyses were conducted between each of the above mentioned trait measures and sound reductions on trial 3. These correlations are presented in Table 31. Examination of the table indicates that only Cross-Situational Variability predicted response to the compliance-inducement ($r = 0.33$, $p < .05$ one-tailed); that is, subjects whose behaviour is dictated by situational norms have a tendency to comply more to the compliance-inducement. Also noteworthy was that reports of distraction strategy use during the third trial were related to compliance; the greater the degree of reported sound reduction, the more the reported cognitive strategy use [$r(26) = -0.35$, $p < .05$]. These findings suggest that subjects who bias their trial 3 sound reports may also bias their reporting of strategy use.

Table 28. Mean rating on Trait measures for Real Hypnotic subjects on Sentence Errors.

Experience	<u>Sentence Errors</u>				t(38)
	Pass		Fail		
	M	SD	M	SD	
Absorption	96.57	12.98	96.55	14.31	0.01
Crowne-Marlowe	14.71	4.05	15.70	5.01	0.69
Cross-situational Variability	21.76	7.31	22.60	8.02	0.35
Attention to Social Comparison	32.14	10.07	33.50	14.41	0.35
Imagery Vividness	76.91	12.53	77.50	12.48	0.15

Note: 20 subjects made writing errors and 20 did not.

Table 29. Mean rating on Trait measures for Real Hypnotic subjects on Duality.

Experience	<u>Duality</u>				t(38)
	Pass		Fail		
	M	SD	M	SD	
Absorption	95.04	13.54	97.28	14.41	0.51
Crowne-Marlowe	14.79	4.94	16.06	3.98	0.89
Cross-situational Variability	21.96	7.47	22.67	7.75	0.30
Attention to Social Comparison	31.33	12.42	34.72	11.69	0.90
Imagery Vividness	75.92	10.84	79.28	13.99	0.88

Note: 23 subjects showed duality and 17 did not.

Table 30. Mean rating on Trait measures for Real Hypnotic subjects on Transparency.

Experience	Transparency				t(38)
	Pass		Fail		
	M	SD	M	SD	
Absorption	95.72	11.89	98.07	16.49	0.52
Crowne-Marlowe	14.72	4.61	15.93	4.65	0.80
Cross-situational Variability	22.04	6.96	23.73	8.22	0.69
Attention to Social Comparison	35.88	10.32	29.67	13.19	1.66
Imagery Vividness	76.12	11.47	80.73	13.29	1.17

Note: 25 subjects showed transparency and 14 did not.

Table 31. Intercorrelations for individual difference measures and Trial 3 change scores (Hypnotic Reals in Compliance Condition only)

	Sound Change
Absorption	-0.12
Crowne-Marlowe	-0.09
Cross-Situational Variability	+0.33*
Attention to Social Comparison	-0.16
Imagery Vividness	+0.02
Rating Strategy	-0.35*

Note: Only subjects who passed both suggestions were included in this analysis (n = 28).

* $p < 0.05$ (one-tailed)

Discussion

Pseudomemory

The results corroborate earlier research that hypnotically-suggested memories are reported by approximately 48% of highly hypnotizable subjects. While not all of these subjects maintained these reports in a post-hypnotic interview, most subjects did (i.e., 80%) . These findings suggest that pseudomemory responding appears to be a reliable phenomenon across studies. Simulators also showed such responses. In fact, simulators were somewhat more likely than reals to initially make pseudomemory responses, and once having made such a response, were as likely as reals to maintain their reports posthypnotically.

Response to pseudomemory suggestions have been variously interpreted as genuine memory creations (Laurence & Perry, 1983) and as reporting biases (Spanos & McLean, 1986). One means of testing whether the pseudomemory situation contains demands for biased reporting was to compare the response of real hypnotic subjects with those instructed to fake the role of "good" hypnotic subjects. The finding that reals were less likely than simulators to respond to the pseudomemory suggestion suggests that these suggestions contain explicit demands which dictate what constitutes situationally-appropriate responding. Approximately, half of the hypnotic subjects responded to such demands.

Traditionally, real-simulator differences were attributed to the presence of hypnosis in the reals and to its absence in the simulators (Orne, 1959). More recently, however, it has been suggested that these differences are due to different demands placed on the two groups. According to this hypothesis, simulators (unlike reals) are not exposed to implicit demands to report honestly or accurately about

their experiences and thus tend to give the appearance of making complete or ideal responses. To this end, they are more likely than reals to report a subjectively compelling experience; one that is more believed-in and vivid, as well as one in which they are more absorbed. If indeed pseudomemory responding reflects reporting biases, then the real hypnotic subjects (like simulators) showing such a response would be expected to describe their experience as more subjectively compelling than those real hypnotic subjects who fail to show pseudomemory. The analogy with reals and simulators is apparent: simulators who are explicitly complying to experimental demands usually report more subjectively compelling experiences. Therefore, reals who comply to the pseudomemory suggestion should also report greater belief-in, absorption-in, and vividness of experience. When we tested this hypothesis, reals who reported pseudomemory indeed reported greater belief-in, absorption-in, and vividness of experience. This finding is consistent with the hypothesis that pseudomemory responding, to a substantial degree, involves compliance-induced reporting bias.

It has been suggested (McCann & Sheehan, 1988) that pseudomemory responding may be particularly subjectively compelling when hypnotic subjects translate or assimilate the suggested-sound into a distinctive or autobiographical memory. We tested this hypothesis by comparing reals who reported hearing the sound exactly-as-suggested with those reals who incorporated the suggestion into a distinct memory (i.e., neighbour returning home, alarm went off, etc.). These results indicated that the subjective intensity of the pseudomemory experience was no different among these groups, though both these groups reported the experience as more subjectively compelling than those subjects who failed to report pseudomemory. These findings are consistent with the hypothesis that pseudomemory reflects a reporting bias rather than the creation of a distinctive autobiographical memory.

Recent research by both McCann and Sheehan (1987) and Spanos and McLean (1986) converge on the present findings. Both these investigators found that highly hypnotizable subjects exposed to pseudomemory suggestions retain substantial access to their original memories and, to a substantial degree, can distinguish between their original memories and their suggestion-induced imaginings. It appears that subjects will report the merging of these memories when pressured to do so; however, when the situational demands change, as in a legal cross-examination of this testimony, subjects disavowed their earlier testimony. Moreover, Spanos, Gwynn et al. (1989) found hypnotic procedures were no more likely than nonhypnotic procedures to facilitate pseudomemories, or confidence in the pseudomemories. Taken together, these findings suggest hypnotic procedures do not facilitate false believed-in memories that are indistinguishable from real memories. Instead, these reports reflect contextually guided reporting biases (Spanos, Gwynn, et al. 1989).

When real hypnotic subjects who reported pseudomemory were compared to those not reporting pseudomemory on various individual difference measures, attention to social comparison was the only characteristic that differentiated these groups. According to its developers, Lennox and Wolfe (1984), this scale reflects long-term tendencies to conform or to avoid behaviors that depart extremely from the norm of a reference group. Though pseudomemory responding may reflect a general disposition to conform, it did not predict the extent to which subjects biased their responses following the compliance instruction in the second-session auditory experiment. One might expect that if pseudomemory responding reflects a reporting bias then responsive subjects would report greater reductions in sound following the compliance-instruction than those not reporting pseudomemory. Though this hypothesis was not supported, it is possible that a general disposition

to conform might predict conformity in some situations but not in others; in the present instance, conformity predicted pseudomemory responding but not compliance in the auditory paradigm.

Treatment Differences and Trance Logic

As in previous research (e.g. Spanos, deGroot et al., 1987), we found no differences between high and low susceptible simulators on the various indices of logical incongruity. This finding suggests that the instructional set administered to subjects, rather than their pre-existing susceptibility levels, was the critical factor in eliciting trance logic responding. The two simulating groups combined differed significantly from the reals on two of five indices of trance logic: duality experiences during age regression and transparency during visual hallucination. The reals more frequently exhibited transparency and duality than did the simulators. These findings are consistent with a number of earlier reports of real/simulator differences on duality (Laurence & Perry, 1981; Nogrady et al., 1983; Perry & Walsh, 1978; Spanos, deGroot, et al., 1985; Spanos, deGroot, et al., 1987) and transparency (Johnson et al., 1972; McDonald & Smith, 1975; Peters, 1973; Sheehan et al., 1976; Spanos, deGroot, et al., 1985; Spanos, deGroot, et al., 1987 Stanley et al., 1986). Although the incongruous (i.e., correct) writing index significantly discriminated real and simulating subjects in some previous studies (e.g., Nogrady et al., 1983; Obstoj & Sheehan, 1977; Spanos, deGroot, et al., 1985; Spanos, deGroot, et al., 1987), this index did not discriminate these groups in the present study. There was a trend in this predicted direction, though the differences did not reach conventional levels of significance ($p < .05$). Other research (Lynn et al., 1985; Peters, 1973) has similarly failed to find significant differences between real and simulating subjects on incongruous writing.

The failure to find differences on the double hallucination response and the double-take response is consistent with at least nine other studies which failed to replicate Orne's (1959) original finding of higher frequency of double hallucination responding among reals than simulators. In short, only two of five indices of trance logic responding differentiated reals from simulators. The trance logic hypothesis predicts that all 5 indices will differentiate reals from simulators. In contrast, the differential demands hypothesis predicts that only those indices which tap incomplete responding will differentiate reals from simulators. According to this hypothesis, regression and hallucination suggestions are difficult in terms of subjects maintaining the requisite subjective experiences for the entire suggestion period. For example, many of the reals were unable to maintain a high level of absorption in the role of being a 5-year old for the full duration of the test period, but were able to feel like a child for at least part of that period. Similarly, with eyes open, most reals were unable to generate a highly vivid, complete, solid image but were able to generate incomplete and transparent images. As suggested by Spanos et al. (1985), these subjects acknowledged their variable and incomplete responses to the test demands by stating that their hallucinations were transparent or that part of the time they felt like an adult. These responses reflect honest, not illogical reports. Though honest and accurate reporting are implicitly demanded of all reals, not all these subjects conform to these demands. Those reals who did not show trance logic responses (i.e., ignored such demands and "faked good") reported greater belief, absorption-in, and vividness of the hallucination experience than those reals who did exhibit this trance logic response.

The trance logic hypothesis (Orne, 1979) predicts a positive relationship between trance logic response and subjective experience indices. Specifically, response to trance logic items that successfully discriminate reals from simulators should occur most frequently in

those hypnotic reals who report the most subjectively compelling responses to the items. Though one such correlation did arise (i.e., double hallucination response and belief in the reality of the experience), this index failed to discriminate between reals and simulators. That is, both reals and simulators were equally likely to show the double hallucination response, and believe-in the reality of the suggested hallucination. On the other hand, the differential demands hypothesis of Spanos et al. (1987) predicts that the frequency of trance logic responding to those items should be negatively correlated with the subjective intensity of the subjects' response, and should be negatively correlated with the degree of credibility that the subjects assign to their suggested experiences. The findings here provide support for the differential demands hypothesis. Hypnotic reals who exhibited transparency of hallucination were less likely than those who did not exhibit such a response to report believing in the suggested situation, to become absorbed in the suggestion, and to report intense subjective experiences in response to the suggestion. This same pattern of a negative correlation was found for the duality and incongruous writing indices, though the correlations did not reach conventional levels of significance.

Also discrepant with the trance logic hypothesis, which predicts reliable real/simulator differences on all five indices of trance logic, is the low-to-nonexistent correlations between the indices. Previous research has offered no support for reliable intercorrelations amongst these indices (Obstoj & Sheehan, 1977; Spanos, deGroot, et al., 1985). The only positive relationship to emerge was that between duality and transparency, the same two indices predicted by the differential demands hypothesis to predict incomplete responding. Two other correlations were significant, but in a negative direction. Subjects who exhibited duality were less likely to make spelling errors on the writing task than those who did not show this response.

This is consistent with the differential demand hypothesis. It indicates that subjects who respond incompletely in regression (i.e., show duality) stop responding before the end of the suggestion and, therefore write like an adult. Moreover, subjects who showed duality were less likely to exhibit the double hallucination response than those subjects who did not show duality. This latter finding contradicts the trance logic hypothesis which predicts a positive relationship between these and other trance logic measures. Taken together, the findings raise questions concerning the construct validity of logical incongruity. Moreover, the relationship between the logical incongruity indices (i.e., duality and transparency) that discriminate reals from simulators may reflect the common ingredient of incompleteness of response.

Support for the differential demands hypothesis was obtained from the finding that, on the indices which discriminated between reals and simulators (i.e., duality and transparency), there was a negative relationship between subjective experience and trance logic response. For example, reals who showed a transparency response reported less belief-in, absorption-in and vividness-of the suggested experience than reals who reported solid hallucinations. The fact that transparency in reals was accompanied by tenuous rather than firm beliefs in the reality of the hallucinated image suggests that both the transparency of the image and the tenuous belief reflect the hypnotized subjects' "incomplete" hallucinatory experience. These findings are consistent with others (e.g., Stanley et al., 1986) and support the hypothesis that transparency reports may come about because hypnotic subjects only rarely develop solid, "ideal" hallucinations.

There was a trend for a similar negative relationship between the duality index and subjective experience indices, although these did not reach conventional levels of significance. This finding is consistent with the differential demands hypothesis: duality

experiences reflect the difficulty of maintaining the requisite subjective effects of regression throughout the entire suggestion period.

In short, the failure of most of the trance logic items to intercorrelate coupled with the consistent failure of most of these items to discriminate between reals and simulators suggests that the construct of trance logic is tenuous. On the other hand, that real/simulator differences emerged on the two indices hypothesized to measure incomplete responding suggests that incomplete responding rather than trance logic accounts for differences between reals and simulators. This conclusion gains support from the relationship of incomplete responding (i.e., regression and hallucination qualifiers) to only those indices which discriminated between reals and simulators; that is, duality and transparency.

Trance Logic and Compliance

Further tests of the trance logic hypothesis were made with regard to compliance with experimental demands in the session-two auditory paradigm. Recall, that the trance logic hypothesis regards such behaviours as hallmarks of genuine hypnotic responding. One prediction from this hypothesis, is that real hypnotic subjects who show such trance logic responses are honestly reporting on the nature of their experience. Consequently, when subjected to pressures to bias their reporting, these subjects should resist the pressures to comply. In contrast, real hypnotic subjects who fail to show such trance logic responses might be, like simulators, complying to experimental demands. Thus, when exposed to pressures to comply (in the auditory paradigm), these subjects would be more likely to comply. When real hypnotic subjects were dichotomized into those who showed a particular index of trance logic and those who did not, there was no difference between the

groups in the amount of reported sound change on the session-two compliance trial. That is, regardless of whether subjects showed duality (or transparency, or sentence errors) or not, they were equally likely to comply when pressured to do so. These findings suggest that subjects who fail to show trance logic may not necessarily be complying nor are those who show trance logic necessarily being accurate about their experiences. In short, trance logic appears to be a poor discriminator of compliance to experimental demands.

The differential demands hypothesis argues that differences in instructional-set account for real/simulator differences. When this hypothesis was tested in the second session, it was found that simulators reported lower sound intensities than reals on all three auditory trials. This finding suggests that when subjects are instructed to fake the role of a "good" hypnotic subject, they tend to underestimate the intensity of the experience of sound. Stanley et al. (1986) adopted a similar interpretation of simulating subjects' behaviour. They suggest that the central task of simulators is not to report honestly but to avoid detection as a faker, a role that can perhaps best be fulfilled by the adoption of a conservative response set marked by caution, suspicion, and inhibition of response when in doubt.

The invitation to comply resulted in lower sound intensity ratings on the third trial. These groups (i.e., compliance/no compliance instruction) did not differ on the first or second trial. This finding suggests that our manipulation successfully induced the reporting biases they intended.

Incomplete Responding and Compliance

The differential demands hypothesis predicts that only those indices which tap incomplete responding will differentiate reals from

simulators. According to this hypothesis, regression and hallucination suggestions are difficult in terms of maintaining the requisite subjective experiences for the entire suggestion period. Reals are constrained by implicit demands for honest and accurate reporting. Therefore, when they are unable to maintain the requisite subjective experiences throughout the suggestion period, they tend to report honestly that they responded incompletely. For example, they recount few and vague details about their experience, qualifying that experience as less-than-real. In short, as the data here indicate, their experience is not subjectively compelling. Both transparency and duality discriminate reals from simulators because they index differences in the completeness with which subjects fulfill suggested demands. Other so-called trance logic indicators like the double-take and double-hallucination indices do not tap incomplete responding, and thus do not distinguish reals from simulators.

When incomplete responding was assessed independently of trance logic (i.e., duality and transparency), high and low simulators showed no significant differences in incomplete responding. This finding suggests that pre-existing differences in susceptibility do not predict incomplete responding. A similar finding was evidenced with respect to trance logic. On the other hand, both these simulating groups showed significantly less incomplete responding (i.e., regression and hallucination qualifiers) to the age regression and hallucination suggestions than did the real hypnotic subjects. This finding corroborates that of others (e.g., Spanos, Bridgeman et al., 1983; Spanos, deGroot, et al., 1985; Stanley et al., 1986) and provides support for the hypothesis that simulators tend to make more complete or "ideal" responses than do reals. Moreover, it was found amongst the reals that the incompleteness indices correlated significantly with duality $r(35) = .34, p < .05$, and with transparency, $r(35) = .33, p < .05$. This suggests that duality and transparency indices differentiate reals from simulators because they tap incomplete

responding. On the other hand, that index which failed to discriminate between reals and simulators (i.e., sentence errors) did not correlate with its respective incompleteness index (i.e., regression qualifiers).

A second index of incompleteness (i.e., number of fine details reported) failed to correlate with its respective trance logic index, a finding which failed to support the incompleteness hypothesis. It has been suggested (e.g., Sheehan, 1971a) that the nature of the questioning procedure and the cues provided by such questions may underlie real-simulator differences. In short, real-simulator differences are more likely to emerge on tasks which are highly structured (unambiguous) and contain explicit cues for appropriate responding. When a series of questions are asked it may indicate to subjects that elaboration of fine details is the desired response. Consider the nature of the questions following the regression suggestion: (1) Can you tell me what you experienced when I told you that you were five years old, again? (2) Did you really feel like you were five years old? and (3) Did you have any sense of your adult identity? This sequence of questions proceeded from the general to specific properties of the experience, with more explicit cues being communicated to subjects as the questioning procedure progressed. One possible outcome of such explicit cuing is that subjects may give more elaborate response in the form of reporting more fine details of their experience. Future research should address the extent to which cuing and line of questioning affects the elaboration and number of such details.

The suggestion that incomplete responding amongst real subjects is a hallmark of honest and accurate reporting led to the prediction that these indices may predict compliance in the auditory paradigm. A related prediction could be made from the logical incongruity hypothesis; namely, that real hypnotic subjects who show trance logic responses are honestly reporting on the nature of

their experience and thus when subjected to pressures to bias their reporting, these subjects would resist the pressures to comply. We tested these alternative hypotheses and found that the incompleteness, but not the trance logic indices, predicted compliant responding in the auditory paradigm. Specifically, amongst real hypnotic subjects in the compliance condition, the three indices of trance logic (i.e., sentence errors, duality, and transparency) accounted for only 4.8% of the variance in trial 3 sound intensity changes. On the other hand, the four indices of incompleteness (i.e., regression qualifiers/descriptors and hallucination qualifiers/descriptors), together with the subjective experience indices accounted for 60% of the variance in trial 3 sound intensity changes. This finding suggests that compliance accounts for a large proportion of the individual differences in incomplete responding and intensity of subjective experience. This finding casts doubt on the accuracy of subjective reports proffered by subjects.

Examination of the zero-order r 's indicated that the number of regression descriptors was the best predictor of compliance on the third trial, $r(26) = -0.53$. That is, those subjects who reported more details of their regression experience reported greater sound reductions following the instruction to comply on the third trial in the auditory paradigm. These findings suggest that incomplete responses are indicators of honest responses and that subjects who respond in a relatively honest manner to traditional trance-logic suggestions will maintain such a pattern of responding under other task conditions.

All three trance logic indices failed to predict response to the compliance instruction on trial three of the auditory paradigm. These findings fail to support the prediction that trance logic responding is an index of honest and accurate reporting.

Individual Differences, Trance Logic and Compliance

It has been suggested that subjects with a penchant to become highly absorbed in "make-believe" situations tend to experience fewer shifts in perspective than those with less absorption abilities. One prediction from this hypothesis is that trait measures of absorption would be correlated with indices of trance logic. When we tested this hypothesis amongst real hypnotic subjects, we failed to support this hypothesis. Our trait measure of imagery vividness was equally poor at predicting trance logic responses. On the other hand, when absorption and vividness was assessed for each suggestion, we found that both absorption and vividness were negatively related to transparency of hallucination; subjects who were less absorbed (or had less vivid imagery) were more likely to describe their hallucinations as transparent. This finding suggests that situational factors, like the type of suggestion and pressures to comply, are critical in moderating the relationship between rated absorption and rated vividness and trance logic responding.

Trait measures of compliance and conformity were equally poor predictors of trance logic. Scores of the Crowne-Marlowe scale of Social Desirability, Cross-Situational Variability (CSV), and Attention to Social Comparison (ASC) were, by and large poor predictors of the five trance logic measures. There were small but significant relationships between ASC and both the double hallucination response and transparency response. Amongst real hypnotic subjects, those who avoid behaviours that depart extremely from the quantitative norm of a reference group are less likely to show the double hallucination response but more likely to show transparency of hallucination.

There were weak-to-nonexistent relationships between the above trait measures and compliance on trial 3. It appears that the strongest predictor of trial 3 sound change was reports of using distraction strategies. Subjects who reported spending more time

distracting themselves from the sound reported greater sound reductions. This finding indicates that subjects who exhibited the largest biases to the compliance instruction were the same people who were attuned to cues calling for strategy use in the rating questionnaires.

Conclusions

The present social psychological analysis suggests that previous suspicion regarding the veracity of hypnotic behaviours was understated. Behaviours traditionally characterized as hypnotic can be elicited through the manipulation of contextual cues that have nothing to do with hypnosis. Moreover, these behavioural markers seem to be less reflective of underlying changes in subjective experience than has heretofore been acknowledged. This conclusion does not suggest that university students are an unusually dishonest lot. Rather experimental situations create situational pressures which deem honest responses as appropriate. Inappropriate responses in such a context might conflict with subject's self-concept or the goals of the experimenter. Moreover, coupled with the ambiguity of the hypnotic experience, subjects look outside of themselves for cues on how to label their responses. Some subjects may respond to this situation by reinterpreting the memory of their trial 3 experience as less intense than they initially believed it to be; that is, on reflection of their experience, these subjects may simply conclude that "the sound wasn't that loud." Others might be purposefully deceptive when giving their reports. In either case, reporting biases in response to the the compliance instruction can be interpreted as a result of subjects' presenting themselves in a manner consistent with experimental demands.

For reals in the compliance condition, the reported sound reductions were consistently smaller (11%) following the compliance

trial, compared to the hypnotic trial (32%). The same pattern was shown by simulators who reported larger (58%) reductions in response to the hypnotic suggestion compared with the compliance instruction (27%). One plausible account for these results suggests that the reals' hypnotic responses involved more than a compliance-component. For example, the deafness suggestion encouraged subjects to use such strategies as self-distraction, positive imagery, cognitive reinterpretation, and positive self-statements (e.g., "the sound is less loud") which together may alter the experience of sound for subjects. Interpreted this way, subjects may genuinely experience perceptual changes in response to the hypnotic suggestion, but may exaggerate the amount because of pressures to respond with large experiential changes.

The compliance-paradigm proposed here proved to be effective in eliciting overt responses that were not reflective of experience. In doing so it qualifies as a reliable predictive tool for assessing reporting biases, as well as a valid comparative tool to assess the degree to which hypnotic responses may be biased by compliance. This does not suggest that the compliance-paradigm is a fool-proof lie detector; it is unlikely that such a technique or technology exists, or will ever exist. Methodological effects like this one here will always be limited by the problem that knowing the "truth" or accuracy of subjective experience is often not possible to observers, and may in fact be ambiguous to the subject's themselves. Orne's real-simulating paradigm, on the surface, appeared to circumvent this problem by encouraging subjects not to experience the suggested effects but overtly respond as if they had. However, as discussed earlier, this method fails to equate reals and simulators on task demands; in fact, simulation instructions profoundly alter demand characteristics.

There are inherent difficulties in every method of discerning deception and compliance. For example, paper-and-pencil honesty

tests and polygraph tests face the same problem; one can never be sure of the criterion, because lies by definition are maintained as secrets (Saxe, 1991). These limitations do not mean methodological efforts such as the present one are useless. On the contrary, that reporting bias plays such a critical role in the responses of high hypnotizable hypnotic subjects suggests that such responses are closely tied to features of the situation. Future cross-paradigm research might benefit from examining the interaction of both hypnotizability and demand pressures on reporting biases in these contexts; for example, the use of low, medium and high hypnotizable subjects exposed to varying pressures of comply across a range of test suggestions.

References

- Adair, J. G., & Spinner, B. (1979). Subjects' access to cognitive processes: Demand characteristics and verbal report. *Journal of Theory in Social Behavior*, 11, 31-52.
- Aronson, E. (1977). *The social animal*. San Francisco: Freeman.
- Asch, S. E. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice Hall.
- Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgement. In H. Guetzhof (Ed.), *Groups, leadership, and men*. Pittsburgh, PA: Carnegie Press.
- Austin, M., Perry, C., & Sutcliffe, J. P. (1963). Can somnambulists successfully simulate hypnotic behavior without becoming hypnotized. *The International Journal of Clinical and Experimental Hypnosis*, 11, 175-186.
- Barber, T. X. (1979) Suggested ("hypnotic") behavior: The trance paradigm versus an alternative paradigm. In E. Fromm & R. E. Shor, (Eds.), *Hypnosis: Developments in research and new perspectives*, (pp. 217-271). New York: Aldine.
- Barber, T. X. (1970). *L.S.D., marihuana, yoga, and hypnosis*. Chicago: Aldine.
- Barber, T. X. (1969). *Hypnosis: A scientific approach*. New York: Van Nostrand Reinhold.
- Barber, T. X. (1964a). Hypnotizability, suggestibility, and personality: V. A critical review of research findings. *Psychological Reports*, 14, 299-320.
- Barber, T. X. (1964b). "Hypnosis" as a causal variable in present-day psychology: A critical analysis. *Psychological Reports*, 14, 839-842.

- Barber, T. X. (1962). Experimental controls and the phenomena of "hypnosis": A critique of hypnotic research methodology. *Journal of Nervous and Mental Disease*, 134, 493-505.
- Barber, T. X. & Calverley, D. S. (1964a). The definition of the situation as a variable affecting "hypnotic-like" suggestibility. *Journal of Clinical Psychology*, 20, 438-440.
- Barber, T. X., & Calverley, D. S. (1964b). Empirical evidence for a theory of "hypnotic" behavior: Effects of pretest instructions on response to primary suggestions. *Psychological Record*, 14, 457-467.
- Barber, T. X., & Calverley, D. S. (1964c). Experimental studies in hypnotic behavior: Suggested deafness evaluated by delayed auditory feedback. *British Journal of Psychology*, 55, 439-446.
- Barber, T. X., & Calverley, D. S. (1964d). An experimental study of "hypnotic" (auditory and visual) hallucinations. *Journal of Abnormal and Social Psychology*, 68, 13-20.
- Barber, T. X., Spanos, N. P., & Chaves, J. F. (1974). *Hypnosis, imagination, and human potentialities*. Elmsford, NY: Pergamon Press.
- Barber, T. X. & Wilson, S. C. (1977). Hypnosis, suggestions and altered states of consciousness: Experimental evaluation of the new cognitive-behavioral theory and the traditional trance-state theory of "hypnosis". *Annals of the New York Academy of the Sciences*, 296, 34-47.
- Bem, D. J. L. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6). New York: Academic Press.
- Bertrand, L. D., Spanos, N. P. (1986). Effects of instructing subjects to pretend forgetting on disorganized recall. *Psychological Reports*, 58, 483-490.

- Black, S., & Wigan, E. R. (1961). An investigation of selected deafness produced by direct suggestion under hypnosis. *British Medical Journal*, 2, 736-741.
- Blum, G. S., & Graef, J. R. (1971). The detection over time of subjects simulating hypnosis. *The International Journal of Clinical and Experimental Hypnosis*, 19, 211-224.
- Bowers, K. S. (1981). Do the Stanford scales tap the classic suggestion effect? *International Journal of Clinical and Experimental Hypnosis*, 31, 293-308.
- Bowers, K. S. (1976). *Hypnosis for the seriously curious*. Monterey, CA: Brooks/Cole.
- Bowers, K. S. (1967). The effect of demands for honesty on reports of visual and auditory hallucinations. *The International Journal of Clinical and Experimental Hypnosis*, 15, 31-36.
- Bowers, K. S. (1966). Hypnotic behavior: The differentiation of trance and demand characteristic variables. *Journal of Abnormal Psychology*, 71, 42-51.
- Bowers, P. (1986). Understanding reports of nonvolition [Open Peer Commentary]. *Behavioral and Brain Sciences*, 9, 469-470.
- Brown, J., Chaves, J. F., & Leonoff, J. (1981). *Spontaneous hypnotic strategies in two groups of chronic pain patients*. Paper presented at the 89th Annual Meeting of the American Psychological Association. Los Angeles, California.
- Calverley, D. S., & Barber, T. X. (1965). "Hypnosis" and antisocial behavior: An experimental evaluation. Harding, MA: Medfield Foundation. (Mimeo). Cited by Barber (1969).
- Chaves, J. F. (1989). Hypnotic control of clinical pain. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp. 242-272). Buffalo, NY: Prometheus.
- Chaves, J. F. (1968). Hypnosis reconceptualized: An overview of Barber's theoretical and empirical work. *Psychological Reports*, 22, 587-608.

- Chaves, J. F., & Barber, T. X. (1976). Hypnotic procedures and surgery: A critical analysis with applications to "acupuncture analgesia". *American Journal of Clinical Hypnosis*, 18, 217-236.
- Coe, W. C. (1989). Posthypnotic amnesia: Theory and research. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp. 110-148). Buffalo, NY: Prometheus.
- Coe, W. C. (1966). *Interpretation of hypnotic factors as representing a continuous behavior*. Paper presented at the Annual Meeting of the California Psychological Association. San Francisco, CA.
- Coe, W. C., Kobayashi, K., & Howard, M. L. (1973). Experimental and ethical problems of evaluating the influence of hypnosis in antisocial conduct. *Journal of Abnormal Psychology*, 82, 472-482.
- Coe, W. C., Kobayashi, K., & Howard, M. L. (1972). An approach toward isolating factors that influence antisocial conduct in hypnosis. *The International Journal of Clinical and Experimental Hypnosis*, 20, 118-131.
- Coe, W. C., & Sarbin, T. R. (1977). Hypnosis from the standpoint of a contextualist. *Annals of the New York Academy of the Sciences*, 296, 2-13.
- Coe, W. C. & Tucibat, M. (1988). The effects of two breaching conditions on posthypnotically amnesic subjects. Cited by W. C. Coe 1989.
- Coe, W. C., & Yashinski, E. (1985). Breaching posthypnotic amnesia: Volitional experiences and their correlates. *Journal of Personality and Social Psychology*, 48, 716-722.
- Cook, T. D., Bean, J. R., Calder, B. J., Frey, R., Krovetz, M. L., & Reisman, S. R. (1970). Demand characteristics and three conceptions of the frequently deceived subject. *Journal of Personality and Social Psychology*, 14, 185-194.
- Crawford, H. J., MacDonald, H., & Hilgard, E. R. (1979). Hypnotic deafness: A psychophysical study of responses to tone intensity

- as modified by hypnosis. *American Journal of Psychology*, 92, 193-214.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.
- Crutchfield, R. S. (1955). Conformity and character. *American Psychologist*, 10, 191-198.
- Darnton, R. (1968). *Mesmerism and the end of the enlightenment in France*. Cambridge, MA: Harvard University Press.
- D'Eon, J. L. (1989). Hypnosis in the control of labor pain. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp. 273-296). Buffalo, NY: Prometheus.
- DePaulo, B. M. (1981). Success at detecting deception: Liability or skill. *Annals of the New York Academy of the Sciences*, 364, 245-255.
- Dorcus, R. M., Brintall, A. K., & Case, H. W. (1941). Control experiments and their relation to theories of hypnotism. *Journal of General Psychology*, 24, 217-221.
- Ekman, P. (1981). Mistakes when deceiving. *Annals of the New York Academy of the Sciences*, 364, 269-278.
- Erickson, M. H. (1938). A study of clinical and experimental findings on hypnotic deafness: I. Clinical experimentation and findings. *Journal of General Psychology*, 19, 127-150.
- Evans, F. J. (1985). Expectancy, therapeutics instructions, and the placebo response. In L. White, B. Tursky & G. E. Schwartz (Eds.), *Placebo: Theory, research, and mechanisms* (pp. 215-228). New York: Guilford Press.
- Evans, F. J. (1968). Recent trends in experimental hypnosis. *Behavioral Science*, 13, 477-487.
- Evans, F. J., & Orne, M. T. (1971). The disappearing hypnotist: The use of simulating subjects to evaluate how subjects perceive

- experimental procedures. *The International Journal of Clinical and Experimental Hypnosis*, 19, 277-296.
- Evans, F. J., & Schmeidler, D. (1966). Relationship between the Harvard Group Scale of Hypnotic Susceptibility and the Stanford Hypnotic Susceptibility Scale: Form C. *International Journal of Clinical and Experimental Hypnosis*, 14, 333-343.
- Farthing, G. W., Brown, S. W., & Venturino, M. (1982). Effects of hypnotizability and mental imagery on signal detection sensitivity and response bias. *International Journal of Clinical and Experimental Hypnosis*, 30, 289-305.
- Fiedler, K. (1989). Suggestion and credibility: Lie detection based on content-related cues. In V. A. Gheorghiu, P. Netter, H. J. Eysenck, & R. Rosenthal (Eds.), *Suggestion and suggestibility: Theory and research* (pp.323-336). Berlin, FRG: Springer-Verlag.
- Fillenbaum, S. (1966). Prior deception and subsequent experimental performance: The "faithful" subject. *Journal of Personality and Social Psychology*, 4, 532-537.
- Frank, D. P. (1944). Experimental studies of personal pressure and resistance: 1. Experimental production of resistance. *Journal of General Psychology*, 30, 23-41.
- Franklin, B. et al. (1785). Report of Dr. Benjamin Franklin and the other commissioners, charged by the King of France, with the examination of the animal magnetism, as now practised at Paris. Translated from the French, with an historical introduction (by William Godwin). In M. M. Tinterow (Ed.), *Foundation of hypnosis: From Mesmer to Freud*. Springfield, Illinois: Thomas, 1970.
- Friedlander, J. W., & Sarbin, T. R. (1938). The depth of hypnosis. *Journal of Abnormal and Social Psychology*, 33, 453-475.
- Goffman, E. (1959). *The presentation of self in everyday life*. New York: Doubleday.

- Graham, K. R., & Greene, L. D. (1981). Hypnotic susceptibility related to an independent measure of compliance--Alumni annual giving. *The International Journal of Clinical and Experimental Hypnosis*, 29, 351-354.
- Graham, K. R., & Schwartz, L. M. (1973). *Suggested deafness and auditory signal detectability*. Paper presented at the 81st Annual Meeting of the American Psychological Association.
- Green, D. M., & Swets, J. A. (1966). *Signal detection theory and psychophysics*. New York: Wiley.
- Gregg, V. H., & Mingay, D. J. (1987). Influence of hypnosis on riskiness and discriminability in recognition memory for faces. *British Journal of Experimental and Clinical Hypnosis*, 4, 65-76.
- Gregg, V. H., & Whitely, A. E. (1985). Hypnosis and signal detection theory: Reservations concerning Naish's theory. *British Journal of Experimental and Clinical Hypnosis*, 2, 139-141.
- Gwynn, M. I., Spanos, N. P., Gabora, N. J., & Jarrett, L. E. (1988). Long term and short term follow-up on the Harvard Group Scale of Hypnotic Susceptibility: Form A. *British Journal of Experimental and Clinical Hypnosis*, 3, 117-124.
- Hilgard, E. R. (1979). Divided consciousness in hypnosis: The implications of the hidden observer. In E. Fromm & R. E. Shor (Eds.), *Hypnosis: Developments in research and new perspectives* (pp. 45-79). New York: Aldine.
- Hilgard, E. R. (1977). The problem of divided consciousness: A neodissociation interpretation. *Annals of the New York Academy of the Sciences*, 296, 48-59.
- Hilgard, E. R. (1974). Toward a neo-dissociation theory: Multiple cognitive controls in human functioning. *Perspectives in Biology and Medicine*, 17, 301-316.
- Hilgard, E. R. (1973). The domain of hypnosis, with some comments on alternative paradigms. *American Psychologist*, 28, 972-982.

- Hilgard, E. R. (1969). Pain as a puzzle for psychology and physiology. *American Psychologist*, 24, 103-113.
- Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York: Harcourt, Brace, & World.
- Hilgard, E. R., Hilgard, J. R., MacDonald, H., Morgan, A. H., & Johnson, L. S. (1978). Covert pain in hypnotic analgesia: Its reality as tested by the real-simulator paradigm. *Journal of Abnormal Psychology*, 87, 655-663.
- Hilgard, E. R., & Loftus, E. F. (1979). Effective interrogation of the eyewitness. *The International Journal of Clinical and Experimental Hypnosis*, 27, 342-357.
- Hilgard, E. R., & Tart, C. T. (1966). Responsiveness to suggestions following waking and imagination instructions and following induction of hypnosis. *Journal of Abnormal Psychology*, 71, 196-208.
- Howard, M. L., & Coe, W. C. (1980). The effects of context and subjects' perceived control in breaching posthypnotic amnesia. *Journal of Personality*, 48, 342-359.
- Hull, C. L. (1933). *Hypnosis and suggestibility: An experimental approach*. New York: Appleton-Century-Crofts.
- Hunt, S. M. (1979). Hypnosis as obedience behavior. *British Journal of Social and Clinical Psychology*, 18, 21-27.
- Johnson, R. F. Q., Maher, B. A., & Barber, T. X. (1972). Artifact in the "essence of hypnosis": An evaluation of trance logic. *Journal of Abnormal Psychology*, 79, 212-220.
- Jones, B., & Flynn, D. M. (1989). Methodological and theoretical considerations in the study of "hypnotic" effects in perception. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioural perspective* (pp.149-174). Buffalo, NY: Prometheus.
- Jones, B., & Spanos, N. P. (1982). Suggestions for altered auditory sensitivity, the negative subject effect and hypnotic

- susceptibility: A signal detection analysis. *Journal of Personality and Social Psychology*, 43, 637-647.
- Jones, E. E., & Nisbett, R. E. (1972). The actor and the observer: Divergent perceptions of the causes of behaviour. In E. E. Jones et al., (Eds.), *Attribution: Perceiving the causes of behavior*. Morristown, NJ: General Learning Press.
- Kiesler, C. A., & Kiesler, S. B. (1970). *Conformity*. Reading, MA: Addison-Wesley.
- Kihlstrom, J. F. (1986). Strong inferences about hypnosis [Open Peer Commentary]. *Behavioral and Brain Sciences*, 9, 474-475.
- Kihlstrom, J. F. (1978). Context and cognition in posthypnotic amnesia. *International Journal of Clinical and Experimental Hypnosis*, 26, 246-267.
- Kihlstrom, J. F., Evans, F. J., Orne, E. C., & Orne, M. T. (1980). Attempting to breach posthypnotic amnesia. *Journal of Abnormal Psychology*, 89, 603-616.
- Kirsch, I., Silva, C. E., Carone, J. E., Johnston, J. D., & Simon, B. (1989). The surreptitious observation design: An experimental paradigm for distinguishing artifact from essence in hypnosis. *Journal of Abnormal Psychology*, 98, 132-136.
- Kline, M. V., Guze, H., & Haggerty, A. D. (1954). An experimental study on the nature of hypnotic deafness: Effects of delayed speech feedback. *International Journal of Clinical and Experimental Hypnosis*, 2, 145-156.
- Korotin, I. I., Pleshkova, T. V., & Suslova, M. M. (1968). Change in auditory thresholds as the result of hypnotic suggestion. *Soviet Neurology and Psychiatry*, 1, 33-40.
- Kramer, E., & Tucker, G. R. (1967). Hypnotically suggested deafness and delayed auditory feedback. *International Journal of Clinical and Experimental Hypnosis*, 15, 37-43.
- Labelle, L., Laurence, I-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. (1979). *Duality and dissociation in hypnosis*. Unpublished master's thesis, Concordia University, Montreal, Canada.
- Laurence, J-R, & Perry, C. (1989). *Hypnosis, will and memory: A psycho-legal history*. New York: Guilford Press.
- Laurence, J-R, & Perry, C. (1983). Hypnotically created memories among highly hypnotizable subjects. *Science*, 222, 523-524.
- Laurence, J-R, & Perry, C. (1981). The "hidden observer" phenomenon in hypnosis: Some additional findings. *Journal of Abnormal Psychology*, 90, 334-344.
- Lennox, R. D., & Wolfe, R. N. (1984). Revision of the Self-Monitoring Scale. *Journal of Personality and Social Psychology*, 46, 1349-1364.
- Levitt, E. E., Arnoff, G., Morgan, C. D., Overley, T. M., & Parrish, M. J. (1975). Testing the coercive power of hypnosis: Committing objectionable acts. *International Journal of Clinical and Experimental Hypnosis*, 23, 59-67.
- Levitt, E. E., & Overley, T. M. (1971). A comparison of the performance of hypnotic subjects and simulators on a variety of measures: A pilot study. *The International Journal of Clinical and Experimental Hypnosis*, 19, 234-242.
- Loftus, E. F. (1979). *Eyewitness testimony*. Cambridge, MA: Harvard University Press.
- Lykken, D. T. (1974). Psychology and the lie detector industry. *American Psychologist*, 29, 725-739.
- Lynn, S. J., Nash, M. R., Carlson, V., Sweeny, C. A., Frauman, D., & Givens, D. (1985). Nonvolition and hypnosis: Experimental and behavioral differences in response to conflicting suggestions during hypnosis. In D. Waxman, P. C. Mistra, M. Gibson, & M. A. Basker (Eds.), *Modern trends in hypnosis*. New York: Plenum.

- Lynn, S. J., Weekes, J. R., & Milano, M. J. (1989). Reality versus suggestion: Pseudomemory in hypnotizable and simulating subject. *Journal of Abnormal Psychology*, 98, 137-144.
- Mandy, A. J., Mandy, T. E., Farkas, R., & Scher, E. (1952). Is natural childbirth natural? *Psychosomatic Medicine*, 14, 431-438.
- Marcuse, F. L. (1976). *Hypnosis: Fact and fiction*. Harmondsworth, UK: Penguin.
- McCann, T. E., & Sheehan, P. W. (1988). Hypnotically induced pseudomemories: Sampling their conditions among hypnotizable subjects. *Journal of Personality and Social Psychology*, 54, 239-346.
- McCann, T. E., & Sheehan, P. W. (1985-1986). The breaching of pseudomemory under hypnotic instruction: Implications for original memory retrieval. *British Journal of Experimental and Clinical Hypnosis*, 3, 101-108.
- McConkey, K. M., & Sheehan, P. W. (1980). Inconsistency in hypnotic age regression and cue structure as supplied by the hypnotist. *The International Journal of Clinical and Experimental Hypnosis*, 28, 394-408.
- McConkey, K. M., & Sheehan, P. W. (1981). The impact of videotape playback of hypnotic events on posthypnotic amnesia. *Journal of Abnormal Psychology*, 90, 46-54.
- McConkey, K. M., Sheehan, P. W., & Cross, D. G. (1980). Posthypnotic amnesia: Seeing is not remembering. *British Journal of Social and Clinical Psychology*, 19, 99-107.
- McDonald, R. D., & Smith, J. R. (1975). Trance logic in tranceable and simulating subjects. *The International Journal of Clinical and Experimental Hypnosis*, 23, 80-89.
- Meehl, P. E., & Hathaway, S. R. (1946). The K factor as a suppressor variable in the MMPI. *Journal of Applied Psychology*, 30, 525-564.

- Milgram, S. (1964). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 67, 371-378.
- Mingay, D. J. (1986). Hypnosis and memory for incidentally learned scenes. *British Journal of Experimental and Clinical Hypnosis*, 3, 173-183.
- Moore, R. K. (1964). Susceptibility to hypnosis and susceptibility to social influence. *Journal of Abnormal and Social Psychology*, 69, 282-294.
- Morgan, A. H., Johnson, L. S., & Hilgard, E. R. (1974).
- Naish, P. L. N. (1986). Hypnosis and signal detection: An information-processing account. In P. L. N. Naish (Ed.), *What is hypnosis? Current theories and research (pp.121-144)*. Milton Keynes, UK: Open University Press.
- Naish, P. L. N. (1983). *Hypnosis: A signal detection approach*. Paper presented at the Annual Meeting of the Experimental Psychology Society. London, UK.
- Neisser, U. (1979). Is psychology ready for consciousness. *Contemporary Psychology*, 24, 99-100.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.
- Nogard, H., McConkey, K. M., Laurence, J-R, & Perry, C. (1983). Dissociation, duality, and demand characteristics in hypnosis. *Journal of Abnormal Psychology*, 92, 223-235.
- Obstoj, I., & Sheehan, P. W. (1977). Aptitude for trance, task generalizability, and incongruity in hypnosis. *Journal of Abnormal Psychology*, 86, 543-552.
- Orne, M. T. (1981). The significance of unwitting cues for experimental outcomes: Toward a pragmatic approach. *Annals of the New York Academy of the Sciences*, 364, 152-168.
- Orne, M. T. (1979a). On the simulating subject as a quasi-control group in hypnosis research: What, why, and how. In E. Fromm

- & R. E. Shor (Eds.), *Hypnosis: Developments in research and new perspectives*, (pp. 519-565). New York: Aldine.
- Orne, M. T. (1979b). The use and misuse of hypnosis in court. *The International Journal of Clinical and Experimental Hypnosis*, 27, 311-341.
- Orne, M. T. (1977). The construct of hypnosis: Implications of the definition for research and practice. *Annals of the New York Academy of the Sciences*, 296, 14-33.
- Orne, M. T. (1971). The simulation of hypnosis: Why, how, and what it means. *The International Journal of Clinical and Experimental Hypnosis*, 19, 183-210.
- Orne, M. T. (1969). Demand characteristics and the concept of quasi-controls. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in behavioral research* (pp. 143-179). New York: Academic.
- Orne, M. T. (1966). Hypnosis, motivation, and compliance. *American Journal of Psychiatry*, 122, 721-726.
- Orne, M. T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, 17, 776-783.
- Orne, M. T. (1959). The nature of hypnosis: Artifact and essence. *Journal of Abnormal and Social Psychology*, 58, 277-299.
- Orne, M. T. (1951). The mechanisms of hypnotic age regression: An experimental study. *Journal of Abnormal and Social Psychology*, 46, 213-225.
- Orne, M. T., & Evans, F. J. (1965). Social control in the psychological experiment. *Journal of Personality and Social Psychology*, 1, 189-200.
- Orne, M. T., & Hammer, A. G. (1974). Hypnosis. *Encyclopedia Britannica*. (15th Ed.)(pp. 133-140). Chicago, IL: William Benton.

- Orne, M. T., & O'Connell, D. N. (1967). Diagnostic ratings of hypnotizability. *The International Journal of Clinical and Experimental Hypnosis*, 15, 125-133.
- Orne, M. T., Sheehan, P. W., & Evans, F. J. (1968). Occurrence of posthypnotic behavior outside of the experimental setting. *Journal of Personality and Social Psychology*, 4, 189-196.
- Pattie, F. A. (1950). The genuineness of unilateral deafness produced by hypnosis. *American Journal of Psychology*, 63, 84-86.
- Pennebaker, J. W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.
- Perry, C., & Walsh, B. (1978). Inconsistencies and anomalies of response as a defining characteristic of hypnosis. 574-577.
- Peters, J. E. (1973). *Trance logic: Artifact or essence in hypnosis*. Unpublished doctoral dissertation, Pennsylvania State University.
- Podomore, F. (1964). *From Mesmer to Christian Science. A short history of mental healing*. New Hyde Park, NY: University Books (Originally published in 1909).
- Putnam, W. H. (1979). Hypnosis and distortions in eyewitness memory. *International Journal of Clinical and Experimental Hypnosis*, 27, 437-448.
- Radtke, H. L., & Spanos, N. P. (1981). Was I hypnotized? A social psychological analysis of hypnotic depth reports. *Psychiatry*, 44, 359-376.
- Rosenberg, M. J. (1969). The conditions and consequences of evaluation apprehension. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in behavioral research* (pp.279-349). New York: Academic.
- Sarbin, T. R. (1981). On self-deception. *Annals of the New York Academy of the Sciences*, 364, 220-235.
- Sarbin, T. R. (1984). Nonvolition in hypnosis: A semiotic analysis. *The Psychological Record*, 34, 537-549.

- Sarbin, T. R. (1950). Contributions to role-taking theory: I. Hypnotic behavior *The Psychological Review*, 57, 255-270.
- Sarbin, T. R., & Coe, W. C. (1972). *Hypnosis: A social psychological analysis of influence communication*. New York: Holt, Rinehart & Winston.
- Sarbin, T. R., & Slagle, R. W. (1979). Hypnosis and psychophysiological outcomes. In E. Fromm & R. E. Shor (Eds.), *Hypnosis: Developments in research and new perspectives*, (pp. 273-303). New York: Aldine.
- Saxe, L. (1990). Lying: Thoughts of an applied social psychologist. *American Psychologist*, 46, 409-415.
- Scheibe, K. E., Gray, A. L., & Keim, C. S. (1968). Hypnotically induced deafness and delayed auditory feedback: A comparison of real and simulating subjects. *International Journal of Clinical and Experimental Hypnosis*, 16, 158-164.
- Schuyler, B. A., & Coe, W. C. (1981). A physiological investigation of volitional and nonvolitional experience during posthypnotic amnesia. *Journal of Personality and Social Psychology*, 40, 1160-1169.
- Shames, M. L. (1981). Hypnotic susceptibility and conformity: On the mediational mechanism of suggestibility. *Psychological Reports*, 49, 563-566.
- Sheehan, P. W. (1977). Incongruity in trance behavior: A defining property of hypnosis. *Annals of the New York Academy of the Sciences*, 296, 194-207.
- Sheehan, P. W. (1973). Analysis of the heterogeneity of "faking" and "simulating" performance in the hypnotic setting. *The International Journal of Clinical and Experimental Hypnosis*, 21, 213-225.
- Sheehan, P. W. (1971a). Task structure as a limiting condition of the occurrence of the treatment effects of simulation instruction in application of real-simulating model of hypnosis. *The*

- International Journal of Clinical and Experimental Hypnosis*, 19, 260-276.
- Sheehan, P. W. (1971b). A methodological analysis of the simulating technique. *The International Journal of Clinical and Experimental Hypnosis*, 19, 83-99.
- Sheehan, P. W. (1970). Analysis of the treatment effects of simulation instructions in the application of the real-simulating model of hypnosis. *Journal of Abnormal Psychology*, 75, 98-103.
- Sheehan, P. W., & Dolby, R. M. (1974). Artifact and Barber's model of hypnosis: A logical-empirical analysis. *Journal of Experimental Social Psychology*, 10, 171-187.
- Sheehan, P. W., McConkey, K. M., & Cross, D. (1978). Experiential analysis of hypnosis: Some new observations on hypnotic phenomena. *Journal of Abnormal Psychology*, 87, 570-573.
- Sheehan, P. W., Obstoj, I., & McConkey, K. M. (1976). Trance logic and cue structure as supplied by the hypnotist. *Journal of Abnormal Psychology*, 85, 570-573.
- Sheehan, P. W., & Perry, C. W. (1976). *Methodologies of hypnosis: A critical appraisal of contemporary paradigms of hypnosis*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Sheehan, P. W., Smith, H. V., & Forrest, D. W. (1982). A signal detection study of the effects of suggested improvement on monocular visual acuity of myopes. *International Journal of Clinical and Experimental Hypnosis*, 30, 138-146.
- Sheehan, P. W., & Tilden, J. (1983). Effects of suggestibility and hypnosis on accurate and distorted retrieval from memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9, 283-293.
- Shor, R. E. (1979). The fundamental problem in hypnosis research as viewed from historic perspectives. In E. Fromm & R. E. Shor (Eds.), *Hypnosis: Developments in research and new perspectives* (pp. 15-41) (2nd Ed.). New York: Aldine.

- Shor, R. E. (1959). Hypnosis and the concept of the generalized reality-orientation. *American Journal of Psychotherapy*, 13, 582-602.
- Shor, R. E., & Orne, E. C. (1962). *Harvard Group Scale of Hypnotic Susceptibility, Form A*. Palo Alto, CA: Consulting Psychologists Press.
- Shor, R. E., Orne, M. T., & O'Connell, D. N. (1966). Psychological correlates of plateau hypnotizability in a special volunteer sample. *Journal of Personality and Social Psychology*, 3, 80-95.
- Sigman, A., Phillips, K. C., & Clifford, B. (1985). Attentional concomitants of hypnotic susceptibility. *British Journal of Experimental and Clinical Hypnosis*, 2, 69-75.
- Sluis, A., & Coe, W. C. (1987). Posthypnotic amnesia: Findings on breaching, volition and the dissipation hypothesis. Cited by W. C. Coe, Posthypnotic amnesia: Theory and research.
- Smith, M. C. (1983). Hypnotic memory enhancement of witnesses: Does it work? *Psychological Bulletin*, 94, 287-407.
- Spanos, N. P. (1989). Experimental research on hypnotic analgesia. In N. P. Spanos & J. F. Chaves, (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp.206-240). Buffalo, NY: Prometheus.
- Spanos, N. P. (1986a). Hypnosis and the modification of hypnotic susceptibility: A social psychological perspective. In P. L. N. Naish (Ed.), *What is Hypnosis? Current Theories and Research* (pp. 85-120). Milton Keynes, UK: Open University Press.
- Spanos, N. P. (1986b). Hypnotic behavior: A social-psychological interpretation of amnesia, analgesia, and "trance logic". *Behavioral and Brain Sciences*, 9, 449-467.
- Spanos, N. P. (1986c). More on the social psychology of hypnotic responding [Author's response]. *Behavioral and Brain Sciences*, 9, 489-497.
- Spanos, N. P., & Barber, T. X. (1974). Toward a convergence in hypnosis research. *American Psychologist*, 500-511.

- Spanos, N. P., & Barber, T. X. (1968). "Hypnotic" experiences as inferred from auditory and visual hallucinations. *Journal of Experimental Research in Personality*, 3, 136-150.
- Spanos, N. P., Barber, T. X., & Lang, G. (1974). Cognition and self-control: Cognitive control of painful sensory input. In H. Condon & R. E. Nisbett (Eds.), *Thought and feeling: Cognitive alteration of feeling states* (pp. 144-158). Chicago: Aldine.
- Spanos, N. P., Bridgeman, M., Stam, H. J., Gwynn, M. I., & Saad, C. I. (1982). When seeing is not believing: The effects of contextual variables on the reports of hypnotic hallucinations. *Imagination, Cognition, and Personality*, 2, 195-209.
- Spanos, N. P., Burgess, C. A., & Perlini, A. H. (1990). Compliance and suggested in hypnotic and nonhypnotic subjects. *Unpublished manuscript, Carleton University*.
- Spanos, N. P., & Chaves, J. F. (1989). Introduction: The cognitive-behavioral alternative in hypnosis research. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp. 9-16). Buffalo, NY: Prometheus.
- Spanos, N. P., Cobb, P. C., & Gwynn, M. I. (1984). The Carleton University Responsiveness to suggestion scale: Stability and reliability under conditions of individual administration. *Psychological Reports*, 54, 123-128.
- Spanos, N. P., & deGroh, M. (1983). Structure of communication and reports of involuntariness by hypnotic and nonhypnotic subjects. *Perceptual and Motor Skills*, 57, 1179-1186.
- Spanos, N. P., deGroot, H. P., Tiller, D. K., Weekes, J. R., & Bertrand, L. D. (1985). Trance logic duality and hidden observer responding in hypnotic, imagination control, and simulating subjects: A social psychological analysis. *Journal of Abnormal Psychology*, 94, 611-623.

- Spanos, N. P., deGroot, H. P., & Gwynn, M. I. (1987). Trance logic as incomplete responding. *Journal of Personality and Social Psychology*, 53, 911-921.
- Spanos, N. P., & Gottlieb, J. (1979). Demonic possession, mesmerism, and hysteria: A social psychological perspective on their historical interrelations. *Journal of Abnormal Psychology*, 88, 527-546.
- Spanos, N. P., Gwynn, M. I., Comer, S. L., Baltruweit, W. J., & deGroh, M. (1989). Are hypnotically induced pseudomemories resistant to cross-examination. *Law and Human Behavior*, 13, 271-289.
- Spanos, N. P., Gwynn, M. I., & Stam, H. J. (1983). Instructional demands and rating of overt and hidden pain during hypnotic analgesia. *Journal of Abnormal Psychology*, 92, 322-329.
- Spanos, N. P., & Hewitt, E. C. (1980). The hidden observer in hypnotic analgesia: Discovery or experimental creation? *Journal of Personality and Social Psychology*, 39, 1201-1214.
- Spanos, N. P., Hodgins, D. C., Stam, H. J., & Gwynn, G. I. (1984). Suffering for science: The effects of implicit social demands on response to experimentally induced pain. *Journal of Personality and Social Psychology*, 46, 1162-1172.
- Spanos, N. P., Jones, B., & Malfara, A. (1982). Hypnotic deafness: Now you hear it--Now you still hear it. *Journal of Abnormal Psychology*, 91, 75-77.
- Spanos, N. P., Lush, N. I., Smith, J. E., & deGroh, M. (1986). Effects of two hypnotic induction procedures on overt and subjective response to two measures of hypnotic susceptibility. *Psychological Reports*, 59, 1227-1230.
- Spanos, N. P., & McLean, J. (1985). Hypnotically created pseudomemories: Memory distortions or reporting biases? *British Journal of Experimental and Clinical Hypnosis*, 3, 155-159.

- Spanos, N. P., Mullens, D., & Rivers, S. M. (1979). The effects of suggestion structure and hypnotic vs task-motivation instructions on responses to hallucination suggestions. *Journal of Research in Personality, 13*, 59-70.
- Spanos, N. P., Perlini, A. H., Patrick, L., Bell, S., & Gwynn, M. I. (1990). The role of compliance in hypnotic and nonhypnotic analgesia. *Journal of Research in Personality.*
- Spanos, N. P., & Radtke, H. L. (1981). Hypnotic visual hallucinations as imaginings: A cognitive-social psychological perspective. *Imagination, Cognition, and Personality, 1*, 147-170.
- Spanos, N. P., Radtke, H. L., Hodgins, D. C., Bertrand, L. D., Stam, H. J., & Dubreuil, D. L. (1983a). The Carleton University Responsiveness to Suggestion Scale: Stability, reliability, and relationships with expectancy and hypnotic experiences. *Psychological Reports, 53*, 555-563.
- Spanos, N. P., Radtke, H. L., Hodgins, D. C., Bertrand, L. D., Stam, H. J., & Moretti, P. (1983b). The Carleton University Responsiveness to Suggestion Scale: Relationships with other measures of hypnotic susceptibility, expectancies, and absorption. *Psychological Reports, 53*, 723-734.
- Spanos, N. P., Radtke, H. L., Hodgins, D. C., Stam, H. J., & Bertrand, L. D. (1983c). The Carleton University Responsiveness to Suggestion Scale: Normative data and psychometric properties. *Psychological Reports, 53*, 523-535.
- Spanos, N. P., Rivers, S. M., & Ross, S. (1977). Experienced involuntariness and response to hypnotic suggestions. *Annals of the New York Academy of the Sciences, 296*, 208-221.
- Spanos, N. P., Salas, J. A., Menary, E. P., & Brett, P. J. (1986). A comparison of overt and subjective responses to the Carleton University Responsiveness to Suggestion Scale and the Stanford Hypnotic Susceptibility Scale under conditions of group administration. *Psychological Reports, 58*, 847-856.

- Stam, H. J. (1989). From symptom relief to cure: Hypnotic Interventions in cancer. In N. P. Spanos & J. F. Chaves, (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp.297-313). Buffalo, NY: Prometheus.
- Stam, H. J., & Spanos, N. P. (1980). Experimental designs, expectancy effects, and hypnotic analgesia. *Journal of Abnormal Psychology*, 89, 551-559.
- Stanley, S. M., Lynn, S. J., & Nash, M. R. (1986). Trance logic, susceptibility screening, and the transparency response. *Journal of Personality and Social Psychology*, 50, 447-454.
- Sutcliffe, J. P. (1961). "Credulous" and "skeptical" views of hypnotic phenomena: Experiments in esthesia, hallucination, and delusion. *Journal of Abnormal and Social Psychology*, 62, 189-200.
- Tart, C. T., & Hilgard, E. R. (1966). Responsiveness to suggestions under "hypnosis" and "waking-imagination" conditions: A methodological observation. *International Journal of Clinical and Experimental Hypnosis*, 14, 247-256.
- Tellegan, A. (1982). *Differential Personality Questionnaire*. University of Minnesota.
- Wadden, T. A., & Anderton, C. H. (1982). The clinical use of hypnosis. *Psychological Bulletin*, 91, 215-243.
- Wagstaff, G. F. (1986). Hypnosis as compliance and belief: a socio-cognitive view. In P. L. N. Naish, *What is hypnosis? Current theories and research* (pp.59-84). Milton Keynes, UK: Open University Press.
- Wagstaff, G. F. (1981). *Hypnosis, compliance and belief*. New York: St. Martin's Press.
- Wagstaff, G. F. (1977). An experimental study of compliance and post-hypnotic amnesia. *British Journal of Social and Clinical Psychology*, 16, 225-228.

- Wagstaff, G. F., & Benson, D. (1987). Exploring hypnotic processes with the cognitive-simulator comparison group. *British Journal of Experimental and Clinical Hypnosis*, 4, 83-91.
- Watson, C. S., & Clopton, D. M. (1969). Motivated changes of auditory sensitivity in a simple detection task. *Perception and Psychophysics*, 5, 281-287.
- Waxman, D. (1986). The development of hypnosis as a psychotherapeutic force. In P. L. N. Naish, *What is Hypnosis? Current theories and research* (pp.13-36). Milton Keynes, UK: Open University Press.
- Weitzenhoffer, A. M. (1953). *Hypnotism: An objective study in suggestibility*. New York: Wiley.
- Weitzenhoffer, A. M., & Hilgard, E. R. (1967). *Revised Stanford Scales of Hypnotic Susceptibility, Forms I and II*. Palo Alto, CA: Consulting Psychologists Press.
- Weitzenhoffer, A. M., & Hilgard, E. R. (1962). *The Stanford Scale of Hypnotic Susceptibility, Form C*. Palo Alto, CA: Consulting Psychologist Press.
- Weitzenhoffer, A. M., & Hilgard, E. R. (1959). *The Stanford Scale of Hypnotic Susceptibility, Forms A and B*. Palo Alto, CA: Consulting Psychologists Press.
- Wells, G. L., Lindsay, R. C. L., & Ferguson, T. J. (1979). Accuracy, confidence, and juror perceptions in eyewitness identification. *Journal of Applied Psychology*, 64, 440-448.
- White, R. W. (1941). A preface to the theory of hypnotism. *Journal of Abnormal and Social Psychology*, 36, 477-505.
- Wilson, T. D., & Nisbett, R. E. (1978). The accuracy of verbal reports about the effects of stimuli on evaluations and behavior. *Social Psychology*, 41, 118-131.
- Young, P. C. (1948). Antisocial uses of hypnosis. In L. M. LeCron (Ed.), *Experimental Hypnosis* (pp.376-409). New York: MacMillan.

- Zamansky, H. S. (1989). Discussion commentary on "Suggested negative visual hallucinations in hypnotic subjects..." *British Journal of Experimental and Clinical Hypnosis*, 6, 68-70.
- Zamansky, H. S., Scharf, B., & Brightbill, R. F. (1964). The effect of expectancy for hypnosis on prehypnotic performance. *Journal of Personality*, 32, 236-248.

Appendix 1

Simulating Instructions

Low Simulators

In this experiment, your task will be to behave as if you were a very good hypnotic subject. The experimenter that you will be working with is Arthur (Dan). He is aware that some people in the experiment are going to be faking hypnosis, but he has no idea which subjects they will be. Your task is to convince him that you are an excellent hypnotic subject. This is a difficult task and you may feel at some time that you have given yourself away. Don't worry about that possibility because if Arthur (Dan) realizes that you are faking he 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 Arthur (Dan), 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 in the way you think that a person who had been deeply hypnotized would answer them.

When the session with Arthur (Dan) is over, you will be required to participate in a second session with Richard. The second session is one of hypnosis and perception, where you will be required to rate the intensity of three tones. During this session, you

are to continue playing the role of a good hypnotic subject. At the completion of that session, Richard 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.

High Simulators

In this experiment, your task will be to behave as if you were an excellent hypnotic subject. The experimenter that you will be working with is Arthur (Dan). He is aware that some people in this experiment are going to be faking hypnosis, but he has no idea which subjects they will be. Your task is to convince him that you are an excellent hypnotic subject. This is a difficult task and you may feel at some time that you have given yourself away. Don't worry about the possibility because Arthur (Dan) realizes that you are faking he will stop the experiment immediately. So long as the session continues you will know that you are being successful in faking hypnosis. Your initial assessment of hypnotic susceptibility indicated that you are an excellent hypnotic subject and are able to enter into deep hypnosis. Today when you are faking, I would like you to use your own past experiences of what it was like to be deeply hypnotized, and also whatever cues you get from Arthur (Dan), 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 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 the suggestions but afterwards as well when you are interviewed about your experiences. During the interview you should answer all questions the way you think that a person who had been deeply hypnotized would answer them.

When the session with Arthur (Dan) is over, you will be required to participate in a second session which Richard. The second session is one of hypnosis and perception, where you will be required to rate the intensity of three tones. During this session, you are to continue playing the role of a good hypnotic subject. At the completion of that session, Richard 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
Informed Consent Form: Session 1

This project has been reviewed and approved by the Department of Psychology Committee on Research with Human Subjects as preserving the safeguards of subjects' privacy, welfare and civil liberties. The Chairperson of the committee may be reached through the Department of Psychology, Carleton University.

Before you agree to participate in this experiment, we would like you to be aware of the procedures involved.

In this first session, you will be presented with two hypnotic suggestions, and your performance on these suggestions will be both manually recorded, as well as videotaped. Your videotaped performance will be played back to you later to allow for the recall of any additional information about your experience during these suggestions. Your videotaped performance will be secured and kept confidential.

The procedures to be followed here have been carefully pretested in previous research and determined to be safe and agreeable to participants. However, if at any time, you should find any of the procedures objectionable and wish to withdraw from the experiment, you are free to do so, without loss of experimental credit or compensation.

I, the undersigned, have read the above and am willing to participate in the experiment described therein. I understand that I have the freedom to withdraw from the experiment at any time.

Appendix 3 Hypnotic Induction

Please close your eyes. Your ability to be hypnotized depends entirely on your willingness to cooperate. It has nothing to do with your intelligence. If you pay close attention to what I say, and follow what I tell you, you can easily fall into an 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 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 you 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. Relax completely.

Your legs feel heavy and limp, heavy and limp. Your arms are heavy, 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 trouble hearing me. You will not wake up until I tell you to. In a moment I will begin to count from one to ten, and 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...deeper and deeper, always deeper asleep. You will always hear me clearly, no matter how deeply asleep you may be...nine deep asleep, fast asleep. Nothing will disturb you. You are going to experience many things that I will tell you to experience...Ten. 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 and relaxed, thinking of nothing, nothing but what I say. Your eyes are closed, comfortably closed, you are thinking of nothing...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 into the darkness, backward into the darkness, and as you go backward into the darkness you feel more and more comfortable, more and more relaxed, listening only to my voice, thinking of absolutely nothing and concentrating only on my voice. You are comfortable and relaxed, and you are in a deep sound sleep, a deep sound sleep, fully prepared to respond to and experience what I will ask you to do. Fully prepared to respond to each of the suggestions which I will now give you.

Appendix 4
Hypnotic Suggestions and Experiential Analysis Technique:
Experiment 1

Pseudomemory Suggestion

Before the hypnosis session a short inquiry was conducted during which subjects were asked to think about and report on their activities on a night of the previous week. After the subjects have detailed an evening during which they were certain that they neither awakened nor remembered dreaming (i.e., a night for which there are no competing memories), the experimenter asked subjects the time at which they had fallen asleep that night, as well as the time at which they had awakened the next morning. After this inquiry an hypnotic induction was administered.

During hypnosis, the subjects were age regressed to the night of the previous week that they had nominated during the prehypnosis inquiry. They were again asked to describe their activities during that evening. Once they reported falling asleep, the experimenter suggested a rapid time progression until they reached the halfway point of their sleep duration for the particular night. The subjects were then told: " I want you to tell me whether you hear some loud noises, some loud noises that may sound like backfirings of a car or door slamming, some loud noises. Listen carefully and tell me if you hear them. "

If subjects did not report hearing the noises, they were prompted a second time with the following instructions: "Alright just attend carefully. Now tell me it's around [adjusted for each subject] o'clock, tell me whether you become aware of them now. " If subjects reported hearing noises, they were asked a series of questions that allowed them to elaborate on their memories (i.e., *Do they wake you up? Perhaps you look at your clock*

and see what time it is? Tell me what the noises sound like. How many noises do you hear? Are you getting out of bed? Do you think they might be important?).

Regardless of whether or not subjects reported the noises, the item was terminated with the following instructions: " Your mind works like a tape recorder and has probably recorded that information. Later on when you will be out of hypnosis again and you think about that particular night you will remember clearly everything that happened on that night. " After this instruction the age regression suggestion was cancelled, and the hypnosis session proceeded with the age regression and visual hallucination suggestions discussed below.

Age Regression Suggestion

In a moment, I am going to count from one to five...as I do, you will find that we are drifting away from the present, back through time. It will be as if you are on a magic carpet that will take you back through the past. With every number that I say, you will become younger and younger...you will become more and more young with each number that I say...when I get to the number five, you will again be five years old...okay? One...we are slowly going back to your first day here at Carleton. You remember that day...it all seems very vivid to you. It seems so vivid that it feels like it happened yesterday. Just let the index finger of your right hand lift up so that I will know that it's becoming very vivid and real to you [Pause and wait for subject to slowly lift finger]. Two..you're going back even further now...to your first year of high school...you feel yourself slowly getting younger and younger...younger and younger...two...younger and younger...more and more young...three...over halfway there...four...almost there, almost five years old again...five...you are now five years old...a little boy/girl of five years of age. When you've reached the age of five years old, just let the

index finger of your right hand lift up, so that I will know you've reached the age of five years...a little boy/girl of five years old. (1) How old are you? [response]; (2) What do your friends call you? [response]; (3) Where are you? [response]; (4) What are you doing? [response]; (5) Are you going to school yet? [response]; (6) Have you learned to write your name? [response. If, no, Can you print your name?]. Okay, I'm placing a pencil in your hand and a pad on the desk. Just open your eyes slowly and gently...just enough to see the pad, without becoming any less hypnotized; (7) Now write your name [response]; (8) Now write the date of your birthday [response]; (9) Now write: " I am participating in a psychological experiment." [response]. Now give the pencil and paper back to me and relax...relax completely...totally relax...

Cancellation and Age Progression: I am going to count backwards from five to one and when I get to one, you will find that you are again your normal age, the age that you were when you came here today...five...older and older, more and more old...four...three... two...almost there...one...back to your present age. Now relax completely...relaxed and comfortable. Once again I will hand you a pad and a pencil...please write your name and the sentence " I am participating in a psychological experiment."

Experiential Analysis Technique (EAT) Questions

- (1) Can you tell me what you experienced when I told you that you were five years old again?
- (2) Did you really feel that you were five years old?
- (3) Did you have any sense of your adult identity?

Positive Hallucination Suggestion

[Prior to the administration of this item, the subject is made aware of the toy directly in front of him/her. S/he are advised to take a close look at the toy. Once the subject's eyes are closed again, the toy is quietly moved from the desk directly in front of the subject to a stool on the subject's right, outside of his/her periphery].

Now I want you to open your eyes and look at the desk directly in front of you. As you continue to look at this desk, I want you to imagine that the stuffed toy is on the desk. You remember this toy quite well. You saw it at the beginning of the session. It was on the desk leaning against the curtain. I want you to imagine this toy on the desk in front of you. As you continue to look at the desk, your image of the toy is becoming more and more clear and more and more vivid. It is becoming as though the toy were actually on the desk in front of you, leaning against the front of the curtain. As you see the toy more and more clearly, the index finger on your right hand will rise. When you see it very clearly, the index finger on your right hand will be fully extended upward... [Suggestion is continued until subject's finger is extended]. Concentrate on the toy and study it carefully. Describe it in detail to me. [response]. What material would you say its "overalls" are made of? [response]. How would you describe its "facial expression"? [response]. You've probably noticed that the toy is leaning over to

one side. Why don't you just lean over and set it upright, so that it is no longer leaning over to one side? [response]. Tell me more about what you see? [response]. Describe the toy in as much detail as you can? [response]. Is there anything else? [response]. Okay, now tell me where the toy is? [response]. [Immediately after the subject indicates that the toy is on the desk, the experimenter points to the actual toy and says:] Okay, what is this? [response]. Can you explain? [response]. [Experimenter cancels the suggestion].

Experiential Analysis Technique (EAT) Questions

- (1) Can you tell me what you experienced when I asked you to visualize the toy moose?
- (2) Could you see the curtain through the toy?
- (3) Can you tell me why you said there were two toys?

Cancellation of Visual Hallucination: I am going to count backwards from five to one and when I get to one, you will find that your image of the toy has disappeared, and that all that remains is the single toy....five...more and more faint, more and more faint...four...the image is fading, becoming less clear and vivid...three...becoming more and more faint...two...the image is almost gone...one...the image is completely gone. Now relax completely...relaxed and comfortable. There is now only one toy here.

Wake-Up Procedure: You are going to wake up in a few minutes. You will feel refreshed, wide awake, and in a good mood. I will count from five to one, and at each count you will feel yourself becoming more and more awake. One...starting to awaken...two...more and more awake...three...still more and more awake...four...becoming more and more awake...five...wide awake! Open your eyes...wide

awake and refreshed!

Appendix 5

Wake-Up Procedure

You are going to wake up in a few minutes. You will feel refreshed, wide awake, and in a good mood. I will count from five to one, and at each count you will feel yourself becoming more and more awake. One...starting to awaken...two...more and more awake...three...still more and more awake...four...becoming more and more awake...five...wide awake! Open your eyes...wide awake and refreshed!

Appendix 6

Memory Post-Experiential Analysis Questions

Circle the number that is most appropriate

When it was suggested that I heard a noise during the night in the previous week, I felt that the noise had actually occurred. I felt this:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When it was suggested that I heard a noise during the night in the previous week, I was absorbed in the experience of hearing that noise:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When it was suggested that I heard a noise during the night in the previous week, the vividness with which I experienced that noise was:

1	2	3	4	5	6	7
Not at all vivid		Moderately vivid			Extremely vivid	

3

of/de

3

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

Appendix 7

Age Regression Post-Experiential Analysis Questions

Circle the number that is most appropriate

When I was asked to regress to age five, I felt that I actually was five years old. I felt this:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When I was asked to regress to age five, I was absorbed in the experience of being five years old:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When I was asked to regress to age five, the vividness with which I experienced that I was five years old was:

1	2	3	4	5	6	7
Not at all vivid			Moderately vivid		Extremely vivid	

Appendix 8

Visual Hallucination Post-Experiential Analysis Questions

Circle the number that is most appropriate

When it was suggested that I would see the stuffed toy, I felt that I actually saw the stuffed toy. I felt this:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When it was suggested that I would see the stuffed toy, I was absorbed in the experience of seeing the stuffed toy:

1	2	3	4	5	6	7
Not at all			Moderately		Completely	

When it was suggested that I would see the stuffed toy, I was able to imagine the stuffed toy:

1	2	3	4	5	6	7
Not at all vivid		Moderately vivid			Extremely vivid	

Appendix 9
Instructions for Category Rating Procedure

Following each trial you will be asked to call out the number that best reflects the loudness with which you heard the tone. The scale you will use to give me this number is here. Notice that 0 is marked "no sound" and means you could not hear the tone at all, 1 is marked "very faint" and means that you could just barely hear the tone; 10 is marked "moderately loud" and 20 is marked "intensely loud". You may, of course, choose any number on the scale in between these points.

Appendix 10
Informed Consent Form: Experiment 2

This project has been reviewed and approved by the Department of Psychology Committee on Research with Human Subjects as preserving the safeguards of subjects' privacy, welfare and civil liberties. The Chairperson of the committee may be reached through the Department of Psychology, Carleton University.

Before you agree to participate in this experiment, we would like you to be aware of the procedures involved. You will be presented with a sixty decibel pure tone on three separate occasions. Following each presentation, you will be asked to rate the intensity of the auditory sensation using a scale that you will be shown.

It is important to the success of the experiment that subjects endure the tone for the full thirty seconds on which it is presented. We have found in previous experiments that all subjects are able to do this. However, if at any time you should find the sensations disagreeable and wish to withdraw from the experiment, you are free to do so, at that point, without loss of experimental credit or compensation.

I, the undersigned, have read the above and am willing to participate in the experiment described therein. I understand that I have the freedom to withdraw from the experiment at any time.

Signature of Research Participant

Signature of Research Investigator

Appendix 11
Deafness Suggestion: Experiment 2

In the next phase of the experiment, I would like you to control your mind and do everything that you can to greatly reduce the loudness with which you hear the tone, when I present it to you on the next trial. All normal, healthy people have the natural ability to exercise control over their mental processes and in this way, they can greatly reduce the loudness of what they hear. Often people are unaware of their natural abilities to control sensory experiences and, as a result, they do not use these abilities. However, probably everyone has had the experience of getting so caught up in their thoughts or daydreams that they no longer hear the radio playing, for instance. In other words, without realizing it, people can actually shut off their sensory experiences. What I will ask you to do today is to control your mind so that you can bring about this control of your sensory experiences when I ask you to do so. In the next phase of the experiment, it is very important that you use your natural abilities to control sensations to the fullest and in that way you should greatly reduce the loudness of the tone that you hear.

All people have the ability to generate images and thoughts that will take their mind off intense sensations. In this next phase of the study, please use your natural abilities to the fullest in order to reduce your hearing. There are various things that people can do in this regard. For instance, some people find it helpful to imagine that their ears are so blocked and stuffed up that they can hardly hear the tone any longer. Other people, just focus their attention on thoughts or imaginings that distract them from the tone. Different things work for different people, but all normal people have the ability to gain control of their mind and in this way control their sensory experiences. What is important is that you try your best and do everything you can to reduce your hearing. Use your natural

abilities to control your mind and in this way control your incoming sensations. By doing so, you should be able to greatly reduce your hearing.

Cancellation of Deafness Suggestion

Okay. That's fine. Now stop imaging and let yourself once again hear all sounds. Phase 2 of the experiment is over. The next phase is like trial one. I'll just present present the tone and you will tell me at the end how intense the sound was.

Appendix 12
Compliance Instruction

People who are exposed to the tone more than once tend to drift back into hypnosis, and this greatly reduces the intensity of the sound that they hear. You probably drifted into hypnosis on this last trial and, for this reason, heard very little of the tone.

Appendix 13
Cognitive Activity Assessment (Rating Scale)

This question asks about thoughts or imaginings people have while the tone is on. Sometimes in this situation people think of things other than the tone. For example, some people imagine a pleasant, quiet scene; some imagine that the tone is very far away and hardly audible; other people think of events of other kinds; some people try to distract themselves from the tone and others think or imagine their ears as stuffed up. Please indicate the extent to which you became absorbed in, imagined or thought about things of this sort. I was engaged in thinking or imagining about things of this sort: (circle one only)

1	2	3	4	5	6	7	8	9
not at		slightly		moderately		to a large		all the
all						degree		time

Appendix 14
Absorption subscale of DPQ (labelled as Questionnaire A)

Please circle the appropriate answers using the key below.

1	2	3	4
Never	Seldom	Sometimes	Very often

1. Sometimes I feel and experience things as I did when I was a child.

1	2	3	4
Never	Seldom	Sometimes	Very often

2. I can be greatly moved by eloquent or poetic language.

1	2	3	4
Never	Seldom	Sometimes	Very often

3. While watching a movie, a television show, or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it.

1	2	3	4
Never	Seldom	Sometimes	Very often

4. If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it.

1	2	3	4
Never	Seldom	Sometimes	Very often

5. Sometimes I feel as if my mind could envelop the whole world.

1	2	3	4
Never	Seldom	Sometimes	Very often

6. I like to watch cloud shapes change in the sky.

1	2	3	4
Never	Seldom	Sometimes	Very often

7. If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.

1	2	3	4
Never	Seldom	Sometimes	Very often

8. I think I really know what some people mean when they talk about mystical experiences.

1	2	3	4
Never	Seldom	Sometimes	Very often

9. I sometimes "step outside" my usual self and experience an entirely different state of being.

1	2	3	4
Never	Seldom	Sometimes	Very often

10. Textures--such as wool, sand, wood--sometimes remind me of colours or music.

1	2	3	4
Never	Seldom	Sometimes	Very often

11. Sometimes I experience things as if they were doubly real.

1	2	3	4
Never	Seldom	Sometimes	Very often

12. When I listen to music, I can get so caught up in it that I don't

notice anything else.

1	2	3	4
Never	Seldom	Sometimes	Very often

13. If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.

1	2	3	4
Never	Seldom	Sometimes	Very often

14. I can often somehow sense the presence of another person before I actually see or hear her/him.

1	2	3	4
Never	Seldom	Sometimes	Very often

15. The crackle and flame of a wood fire stimulate my imagination.

1	2	3	4
Never	Seldom	Sometimes	Very often

16. It is sometimes possible for me to be completely immersed in nature or in art and feel as if my whole state of consciousness has somehow been temporarily altered.

1	2	3	4
Never	Seldom	Sometimes	Very often

17. Different colours have distinctive and special meanings for me.

1	2	3	4
Never	Seldom	Sometimes	Very often

18. I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.

1	2	3	4
---	---	---	---

Never Seldom Sometimes Very often

19. I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.

1 2 3 4
Never Seldom Sometimes Very often

20. Things that might seem meaningless to others often make sense to me.

1 2 3 4
Never Seldom Sometimes Very often

21. While acting in a play, I think I could really feel the emotions of the character and "become" her/him for the time being, forgetting both myself and the audience.

1 2 3 4
Never Seldom Sometimes Very often

22. My thoughts often don't occur as words but as visual images.

1 2 3 4
Never Seldom Sometimes Very often

23. I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colours in soap bubbles).

1 2 3 4
Never Seldom Sometimes Very often

24. When listening to organ music or other powerful music, I sometimes feel as if I am being lifted into the air.

1 2 3 4

Never Seldom Sometimes Very often

25. Sometimes I can change noise into music by the way I listen to it.

1 2 3 4
Never Seldom Sometimes Very often

26. Some of my most vivid memories are called up by scents and smells.

1 2 3 4
Never Seldom Sometimes Very often

27. Certain pieces of music remind me of pictures or moving patterns of colour.

1 2 3 4
Never Seldom Sometimes Very often

28. I often know what someone is going to say before he or she says it.

1 2 3 4
Never Seldom Sometimes Very often

29. I often have "physical memories", for example, after I've been swimming I may still feel as if I'm in the water.

1 2 3 4
Never Seldom Sometimes Very often

30. The sound of a voice can be so fascinating to me that I can just go on listening to it.

1 2 3 4
Never Seldom Sometimes Very often

31. At times, I somehow feel the presence of someone who is not physically there.

1	2	3	4
Never	Seldom	Sometimes	Very often

32. Sometimes thoughts and images come to me without the slightest effort on my part.

1	2	3	4
Never	Seldom	Sometimes	Very often

33. I find that different odours have different colours.

1	2	3	4
Never	Seldom	Sometimes	Very often

34. I can be deeply moved by a sunset.

1	2	3	4
Never	Seldom	Sometimes	Very often

Appendix 15
Concern for Social Appropriateness Scale
(Labelled as Questionnaire B)

Instructions: Rate each question according to the extent to which it applies to you using a scale from 0 to 5, "0" being "not at all" and "5" being "extremely" (Circle one number for each).

1. I tend to show different sides of myself to different people.
0 1 2 3 4 5
2. It is my feeling that if everyone else in a group is behaving in a certain manner, this must be the appropriate way to behave.
0 1 2 3 4 5
3. I actively avoid wearing clothes that are not in style.
0 1 2 3 4 5
4. In different situations and with different people, I often act like very different persons.
0 1 2 3 4 5
5. At parties I usually try to behave in a manner that makes me fit in.
0 1 2 3 4 5
6. When I am uncertain on how to act in a social situation, I look to the behaviour of others for cues.
0 1 2 3 4 5
7. Although I know myself, I find that others do not know me.
0 1 2 3 4 5
8. I try to pay attention to the reactions of others to my behaviour in order to avoid being out of place.
0 1 2 3 4 5
9. I find that I tend to pick up on expressions from others and use

them as part of my own vocabulary.

0 1 2 3 4 5

10. Different situations can make me behave like very different people.

0 1 2 3 4 5

11. I tend to pay attention to what others are wearing.

0 1 2 3 4 5

12. The slightest look of disapproval in the eyes of a person with whom I am interacting is enough to make me change my approach.

0 1 2 3 4 5

13. Different people tend to have different impressions about the type of person I am.

0 1 2 3 4 5

14. It's important to me to fit into the group I'm with.

0 1 2 3 4 5

15. My behaviour often depends on how I feel others wish me to be.

0 1 2 3 4 5

16. I am not always the person I appear to be.

0 1 2 3 4 5

17. If I am the least bit uncertain as how to act in a social situation, I look to the behaviour of others for cues.

0 1 2 3 4 5

18. I usually keep up to clothing style changes by watching what others wear.

0 1 2 3 4 5

19. I sometimes have the feeling that people don't know who I really am.

0 1 2 3 4 5

20. When in a social situation, I tend not to follow the crowd, but instead behave in a manner that suits my particular mood at the time.

0 1 2 3 4 5

Appendix 16
Crowne-Marlowe Scale of Social Desirability
(labelled as Questionnaire C)

Directions: Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally. Circle the corresponding letter to the right of the statement.

1. Before voting, I thoroughly investigate the qualifications of all the candidates. T F
2. I never hesitate to go out of my way to help someone in trouble. T F
3. It is sometimes hard for me to go on with my work, if I am not encouraged. T F
4. I have never intensely disliked anyone. T F
5. On occasion, I have had doubts about my ability to succeed in life. T F
6. I sometimes feel resentful when I don't get my way. T F
7. I am always careful about my manner of dress. T F
8. My table manners at home are as good as when I eat out in a restaurant. T F
9. If I could get into a movie without paying and be sure I was not seen, I would probably do it. T F

10. On a few occasions, I have given up doing something because I thought too little of my ability. T F
11. I like to gossip at times. T F
12. There have been times when I felt like rebelling against people in authority even though I knew they were right. T F
13. No matter who I'm talking to, I'm always a good listener. T F
14. I can remember "playing sick" to get out of something. T F
15. There have been occasions when I took advantage of someone. T F
16. I'm always willing to admit it when I make a mistake. T F
17. I always try to practice what I preach. T F
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. T F
19. I sometimes try to get even, rather than forgive and forget. T F
20. When I don't know something, I don't at all mind admitting it. T F
21. I am always courteous, even to people who disagreeable. T F
22. At times I have really insisted on saying things my own way. T F
23. There have been occasions when I felt like smashing things. T F
24. I would never think of letting someone else be punished for my

wrong doings.

T F

25. I never resent being asked to return a favour.

T F

26. I have never been irked when people expressed ideas very different from my own.

T F

27. I never make a long trip without checking the safety of my car.

T F

28. There have been times when I was quite jealous of the good fortune of others.

T F

29. I have never felt the urge to tell someone off.

T F

30. I am sometimes irritated by people who ask favours of me.

T F

31. I have never felt that I was punished without cause.

T F

32. I sometimes think when people have a misfortune they only got what they deserved.

T F

33. I have never deliberately said something that hurt someone's feelings.

T F

Appendix 17

Vividness of Mental Imagery Scale (Labelled as Questionnaire B)

Directions: This questionnaire involves imagining certain situations. For each of the following questions, please indicate which of the responses in the key below best applies.

- (a) perfectly clear, and as vivid as the actual experience
- (b) very clear, and comparable in vividness to the actual experience
- (c) moderately clear and vivid
- (d) not clear or vivid, but recognizable
- (e) vague and dim
- (f) so vague and dim as to be hardly recognizable
- (g) no image present at all; you only know that you are thinking of it

Please circle one response for each question.

1. When you close your eyes and try to imagine a specific automobile which you have seen many times, how vividly can you imagine it?
a b c d e f g
2. When you keep your eyes open and try to imagine the automobile, how vividly can you imagine it?
a b c d e f g
3. When you close your eyes and try to imagine a color, such as a bright blue, how vividly can you imagine it?
a b c d e f g
4. When you keep your eyes open and try to imagine a patch of the wall becoming a different color, how vividly can you imagine the changed color?
a b c d e f g

5. When you close your eyes and try to imagine your name and address written on a paper before you, how vividly can you imagine seeing the words?
a b c d e f g
6. When you try to imagine hearing a tune, how vividly can you imagine it?
a b c d e f g
7. When you try to imagine yourself running, how vividly can you imagine yourself actually moving? (This refers to the feeling of your muscles in motion not to visually seeing yourself running.)
a b c d e f g
8. When you try to imagine your arms as being especially heavy, how vividly can you imagine it?
a b c d e f g
9. When you try to imagine a common odor, such as a fragrant cup of hot coffee, how vividly can you imagine it?
a b c d e f g
10. When you try to imagine a common taste, such as the sweetness of sugar, how vividly can you imagine it?
a b c d e f g
11. When you try to imagine the room as becoming especially warm, how vividly can the imagine it?
a b c d e f g
12. When you try to imagine the room as becoming especially cold, how vividly can the imagine it?
a b c d e f g
13. When you imagine yourself stroking fur, how vividly can you imagine it? (This refers to the feeling of touching, not visually trying to see it.)
a b c d e f g
14. When you try to imagine how it feels when you have a stomach ache, how vividly can you imagine it?

a b c d e f g

15. When you try to imagine the room spinning, how vividly can you
imagine it?

a b c d e f g

Appendix 18 Debriefing Procedure

This study sought to test the effectiveness of hypnosis in altering sensory experiences. Much has been written on the effectiveness of hypnosis in altering one's experiences; however, few controlled laboratory studies have been conducted to systematically test these assertions. Furthermore, we are trying to isolate what particular characteristics of hypnosis are responsible for its effectiveness. Once isolated, we can test whether these are effective in the absence of a hypnotic induction procedure.

We have found in previous studies, namely pain studies, that success with suggestions seems to generalize to other situations, in the absence of explicit instructions. We examined this hypothesis in the second session using an auditory stimulus, in an effort to test the robustness of this phenomenon; that is, we were interested in comparing your performance on trials 2 and 3. Furthermore we were interested in testing whether your performance on the memory, age regression and visual hallucination suggestions in Session 1 generalized to success with the auditory suggestion in Session 2.

Another purpose of this study was to compare the performance of excellent hypnotic subjects with a special group of subjects who were not able to enter hypnosis, despite their honest efforts to do so. These latter subjects were asked to enact the role of an excellent hypnotic subject in order to differentiate those hypnotic behaviours that are brought about by a change in the subjective experience of the subject versus those behaviours enacted without any corresponding change in experience.

Are there any questions about the study?

I would appreciate if you would not disclose the procedures of this experiment with others, particularly other 49.100 students, so

that they will have no biased preconceptions should they decide to participate in this study.

Thank-you very much for your cooperation.

Figure 1. Percentage of reals & simulators passing the pseudomemory suggestion

Figure 2. Experience ratings of pseudomemory responders versus nonresponders

Figure 3. Sound change of pseudomemory responders versus nonresponders

Figure 4. Percentage of reals and simulators showing each trance logic response

Figure 5. Trial 3 sound change of compliance
versus control subjects

Figure 6. Sound change of Ss making sentence errors versus those who did not

Figure 7. Sound change of duality responders versus nonresponders

Figure 8. Sound change of Transparency responders versus nonresponders

Figure 9. Percentage of variance in Trial 3 sound change accounted for by incompleteness and subjective experience

Figure 10. Percentage of variance in Trial 3 sound change accounted for by trance logic indices

END

28·0|5·9|2

FIN