AN EXPERIMENTAL INVESTIGATION OF A BELIEF IN HYPNOSIS AND HYPNOTIC SUGGESTIBILITY

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ABSTRACT

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by

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The experimental intent of this study was to obtain an operational definition of belief in the hypnotic phenomena and to examine the interactive effects of this belief on the success of performance of standardized scales of suggestibility under different hypnotist (E) and subject (S) combinations of belief. Hypnosis was conceptualized as an intense, interpersonal situation to which both the E and S contribute through role playing.

An interactive-belief system (IBS) was postulated to exist between the E and S contributed to by the E's and the S's belief in the occurrence of hypnotic phenomena and in their belief in their respective roles. Further, a "cultural stereotype" was postulated analogous to Sarbin's term, "position" which he regarded "as a set of expectations or acquired anticipatory reactions. That is, the person learns (a) to expect or anticipate certain actions from other persons, and (b) that others have expectations of him."

Though positive results in this study in predicted directions would have tended to support the role playing theory of hypnosis, the experiment was not designed as an attempt to support any formal theory of this phenomenon. It was hoped that the results would provide a basis for further study of the IBS in other intense, interpersonal situations such as the testing, tutorial, or therapeutic interactions.

A review of the literature demonstrated that a reciprocal, IBS could be an important aspect of "exceeding volitional limits," "pain tolerance," and "success of different induction procedures." Some theoretical structure, such as the IBS, seemed to be a necessary though not sufficient condition for hypnosis.

Design and methodology. The sample consisted of two groups: (1) a potential experimenter group selected from the male faculty of a state university and (2) a potential subject group selected from male students 21 years of age or older. A "belief-scale," constructed for the purpose and consisting of a number of statements of hypnotic phenomena, was administered to the two groups. The upper and lower quartile of scores of each group became the final representatives of the hypothetical "universe" from which the high and low-belief experimental samples were drawn. The high and low-belief groups of Es and Ss were subjected to belief reinforcement experiences slanted toward their original belief directions.

The Stanford Hypnotic Susceptibility Scale (SHSS) and the Barber Suggestibility Scale (BSS) were described and discussed as instruments to rate numerically the results of the experimental hypnotic inductions under different combinations of high and low-belief Es and Ss. A standard hypnotic induction script from the SHSS was used.

Hypotheses of differences in the means of all belief combinations on the combined and separate SHSS and BSS scores were stated in their null form with predicted directionality. It was also hypothesized that the SHSS and BSS scores would correlate significantly across all belief levels.

The final analysis utilized a standard analysis-of-variance design

for unequal cell sizes. The tests for the underlying assumptions of the statistical method used, the computer program and the levels of alpha accepted as significant were identified.

Analysis of Data. The analysis of variance for the four treatment groups on the SHSS scores, the BSS scores and the combined BSS and SHSS scores resulted in F values of 20.13, 21.25 and 24.35 respectively, rejecting the Ho of no mean differences at the .01 level of confidence. The Tukey (a) test was used to test differences between means of each treatment group for the combined and individual suggestibility scale scores. All hypothesized mean differences were supported at the .05 and/or .01 level of confidence with the exception of no significant mean differences on the combined scores and on the SHSS scores between the high E, low S belief group and the low E, low S belief group. There was a correlation of .83 between the scores on the two scales, there-by rejecting the null hypothesis of no correlation at the .01 level of confidence. None of the significant mean differences in the hypothesis occurred in predicted directions.

Conclusions. Without excessive conjecture or assumption, there were only five relatively stable conclusions based on experimental data:

1. There was a difference in hypnotic suggestibility scores between different combinations of E and S belief levels when high and low belief was measured by the upper and lower quartiles of the number of positive belief responses to the possible occurrence of hypnotic phenomena.

2. Each belief-level combination of E and S were different from every other belief level combination of E and S with the exception that the high-belief E and low-belief S group was not significantly

different from the low-belief E and S group on combined SHSS and BSS scores and on SHSS scores.

3. Belief-level combinations of Es and Ss produced significantly different responses to the suggestibility scales for each treatment group but were of no value for predicting direction. For example, it was predicted that high-belief Es paired with high-belief Ss would achieve the highest suggestibility scale scores, but this did not occur in any situation.

4. From conclusion number 2 above and from visual examination of the data, it seemed that the S's stated lack of belief was the predominate factor in high scale scores. The E's belief seemed either to have no effect or a mile reversal additive effect, i.e. the low-belief Es contributed mildly to high scale scores.

5. The two suggestibility scale scores were highly correlated, implying that they were measuring the same factors in the same directions. Thus, the belief-scale must either be measuring a factor other than belief, or strongly stated belief in hypnotic phenomena must have an inverse relation with hypnotic performance.

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CHAPTER I

THE PROBLEM

Introduction

"Let us consider this waiter in the cafe. His movement is quick and forward, a little too precise, a little too rapid. He comes toward the patrons with a step a little too quick.... All his behavior seems to us a game.... He is playing, he is amusing himself. But what is he playing? We need not watch long before we can explain it: he is playing at being a waiter in a cafe...the waiter in the cafe plays with his condition in order to realize it."

Jean-Paul Sartre, Being and Nothingness. New York: Philosophical Library, 1956, (p. 59).

Is the playing of a condition the way a human eventually fulfills or comes to believe in a condition?

Modern popular literature abounds with illustrations of the layman's concept of role playing in which the occasional insight is as repressed as it is rare. For example:

"You let them come in and look you over for a few minutes and I won't tell anyone that you've been faking."

"...You know about that?"

"Of course I do..." the doctor chuckled.... "How do you expect anyone to believe you have a liver condition if you keep squeezing the nurses' tits every time you get a chance?...."

"...Why didn't you turn me in if you knew I was faking?"

"Why the devil should I? ...we're all in this business of illusion together. I'm always willing to lend a helping hand to a fellow conspirator along the road to survival if he's willing to do the same for me."

Joseph Heller, Catch-22. New York: Dell, 1962, (pp. 187-188).

Can one measure the effect of "...this business of illusion...."? In other words, how does a subject's belief in the role he is playing affect his behavior? This study attempts to examine the effects of such beliefs through the medium of hypnotism.

In this study, the subjects' (Ss') stated beliefs about hypnotism

will be used to classify them as "high" or "low" believers. If the subject's belief in the known attributes of hypnotism is high, then he should be a "good" hypnotic subject as defined by the number and degree of tasks that he can do while under hypnosis. However, more useful information can be obtained if one also examines the belief of the hypnotist and how it influences the subject by decreasing or amplifying their shared beliefs. These shared beliefs can be called the Interactive Belief System (IBS).

A crude, but meaningful, measure of the IBS can then be made by comparing high belief (H.B.) and low belief (L.B.) as they function with H.B. and L.B. hypnotists or experimenters (E). This, then, is the basic plan of the following study. The true intent of the study is to obtain additional specific information regarding a one-to-one relationship via the medium of hypnosis. The specific results may then have general implications for other similar relationships.

Purpose

This study is an inquiry into the effect of the interactive-beliefs of the subject and experimenter in hypnosis. The interactive-belief system is the subject's and the experimenter's belief that what is happening is occurring because the experimenter is hypnotizing the subject. The phenomenon of hypnosis is conceptualized by various theorists as an intense interpersonal situation to which both the subject and the experimenter contribute through role playing (25, 34, 41), rather than one into which the uninvolved examiner forces the subject.

Though positive results in this study would tend to support the role-playing theory of hypnosis, the experiment is by no means designed as an attempt to support any formal theory of this phenomenon. "One can venture to predict that when sufficient experimental data has accumulated, any simple formula to explain hypnotic behavior will be open to serious question." (5)

The experimental intent of this study is to obtain an operational definition of belief in the hypnotic phenomenon and to examine the interactive effects of this belief on the success of hypnosis under different experimenter and subject combinations of belief.

Need

An examination of interactive-belief systems in hypnosis may have implications for other intense, interpersonal transactions which are usually thought of as situations where an uninvolved authority manipulates the interaction or the person: e.g. the testing, tutorial, or therapeutic interaction. Hypnosis is still conceptualized by the popular mind as a manipulative relationship although there is growing accumulation of contrary evidence. (4)

To what extent does the mutual belief or disbelief of the subject and examiner in a specific process such as counseling or hypnosis affect the outcome of the process? A series of experimental theories (17, 28 p. 321, 30, 33, 36, 39, and 42) show that subjects holding positive attitudes toward hypnosis tend to score higher, but not always significantly higher, on test suggestions than subjects holding negative attitudes. Barber (5) suggests that these studies are not conclusive and emphasizes the potential influence of the unexamined effects on suggestibility beliefs shared by the subject and the experimenter concerning the "power of suggestions" or the "power of hypnosis."

Many variables, such as volunteering for experiments (5, 29), age (15), and college subjects as opposed to working class subjects (21), seem to influence hypnotizability and suggestibility but, according to Hilgard,"It can be said with confidence that there is no diagnostic category that precludes hypnotic susceptibility; correspondingly there is none that guarantees it." (28, p. 295) Thus, the variables may be influenced by the interactive-beliefs of the experimenters and the subjects. The identification of these belief effects would aid in the control of future experiments in hypnosis and counseling.

This experiment may be pertinent for specific facets of counseling. Of particular interest is the counseling relationships wherein counseling success if purportedly related to the client's heightened expectations for improvement, his belief that he will improve and the counselor's belief in the phenomenon of counseling, the esteem in which he holds professions similar to his and his belief in a counseling theory (22).

Bednar (22) in reviewing certain literature believes that there is a consistent picture revealing a high-persuasibility personality which has higher expectations of the counseling situation and, according to the client's own report of decreased discomfort resulting from the counseling situation, is more apt because of the predisposition or prebelief to benefit from counseling. This high persuasibility personality coupled with a counselor of strong beliefs produces a situation where the improved client becomes more like the counselor. This suggests an interacting belief system which functions to produce the counseling effectiveness.

As stated above, Hilgard's review of the literature could find no diagnostic category that precluded or guaranteed suggestibility as applied to hypnosis. Perhaps then, the effective counseling relationship is not principally related to the high persuasibility personality characterized by feelings of personal inadequacy, low self-esteem, and self-doubt as summarized by Bednar but is more actively related to the interaction of beliefs on both the parts of the counselor and the client.

The present experiment, through the use of hypnosis as an independent factor, may be useful in providing additional information regarding this action. It would be rather depressing to conceive of counseling which purports to increase adjustment and self-actualization to be merely a

personality contest where the client with personal inadequacies, low self-esteem and self-doubt is persuaded, irregardless of counseling methods to become more like their high-belief, specific-theory oriented counselor.

Hypotheses

Positive results in this study would be experimental evidence of the influence of interactive beliefs in hypnosis. Negative results would show either that hypnosis is not dependent on interactive beliefs, or that the subject's cultural stereotype is sufficient for inducing hypnosis, or that hypnosis is not an interpersonal situation. Positive results would be indicated by the following:

1. High-belief Es and Ss working together will achieve hypnosis more completely than will low-belief Es and Ss.
2. Low-belief Es working with high-belief Ss and high-belief Es working with low-belief Ss will achieve hypnotic behavior that ranges between the extremes of the interactive-belief combinations mentioned above.
3. High-belief Es will be more successful than low-belief Es, regardless of the belief-level of the Ss.

Theory

Limitations of the Role-playing Theory

In terms of theoretical position, the present hypothesis is that part of the phenomenon of hypnosis is an interpersonal situation to which both the subject and the examiner contribute through role playing (31, 34, 40). However, it is not assumed that the interactive-belief system explains hypnosis, nor is it assumed that hypnosis does not exist as a "real phenomenon."[1] The interactive-belief system and cultural stereotype are necessary, though not sufficient, conditions for hypnosis. The interactive-belief system includes "role playing," the desire of the S to please the E, and the effect of the "cultural stereotype."

The "Cultural Stereotype"

"Cultural Stereotype" is analogous to Sarbin's term "position" which he regards "as a set of expectations or acquired anticipatory reactions. That is, the person learns (a) to expect or anticipate certain actions from other persons and (b) that others have expectations of him." (35, p. 225)

The "cultural stereotype" is the "set" both S and E have about hypnosis and its alleged powers (34) based on the mythology within the culture. (31) The mutual expectations of the S and E determine what, when and how hypnotic behavior is manifested (24).

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[1]See Friedman, Becker, and Bachman, where the first reliable physiological correlate of hypnosis is reported (29).

Subject Belief and Motivation

Subject-belief in hypnosis is vital, and hypnotic responses may be induced by simple task motivation instructions as well as the usual induction procedure (4, 9). The present study will attempt to explore the hypothesis that experimenter-belief also affects hypnosis.

CHAPTER II

REVIEW OF THE LITERATURE

The outline of this chapter follows: (a) S (subject) belief, (b) E (experimenter) belief and interaction, (c) belief and the relief of pain, (d) belief and the induction procedure, and (e) summary.

Subject Role Taking and Belief

White defines hypnosis as "...meaningful, goal-directed striving, its most general goal being to behave like a hypnotized person as this is continuously defined by the operator and understood by the subject...hypnotic behavior, on the face of it, can be adequately understood in no other way." (40, pp. 483-48)

Sarbin makes the position even more explicit by stating that "hypnosis is one form of a more general kind of social psychological behavior, namely, role taking. (34, p. 255) In the hypnotic experiment, the subject strives to take the role of the hypnotized person; the success of his striving is a function of favorable motivation, role perception, and role-taking aptitude." (34, p. 259)

Orne's discussion of the "demand characteristics" of the experimental situation (31) and the E's stake in the "correct" behavior of the S (32) are particularly relevant and will be discussed in detail.

Role-set and Responsibility

The S's belief in what is expected of him affects his behavior. Ss convinced through a "rigged" demonstration that hypnosis entailed "catalepsy of the dominant hand" all showed this catalepsy, though it never appears naturally (31). This study demonstrates that

hypnotic manifestations do not inhere within the person, but are related to how the S conceives his role and the "cultural stereotype."

Lethargy during hypnosis, long thought to be a "sign" of hypnosis, can be changed by a simple command to "be awake" or "be alert..." (10, 26) --in other words, "play your role differently."

Inter-subject differences when being hypnotized or "awakened," lethargy of execution, ability to open the eyes during hypnosis, could all be traced to preconceptions held by the Ss about hypnotic behavior (34).

Stealing, exhibitionism, throwing acid into the face of the E (presumably unhated), and picking up poisonous snakes have been performed while under hypnosis. (3) Such acts seem to cast doubt on the "role playing" and "belief" hypothesis since they are presumably performed against the S's will. However, closer examination of the situation indicates that the E is implicitly responsible for any danger or "misdoings." When the Ss were explicitly told that the E accepted no responsibility for the anti-social action of the S, there was not a single compliance among a group of fifty well-trained Ss (24).

Note that it is difficult to study "hypnosis," or more operationally, compliance with bizarre commands, because "of the very high degree of control in the experimental situation itself." (32) Orne has been "...singularly unsuccessful in finding an experimental task which would be discontinued, or, indeed, refused by Ss in an experimental setting." (32, pp. 777-778) Bizarre or extremely compliant behavior can be obtained simply because the S sees

himself as a subject participating in a psychological experiment.

Ability to Exceed Volitional Limits During Hypnosis

The almost magical ability of Ss to exceed the limits of volition has been used as evidence that hypnosis alters the individual--a position irreconcilable with a "role playing" or "belief" hypothesis. However, this ability tends to disappear when appropriate control groups are employed, testing whether the Ss would have behaved the same if appropriately motivated but without being "hypnotized."

The numerous phenomena previously reported to result from hypnotic suggestion have all been demonstrated without "hypnotic" suggestion. Some of these non-hypnotically induced phenomena are: "hypnotic color blindness" (18), endurance of pain (20), hallucination of a color and then its after-image (2), age regression (7, 8), hypnotically induced dreaming and special powers to interpret dream symbolism (13), alteration of gastric functioning (34), hypnotic deafness, cardiac acceleration, cardiac stand-still, electrocardiographic alterations, change in blood-glucose level, production of herpetic cold sores, production of localized nonherpetic blisters, and curing of warts (12).

Sarbin's (1950) work is especially relevant. He found that those Ss who could inhibit gastric activity through imagination, without hypnotic induction, could inhibit gastric activity after hypnosis; Ss who would not inhibit gastric activity through imagination could not. Hypnosis did not confer special powers previously lacking. Those with good "role-playing ability" made good Ss (34).

The E and the Interaction

It seems unlikely that the S could assume his role if the E refused to play a reciprocal one. Orne's comments on the hypnotic interrelationship were the starting point of the present hypotheses. "Many aspects of hypnosis can best be conceptualized as a folie a deux--a set of complementary expectations about an unreal definition of the situation. Thus, the S acts as though he were unable to resist the suggestions of the hypnotist and the hypnotist acts as though he were all powerful, ...not only does the S experience hallucinations...but the hypnotist also acts as though the S were in fact seeing the hallucination." (31, pp. 1100-1101)

There is no experimental evidence directly clarifying the role of the E within the hypnotic relationship. However, anecdotal and implied evidence can be gleaned from the existing literature.

For example, Orne (32) had Ss simulate hypnotic behavior to see if the experienced hypnotist could differentiate them from non-simulators. A hypnotist incorrectly thought one S to be a simulator. The hypnotist tried to hypnotize this S but failed completely and instead angered the S. The interaction between the hypnotist and the S was completely changed by the hypnotist's perception. A salient observation is that the procedure was not automatically successful with an S who had been hypnotized many times before. On the contrary, an opposite effect occurred because of the hypnotist's misperception. The interaction is important--both must believe and play their roles.

Ambrose (1) unwittingly discusses the importance of the E's expectations in hypnosis when he mentions the need for an "analysis"

for all who would be hypno-therapists, "...so often the study of hypnosis attracts the wrong type of person, more intent upon personal glory and the expression of his own morbid emotions than his patient's well-being. Because hypnosis lends itself to the attainment of the power urge, hypnotists must endeavor to recognize certain emotional difficulties in themselves. The relationship can be rewarding to the E only if he feels and acts as if the S were 'in his power'. Those psychiatrists who have used hypno-therapy with some success and have made good hypno-therapists have, following their analysis, found themselves either uninterested in the pursuit of hypnosis or incapable of hypnotizing their patients." (1, p. 28) The present experiment would propose that what has changed is that the E no longer plays or feels comfortable with the role of the omnipotent hypnotist. Without belief, hypnotism falters.

"To be a good hypnotist is not easy--it takes years of practical experience, together with personality and a faith in oneself which cannot be acquired by everybody. Many doctors are afraid of failing...and feel they will look like fools. The doctor or psychiatrist must understand that suggestions should be made positively with perfect faith in themselves and in the patient getting better." (1, pp. 29-30) Explicitly, the E must believe, if he is to be a good hypnotist.

Belief and Relief of Pain

Hypnosis has been used for relief of pain during surgery in Western medicine since 1834. Only the advent of the more reliable chemical anesthetics discovered at about the same time prevented a wider use of hypnosis (23). But even here, there is an interaction

of beliefs, for the "patient must also believe that 'hypnosis' can relieve his pain and be set to accept his physician-hypnotist's word as valid descriptions of reality." (9, p. 681)

Winkelstein used hypnosis with two hundred consecutive obstetric patients. He states that "the mental attitude of the patient in the procedure as well as in the 'accoucheur,' seemed to be as important a factor as was the hypnosuggestion itself." (9, p. 681) Thus, belief in the procedure was as important as the procedure itself. Winkelstein, however, did not investigate the influence of the belief of the "accoucheur" in the method.

Butler makes explicit that there is an interaction between the hypnotist and the patient he is trying to help. He warns that when the physician alleviates pain through hypnosis, he "gives of himself ...even an hour's time with a very sick patient can produce an appreciable tiring of the hypnologist, and as the sympathetic bond between the two grows stronger, the hypnologist may even 'feel' the symptoms he is trying to eradicate from the patient." (9, p. 381) Winkelstein's observation, coupled with Butler's warning, comprises strong evidence of an interrelationship between hypnotist and subject.

Parenthetically, it is of some interest that Winkelstein reported complete childbirth analgesia in only seven per cent of his cases in the United States while Esdaile in India used hypnosis regularly for major operations. Might not Indian "cultural set" of belief in the ability to transcent the needs of the body be responsible for Esdaile's greater success?

Belief and the Induction Procedure

The element of belief can be discerned in the success of the many different types of induction procedures since Mesmer. Barber's studies of the variables influencing response to his suggestibility scale lends support to the effect of method on belief. For college students, simple "task motivation instructions are more effective than sleep suggestions." (11) Some methods of interest follow.

Mesmer would "...bring his hand slowly down from the shoulders to the arms and hands. After holding the thumbs for a short time, he would repeat the movement two or three times. Mesmer used passes and actual handling of the patient, touching the seat of pain." (1) Boring (23) adds to the practitioner's description.

"In Paris (Mesmer) constructed his famous baquet. It seems to have been an oak chest, containing chemicals and fitted with many appendages of iron. It was supposed to have been magnetized by Mesmer and to be capable of transmitting the magnetism to the subjects.... The room which contained the baquet was dimly lighted and hung with mirrors; strains of soft music sounded...; Mesmer appeared, sometimes in magician's dress, and passed about the circle of sitters, touching one, making passes over another, and fixing a third with a glance. The effects were emotional and various; many cures resulted; and hypnosis undoubtedly played an important role in these results. Often, when he fixed a sitter with his eye and said to him, 'Dormez!' the man seemed to go at once to sleep." (23)

Note that there was no direct suggestion of alleviations of symptoms--yet there were many cures. Patients knew what was expected, or what they wanted. Orne points out that in the thousands

of Ss he has hypnotized, he had never encountered the phenomena which Mesmer did--hysterical convulsions, followed by deep sleep, with the patient waking up relieved of symptoms (31). It seems that when the stereotype is different, different behavior is obtained.

A completely different method was used by Esdaile (1808-1859) in India, in a small hospital founded specifically for his research on the anesthetic properties of Mesmerism.[1] (24)

"Esdaile's method...the patient was placed in a darkened room and was told to close his eyes and go to sleep. Passes were made over the entire body and the operator would gently breathe upon the head and eyes. This was continued for an hour or so." (1, pp. 30-31) Note the absence of verbal suggestion.

"Charles Richet's method. He pressed the thumbs for three or four minutes and made passes with contact." (1, p. 32)

"Voisin's method...is said to have used force in order to induce hypnosis in his psychotic patients. Patients were restrained in a straight jacket and forced to look at an object...one patient was hypnotized only after eight hours of continual suggestions...." (1, pp. 32-33)

However, when Bramwell started a consulting practice, he found that these same techniques did not work with his individually treated, presumably wealthier, patients. Bramwell had to "talk to (them) first, ascertain their views on hypnosis, lay emphasis on

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[1]Notice that the character of the hospital would bias the patient sample and hence his statistics; only those who believed would apply.

fixed gazing at his eyes...elaborate further, then darken the room,...and if the eyes did not close...spend more time in suggestions of a relaxing and sleepy nature." (1, pp. 32-33) The expectations of the consultation patients were different and there was no chance to see how others were reacting. Therefore, it became important to ascertain their views on hypnosis before any hypnosis could be accomplished, that is, reinforce the cultural stereotype.

The methods cited above, by no means an exhaustive list, are so varied that it must be surmised that the induction procedure per se has little to do with the results obtained. Some methods have dispensed with suggestions entirely while some use passes of the hand and others not.

What seems constant throughout the literature on hypnosis is the suggestibility of the Ss, the belief of the S and the E in the method, and a "cultural stereotype."

Summary

It has been demonstrated that a reciprocal, interactive belief-system is an important aspect of "exceeding volitional limits," "pain tolerance," and "success of different induction procedures" --a necessary though not sufficient condition for hypnosis.

The next chapter outlines a method for testing the hypothesis.

CHAPTER III

DESIGN AND METHODOLOGY

Sample

The sample consisted of male college students and faculty members. This general population was the type most frequently used in hypnosis studies (Barber) and the results were applicable to research in University settings.

Though the samples were determined to some degree by availability, it was believed that they were random samples of their theoretical populations. A second limiting factor in the sample that demanded caution in generalization and which was a possible source of external invalidity was the specific locus of the population.

Experimenter Selection

The Es (experimenters) were "hypnotically naive," male faculty members of approximately equal educational level from Northern Michigan University. "Hypnotical naivety" meant that the E reported that he (a) had never been "hypnotized" and (b) had never "hypnotized" anyone. It was assumed that witnessing hypnotism would not be a significant variable beyond the effect it had on belief.

The Es were selected on the basis of their responses to a "belief-scale." This belief-scale, specifically constructed for use in this experiment, was composed of positive statements of the effects obtainable under hypnotic conditions that had been examined in the literature and reflected the "cultural

stereotype."[1]

The belief-scale was sent to all faculty and staff members with a minimum of a "masters degree." They were asked to respond to the belief-scale according to directions and requested to answer questions regarding their experiences with hypnosis. Of the 255 belief-scales sent through campus mail, 127 were returned.

The responses were computer scored and the top and bottom quartiles were selected as being representative of "high" and "low" belief in the behavioral and physiological manifestations possible during "hypnosis." The "hypnotically naive" were further separated from the high and low belief groups on the basis of their responses to the questions about their experiences with "hypnosis." After this sample clarification, appointments were made randomly with those remaining, yielding a final sample of 15 high-belief and 15 low-belief Es.

The Es were then "manipulated" to reinforce their belief direction. Since more Ss were available than Es, the number of Es willing to devote the five hours needed for the manipulation (demonstration), training, and experimental sessions became the critical factor in limiting the number of experimental pairs of Es and Ss.

After manipulation, the final experimental sample of Es was given one to two hours of training in induction technique using a standardized script from the "Stanford Hypnotic Susceptibility

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[1]The belief-scale is contained in Appendix A.

Scale." (36, pp. 8-18)

Subject Selection

The Ss were "hypnotically naive," male volunteers with "hypnotic naivety" being the same as defined in the section on E selection. The Ss were 21 years of age or above. The same belief-scale used to select Es was used to determine initial belief.

The belief-scale was sent to a computer-selected list of all male students who were over 21 years of age at the beginning of the Fall Semester. Of 530 questionnaires sent by campus mail, 195 were returned. Two follow-up letters were required to produce the 195 returns.

The responses were scored and the sample selected as described in the section on "Experimenter Selection." The Ss received the same manipulation procedure as the Es and the high and low belief groups were randomly assigned to the Es to comprise the four belief combination groups consisting of experimental pairs.

Subject and Experimenter Manipulation

When the high and low-belief Es and Ss were selected, respectively different belief reinforcements were administered. Two demonstration Ss were hypnotized before the high belief Es and Ss and several of the effects from the belief-scale were performed. At the end of the demonstration, the coached Ss reinforced the "cultural stereotype," i.e. the behavioral control of the S by the hypnotist, involuntary compliance by the S, and the S's ability to exceed volitional limits. When the demonstration was staged for the low-belief Es, the Ss "awakened" during the demonstration and reinforced at the end of the session the idea that this could have

been stopped at any time and that he was hypnotized because of a desire to please the demonstrator. The belief-scale was again administered at the end of the demonstrations, and those Es and Ss suspecting a manipulation or showing a reversal of manipulated direction on the belief-scale retest were eliminated from experimental consideration.

A cadre of four demonstration subjects had been trained for six months prior to the demonstrations and were well acquainted with their roles and with the experimental goals. These were such responsive hypnotic subjects that their failure to remain hypnotized for reinforcing the low-belief groups had to be pre-arranged by hypnotic suggestion.

Instrumentation

This study required four separate evaluations: (1) initial selection of high and low belief Ss and Es, (2) secondary selection of high and low belief Ss and Es after manipulatory demonstrations, (3) evaluation of experimental groups after their first hypnotic induction, and (4) evaluation of experimental groups after their second hypnotic induction. The belief-scale was used for steps (1) and (2) above. The "Stanford Hypnotic Susceptibility Scale, Form A" (SHSS) and the "Barber Suggestibility Scale (BSS) were used for steps (3) and (4), respectively, to assess the effectiveness of the E and S belief interaction. The separate and combined ratings contributed by the latter two criteria were examined in the study.

The Belief Scale

The belief scale was used to select E and S from the high and low ends of the distribution of scores from a larger population. In order to insure consistency in belief types, the scale was given after the belief reinforcement demonstrations in order to screen out Ss and Es whose belief directions changed from the reinforced direction.

The belief-scale consisted of fifty statements of a positive nature describing various phenomena reportedly occurring under a condition referred to as "hypnosis." Each item was scored on a zero to four-point scale from (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, to (5) strongly agree. The total range of possible scores was from zero to two hundred.

Many of the statements were simply reworded forms of the "hypnotic" test items used in the BSS and the SHSS. This was an "arm-chair" but empirical device to link directly belief to test item performance. Each item selected had appeared in American scientific literature on hypnosis as an experimentally verified fact and had representation in popular literature; therefore, it is assumed that the items reflected the theoretical "cultural stereotype" discussed in Chapter II.

To increase the potential range of belief scores, statements reflecting very common beliefs regarding the hypnotic phenomena, e.g. anesthesia, posthypnotic suggestion, mild hallucination, etc., were included along with the more esoteric phenomena regarding wart removal, cardiac arrest, and reduced resistance to viral infections. To aid comparative study beyond this experiment, some statements were generic, reflecting a basic principle such as hallucination, while comparable statements reflected specific, concrete manifestations of the basic principle.

The belief scale in its original form was administered to forty-two college students who were asked to respond in the manner described in the directions. The students were also instructed to ask whatever questions they desired and to write comments on the questionnaire. Where there were a number of written comments, misunderstanding of the statements, or unusual responses, the students were interviewed. Twenty such interviews were conducted and the belief-scale was rewritten to minimize the misunderstanding and to clarify the language and definitions. This process was repeated with thirty students from another class. The final administration

of the scale produced few questions and it is assumed that those students responding found the statements somewhat free of multiple interpretations. Though they may not have shared the same word connotation in the statements, the students felt that they understood; and this, of itself, reflects a "cultural stereotype."

The belief-scale was valid, relative to content, as the statements reflected the "cultural stereotype" as it is presented in Western, and particularly American, popular and professional literature. The belief-scale had face validity relative to the stated purpose presented to subjects responding to the scale.

Split-half and odd-even reliability correlations were computed for the original and final forms of the belief-scale and for the total sample groups of respondents. The Pierson product-moment formula produced correlation coefficients ranging from .71 for the first form to .80 for the final form. The Spearman-Brown formula was applied to these coefficients to estimate the reliability of the full test. The Spearman-Brown formula produced estimated full-test reliability coefficients ranging from .83 for the first belief-scale form to .89 for the final form.

The Stanford Hypnotic Susceptibility Scale (SHSS) Form A

The SHSS is a scale consisting of twelve items scored objectively with a plus or a minus. Each item consists of a specialized hypnotic task and some of the items are similar to the Barber Suggestibility Scale which will be discussed at a later point in the manuscript. The SHSS presents a script to be used in establishing rapport prior to initial hypnotic induction. A second important feature is that the scales give a complete standardized

script-form induction procedure specifically fitted for subjects volunteering for a laboratory experiment. Furthermore, the script is easy to follow if the E has one or two hour's training.

Administration and Scoring. Administration of the twelve test suggestions require approximately twenty-eight minutes including fifteen minutes for eye-closure, which is a major part of the induction technique. Tests for amnesia and follow-up interrogation can consume from fifteen to twenty additional minutes. The follow-up interrogation also assures the removal of any residual effects that may be present at the end of the session.

A brief resume of the items in the order of their presentation is as follows:

1. Postural Sway: Preceding this initial item, the E has followed the script in establishing rapport; and the postural sway, even though it is a score item, is designed to give the S confidence in the E. The S is asked to stand with his back to the E with heels and toes together, and hands by his sides. After a period of delay, the S is given suggestions regarding swaying backward and the suggestions are continued for two minutes or until the S falls backward and is caught by the E.

2. Eye Closure: Eye closure includes induction method proper and consists of an object fixation technique.[1] The induction method can be examined in Appendix B and includes relaxation and

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[1]Circles cut from red reflective tape were used as fixation objects.

eventually eye closure suggestions.

3. Hand Lowering (Left Hand): Starting with the S's left arm extended and horizontal, suggestions are given that the arm is becoming heavy and is moving down. A score of plus is given if the hand has lowered at least six inches by the end of the suggestions and a ten-second wait.

4. Arm Immobilization (Right Arm): The S's right arm is relaxed on the chair and he is given suggestions that the arm is becoming heavy and immobilized. A score of plus is given if the arm rise is less than one inch in a ten-second period after the S is instructed to try to raise his arm.

5. Finger Lock: The S begins with his fingers interlocked, palms pressed together and is given suggestions that his fingers are becoming more tightly interlocked to the point where he cannot completely separate his hands and fingers. A score of plus is given if the fingers are incompletely separated at the end of a ten-second period after the subject is told to separate his hands.

6. Arm Rigidity (Left Arm): Starting with the S's left arm extended straight out and the hand making a fist, suggestions are given that the arm is becoming stiff and unbendable. A score of plus is given if there is less than two inches of arm bending in ten seconds after the S is told to try to bend his arm.

7. Moving Hands (Together): The S begins with both hands out in front, palms facing inward about a foot apart. The S is given suggestions that his hands are attracted to each other as if they were magnets. A plus score is given if the hands are not over six inches apart at the end of a ten-second waiting period.

8. Verbal Inhibition (Town): This is test 8b from the SHSS substituted for 8a since 8a is identical to test 5 on the BSS. The S is told that it is difficult if not impossible for him to say the name of his home town. A score of plus is given if the name is unspoken in ten seconds.

9. Hallucination (Fly): Suggestions are given to the S that there is an annoying fly present and that this fly is darting at his face. A score of plus is given for any grimacing, any movement, any acknowledgment of effect or a brushing of the hand to remove the hallucinatory fly.

10. Eye Catalepsy: The S begins with his eyes closed and receives suggestions that it will be impossible for him to open his eyes. A score of plus is given if the eyes remain closed at the end of a ten-second period.

11. and 12. Posthypnotic Suggestion (Changing Chairs); Amnesia: While the S is in a presumed hypnotic state, he is told that he will not be able to recall any of the preceding tasks discussed above and that he will have no wish to do so. In addition, a posthypnotic suggestion is given that when the E taps his pencil on the table the S will get up from his chair and move to another chair in the room. He is also instructed that he will forget that he was told to do this. At this point the S is awakened. The E taps a pencil on the table. The posthypnotic suggestion is scored with a plus if within ten seconds after the E taps the table the S moves to another chair in the room. The amnesia is scored a plus if three or fewer items are recalled before the E says, "Now you can remember everything." The subject can receive a maximum of twelve points or pluses.

Standardization Information on the SHSS. The initial standardization data was obtained from a sample of 124 Stanford students consisting of 64 men and 60 women. (38, pp. 51-56) The correlations between scores on the different forms and in judging retest reliability yielded a combined correlation of .83. The statement is made by Weitzenhoffer that, "This correlation is high enough to indicate that hypnotic susceptibility is being measured with some degree of precision." Item analysis of each of the twelve items indicates that while the items are not of equal value, none are unreliable, all correlate significantly with the total score, and each item is making a contribution to the total score (38, pp. 54-55).

Available data indicate relatively high correlations obtained with the sample group used in standardization when low-scoring subjects and high-scoring subjects were submitted to additional hypnotic sessions. In addition, other hypnotic methods were attempted with Ss refractory on the susceptibility scale. These experiments are sufficient to give confidence in the assumption of validity.

The Barber Suggestibility Scale (BSS)

The Barber Scale consists of a series of eight standardized test suggestions that are scored both objectively and subjectively. The scale can be administered without special instructions (direct suggestions condition) or with preliminary instructions or suggestions, e.g., with preliminary motivational instructions or with a hypnotic induction procedure (11, p. 812). The items in the scale are representative of the types of test-suggestions that have been traditionally used in experiments subsumed under the label "hypnosis."

Administration and Scoring. Administration of the eight test-suggestions required approximately seven minutes. An additional period of three to five minutes is required to complete the assignment of objective scores and to assign subjective scores. Thus, administration and scoring of the BSS takes from ten to twelve minutes.

A brief resume of the items and the objective scoring criterion, in order of their presentation, is as follows:

1. Arm Lowering: Starting with S's right arm extended and horizontal, suggestions are given for thirty seconds that the arm is becoming heavy and is moving down. Objective score criterion: One point for response of four inches or more.

2. Arm Levitation: Starting with S's left arm extended and horizontal, suggestions are given for thirty seconds that the arm is weightless and is moving up. Objective score criterion: One point for response of four inches or more.

3. Hand Lock: S is instructed to clasp his hands together tightly with fingers intertwined and place them in his lap. Suggestions are given for forty-five seconds that the hands are welded together and cannot be taken apart. Objective score criteria: One-half point for incomplete separation of hands after five seconds of effort; one point for incomplete separation after fifteen-second effort.

4. Thirst "Hallucination": Suggestions of extreme thirst are given for forty-five seconds. Objective score criteria: One-half point if S shows noticeable swallowing, moistening of lips, or marked mouth movements; additional one-half point if S states

during the postexperimental interview that he became thirsty during this test.

5. Verbal Inhibition: Suggestions are given for forty-five seconds that S's throat and jaw muscles are rigid and he cannot say his name. Objective score criteria: One-half point if S does not say his name after five seconds of effort; one point if he does not say his name after fifteen seconds of effort.

6. Body Immobility: Suggestions are given for forty-five seconds that S's body is heavy and rigid and he cannot stand up. Objective score criteria: One-half point if S is not completely standing after five-second effort; one point if he is not completely standing after a fifteen-second effort.

7. "Posthypnotic-like" Response: S is told: "When this experiment is over...I'll click like this and you'll cough automatically.... At the moment I click, you'll cough." Objective score criterion: One point if S coughs or clears his throat postexperimentally when presented with the auditory stimulus.

8. Selective Amnesia: S is told that, when the experiment is over, he will remember all the tests except the one where he was told that his arm was moving up (test-suggestion 2) and that he will remember this test only when E says, "Now you can remember." Objective score criterion: One point if S does not refer to test-suggestion 2 but recalls at least four other test-suggestions and then recalls item 2 in response to the cue words.

Subjective scores are obtained as follows: after E states that "the experiment is over," he describes each test suggestion to which S responded and asks, "Did you feel (the suggested effect)

or did you go along with the suggestion in order to follow instructions or to please me?" A subjective score of one point is assigned to each test suggestion passed "objectively" and which S reports that he "felt." The maximum subjective score and also the maximum objective score on the scale is eight points.

Reliability of the BSS. Available data indicate that relatively high test-retest correlations are obtained for college students when the BSS is administered twice (a) with the same preliminary instructions and (b) under different preliminary instructions. (11, 19, 15)

Under three different preliminary instruction conditions, split-half reliabilities were .84, .75, and .79 for objective scores; and .88, .80, and .84 for subjective scores (11, p. 814). These indications of internal consistency reliabilities indicate that the BSS is a homogeneous scale.

According to Barber (11, p. 816), sex is not a significant factor in objective scores though a factor of sex x age groups interaction, in an analysis of variance study, indicated that girls at ages 12, 14 to 15, and 18 to 22 had higher subjective scores than boys.

BSS and the Experiment. In this study the BSS was administered during the second hypnotic session after the E had performed the general induction procedure. The BSS and the SHSS scores, single and combined, comprised the principal data used in evaluating the effectiveness of different combinations of S and E belief.

Induction Method. To control variations in induction methods, a standard induction was used as outlined in Form A of the Stanford Hypnotic Susceptibility Scale (SHSS) designed by Weitzenhoffer and Hilgard. This includes a standard procedure for establishing initial rapport. The second session induction was similar to the first except for changes suggested for Form B of the same instrument.

Statistical Hypotheses and Experimental Design

Testable Hypotheses

The following are the principal testable hypotheses of the experiment as stated in their null form:

1. No difference will be found in the extent of hypnosis as measured by combined BSS and SHSS performance between high-belief Es and Ss working together and low-belief Es and Ss working together.

Symbolically: Ho: $M_{HH} = \text{or} < M_{LL}$

2. No significant difference will be found in hypnotic suggestibility scores as measured by the combined BSS and SHSS between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: $M_{HL} = \text{or} > M_{HH}$

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: $M_{HL} = \text{or} < M_{LL}$

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: $M_{LH} = \text{or} < M_{HH}$

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: $M_{LH} = \text{or} < M_{LL}$

3. No difference will be found in the extent of hypnosis as measured by SHSS performance between high-belief Es and Ss

working together and low-belief Es and Ss.

Symbolically: Ho: M_{HH} = or < M_{LL}

4. No significant difference will be found in hypnotic suggestibility scores as measured by the SHSS between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: M_{HL} = or > M_{HH}

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: M_{LH} = or < M_{LL}

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: M_{LH} = or < M_{HH}

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: M_{LH} = or < M_{LL}

5. No difference will be found in the extent of hypnosis as measured by BSS performance between high-belief Es and Ss working together and low-belief Es and Ss.

Symbolically: Ho: M_{HH} = or < M_{LL}

6. No significant difference will be found in hypnotic suggestibility scores as measured by the BSS between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: M_{HL} = or < M_{HH}

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: M_{HL} = or < M_{LL}

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

Symbolically: Ho: $M_{LH} = \text{or} < M_{HH}$

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

Symbolically: Ho: $M_{LH} = \text{or} < M_{LL}$

7. There will be no correlation between the scores assigned by the BSS and the SHSS.

Symbolically: Ho: $r = 0$

Analysis

The study will utilize a 2 x 2 factorial design with high and low belief groups for Ss and Es. The design is summarized graphically in figure 1.

	Subjects	
Experimenters	High Belief	Low Belief
High Belief	high-high	high-low
Low Belief	low-high	low-low

Figure 1 Graphic summary of the research design

A simple analysis of variance was computed on the BSS, the SHSS, and on the combined data from both of the instruments. The Tukey (a) test for determining differences between treatment means was applied to the means of the groups whenever the analysis of variance produced a significant "F" in order to determine the source of differences and if the difference was attributable to more than one sample group.

The analysis of variance assumes homogeneity; therefore, Cochran's test for homogeneity of variances was necessary (42, pp. 92-96). If the test supported the assumption of homogeneity, the variances were treated, statistically speaking, as equal. An alpha of .05 was accepted as significant in all of the statistical tests. The computer program used is a rewritten I.B.M. 1620 users group "analysis of Variance, Means and SDs for subgroups with unequal, or equal N," 6. 0. 140 in the 1620 General Program Library. (37) Since the program contained some errors and was rewritten for

the use of other researchers, it is reproduced in complete form in Appendix B.

A Pierson product-moment correlation was performed on the BSS and the SHSS scores to see if they had a linear agreement.

Summary

The source of the sample was identified and limiting factors pointed out. Initial selection of the sample included two groups: (1) a potential E group selected from the male faculty of a state university and (2) a potential S group selected from male students 21 years of age or older. A belief scale, discussed in chapter III and which rates "belief" in hypnosis in quantitative terms, was administered to the two groups and the upper and lower quartile of each group who were screened for hypnotic naivety became the final samples. These samples were then described as high and low-belief Es and high and low-belief Ss. The high and low-belief groups of Es and Ss were subjected to different belief reinforcement experiences.

The Barber Suggestibility Scale and the Stanford Hypnotic Susceptibility Scale were described and discussed as instruments used to rate numerically the results of the experimental hypnotic inductions under different combinations of high and low-belief Es and Ss.

A standard induction procedure was identified for use in the study, and statements of the hypotheses to be tested were listed in their null form.

The final analysis utilized a 2 x 2 factorial design. This is a standard statistical design and is graphically represented in figure 1 in the chapter. The underlying assumptions of the statistical method used, the computer program, and the levels of alpha accepted as significant were identified.

CHAPTER IV

ANALYSIS OF RESULTS

Précis of Results

Even though the predicted differences occurred between the different belief-level combination groups, the most interesting and prominent feature of this experiment was that none of the significant mean differences in the hypothesis occurred in predicted directions. The treatment combinations with low-belief subjects (Ss) scored consistently higher on the suggestibility scales and the high-belief experimenters (Es) were split between the highest and the lowest scoring treatment groups. A simplified summary of these results is given in Table 4.1.

Table 4.1

Graphic summary of treatment group means showing a reversal from hypothesized order of suggestibility scale scores.

Belief Combination Group		Combined BSS and SHSS Score Means	SHSS Score Means	BSS Score Means
Es' Belief	Ss' Belief			
high	low	17.00	9.47	7.54
low	low	15.37	8.91	6.46*
low	high	11.92	6.67	5.25*
high	high	7.58	4.00	3.58

* The data from the BSS scores produced the only reversal in mean order but only for the two middle groups.

Treatment Groups and the Data

There were four groups of experimental pairs composed as follows:

Group 1 - 14 pairs with a high-belief E and a high-belief S.

Group 2 - 12 pairs with a low-belief E and a high-belief S.

Group 3 - 13 pairs with a high-belief E and a low-belief S.

Group 4 - 11 pairs with a low-belief E and a low-belief S.

The E in each pair performed a standardized hypnotic induction procedure for the S in each of two sessions and administered respectively the SHSS and the BSS. The two instruments were scored by trained observers and by the E, who had received orientation and training in scoring. The scales were simple to use, and scoring was specific and concrete. There were no discrepancies between E and observer scoring, and tests at the end of observer training revealed no discrepancies in scoring between observers. The scores obtained from the SHSS and the BSS, both singly and in combination, were the data used in this study.

Statistical Method

An analysis of variance design was used to examine the data and test hypotheses 1 through 6 as listed in Chapter III. A Pierson product-moment correlation coefficient was used to examine hypothesis 7. The original analysis of variance program was selected from an I.B.M. General Program Library and was designed for the 1620 series computer (37). Due to the multiple screening of the sample groups in addition to the attrition of Es and Ss in training and experimental irregularities, the final number of sample pairs in each belief-combination group could not be controlled. This specific computer program was particularly useful since it permitted subgroups of unequal N. It was discovered that this program contained errors when it was tested with known data. The program was then rewritten and adapted for the 360 series computer. This new program is contained in Appendix B.

The data specifically relating to the hypotheses were the separate and combined raw scores from the BSS and the SHSS which were the quantitative results of the two hypnotic sessions. Each hypnotic session for each experimental pair consisted of two forty-five to sixty-minute periods interrupted by a fifteen-minute rest period.

Cochran's test for homogeneity of variance (42, pp. 94-95) was applied to each set of data, since homogeneity is a prerequisite assumption for an analysis of variance design. The Cochran test was selected after comparisons with the Hartley F max test (42, p. 94) and the Bartlett Test (42, p.95). These tests tend to reject Ho more frequently than they should. Since the Cochran test uses more of

the information in the sample data, it is generally somewhat more sensitive.

After each analysis of variance was completed on individual and combined scores of the SHSS and the BSS, the Tukey (a) method for testing differences between all pairs of means was used (42, pp. 101-104). The Tukey (a) is a very conservative test and permits the convenience of working with treatment means when dealing with unequal sample sizes.

Data Analysis

The following section will consist of a restatement of each hypothesis in the null form. Each hypothesis will be followed by applicable data. Finally, the results of the tested differences between all pairs of means will be given with a probability statement of reject or accept. Hypothesis seven will be followed by a probability statement regarding the significance of the correlation coefficient.

Hypothesis One

No difference will be found in the extent of hypnotic suggestibility as measured by the combined SHSS and BSS performance between high-belief Es and Ss working together and low-belief Es and Ss working together.

Table 4.2

Analysis of variance for combined SHSS and BSS scores with different E and S belief Combinations.

Source of Variation	df	SS	MS	F
Treatments	3.	694.	231.	24.35**
Experimental error	46.	437.	9.	
Total	49.	1131.		

** $p < .01$

Cochran's test for homogeneity of variance with unequal cell sizes was calculated on the combined SHSS and BSS scores, resulting in a value of .428 with 4 and 13 degrees of freedom. This value was less than the tabled value (42, p. 654), thereby rejecting the

Ho of heterogeneity at the .01 level of confidence.

The completed analysis of variance of this data is shown in Table 4.2. The calculated F ratio value of 24.35 was accepted as significant at the .01 level of confidence implying that there was a significant difference between the means.

The results of the Tukey (a) test for differences between all means is shown in Table 4.3. Hypothesis One was rejected in its null form at the .01 level of confidence. A statistically significant difference did exist in the combined SHSS scores and BSS scores of hypnotic suggestibility between high-belief Es and high-belief Ss working together and high-belief Es and low-belief Ss working together. An examination of the means indicated that the low-belief Ss working with high-belief Es tended to score significantly higher in hypnotic suggestibility on both scales. This finding ran counter to the predicted direction.

Hypothesis Two

No significant difference will be found in hypnotic suggestibility scores as measured by the combined SHSS and BSS scores between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

Table 4.3

Tests on differences between pairs of means from the analysis of variance of the combined SHSS and BSS scores.

Treatments		1	2	4	3
	Means	7.58	11.92	15.37	17.00
1. High-high[a]	7.58	--	4.34	7.79	9.42
2. Low-high[b]	11.92		--	3.35	5.08
4. Low-low[c]	15.37			--	1.63
3. High-low[d]	17.00				--

df for MS_{err} = 46 and r =	2	3	4
Q_{99} =	3.82	4.37	4.70
Q_{95} =			3.79
$\sqrt{MS_{err}/n}\, Q_{99} = Q_{99}$ corr.	2.79	3.19	3.43[e]
Q_{95} corr.			2.76[f]

		1	2	4	3
	1	--	**	**	**
**p < .01	2		--	*	**
*p < .05	4			--	--
	3				--

a High-belief Es and high-belief Ss working in pairs.
b Low-belief Es and high-belief Ss working in pairs.
c Low-belief Es and low-belief Ss working in pairs.
d High-belief Es and low-belief Ss working in pairs.
e Tukey (a) test value against which all mean differences are compared at the .01 level.
f Tukey (a) test value against which all mean differences are compared at the .05 level.

Analysis of variance data in Table 4.2 and tests on differences between pairs of means in Table 4.3 provided the data for testing this hypothesis. Examination of this data revealed that:

Subhypothesis A. There is significant difference at the .01 level of confidence between high-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss. The null hypothesis was rejected at the .01 level of confidence indicating that there is a significant difference between these two groups. However, the differences were not in the predicted direction with the high-belief Es working with the low-belief Ss achieving significantly higher combined scores than the high-belief Es working with the high-belief Ss.

Subhypothesis B. There was no significant difference at the .01 level on combined suggestive scale scores between high-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss. There was a tendency in the data to move in the predicted direction but not significantly so.

Subhypothesis C. There was a significant difference at the .01 level in combined suggestibility scale scores between low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss, thereby rejecting the null hypothesis of no difference between the two groups. However, the data was not in the direction predicted, indicating that low-belief Es working with high-belief Ss achieved significantly higher combined scale scores than did high-belief Es working with high-belief Ss.

Subhypothesis D. There was no significant difference between the combined suggestibility scale scores achieved by low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss. Although the data was not significant, it

tended to move in a direction opposite from the predicted direction.

Hypothesis Three

No difference will be found in the extent of hypnotic suggestibility as measured by the SHSS performance between high-belief Es and Ss working together and low-belief Es and Ss working together.

Cochran's test for homogeneity of variance with unequal cell sizes was calculated on the Stanford Hypnotic Suggestibility Scale scores resulting in a value of .523 with 4 and 13 degrees of freedom. This value was less than the tabled value (42, p. 654), thereby rejecting the Ho of heterogeneity at the .01 level of confidence.

The completed analysis of variance of this data is shown in Table 4.4. The calculated ratio value of 20.13 was accepted as significant at the .01 level of confidence implying that there was a significant difference between the means.

Table 4.4

Analysis of variance for SHSS scores with different E and S belief combinations.

Source of Variation	df	SS	MS	F
Treatments	3	245	82	20.13**
Experimental error	46	187	4	
Total	49	432		

** $p < .01$

Table 4.5

Tests on differences between pairs of means from the analysis of variance of the SHSS scores.

Belief Group Treatments		1	2	4	3
	Means	4.00	6.67	8.91	9.47
1. High-high[a]	4.00	--	2.67	4.91	5.47
2. Low-high[b]	6.67		--	2.24	2.80
4. Low-low[c]	8.91			--	.56
3. High-low[d]	9.47				--

df for MS_{err} = 46 and r =	2	3	4
Q_{99} =	3.82	4.37	4.70
Q_{95} =			3.79
$\sqrt{MS_{err}/n}\ Q_{99}$ = Q_{99} corr.	2.17	2.49	2.68[e]
Q_{95} corr.			2.16[f]

** $p < .01$

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

Note - Q_{99} corrected values are given for each r level for comparison of mean differences as specified for the Newman-Keuls method (42, pp. 101-104) but the Tukey (a) - a more conservative test - was only the last such value at the r=4 level.

a High-belief Es and high-belief Ss working in pairs.
b Low-belief Es and high-belief Ss working in pairs.
c Low-belief Es and low-belief Ss working in pairs.
d High-belief Es and low-belief Ss working in pairs.
e Tukey (a) test value against which all mean differences are compared at the .01 level.
f Tukey (a) test value against which all mean differences are compared at the .05 level.

The results of the Tukey (a) test for differences between all means is shown in Table 4.5. Hypothesis One was rejected in its null form at the .01 level of confidence. A statistically significant difference did exist in SHSS scores of hypnotic suggestibility between high-belief Es and high-belief Ss working together and low-belief Es and low-belief Ss working together. An examination of the means indicated that low-belief Ss working with low-belief Es tended to score significantly higher in "hypnotic suggestibility," a reversal of predicted direction.

Hypothesis Four

No significant difference will be found in hypnotic suggestibility scores as measured by the SHSS between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

The data contained in Tables 4.4 and 4.5 were used to test each of these subhypotheses.

Subhypothesis A. A significant difference was obtained at the .01 level on SHSS scores between high-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss. The direction of the data was counter to predicted direction indicating that high-belief Es working with low-belief Ss tended to score

significantly higher on SHSS scores than did high-belief Es working with high-belief Ss.

Subhypothesis B. High-belief Es working with low-belief Ss are not significantly different from low-belief Es working with low-belief Ss. The data regarding this particular combination failed to reject that part of Hypothesis Four.

Subhypothesis C. There was significant difference at the .05 level of confidence between the SHSS scores obtained by low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss. Therefore, the null hypothesis of no difference between these two groups is rejected. The direction of the difference was contrary to predicted direction with low-belief Es and high-belief Ss scoring significantly higher on the SHSS than did the high-belief Es and high-belief Ss.

Subhypothesis D. There was significant difference at the .05 level of confidence between scores obtained on the SHSS by the low-belief Es working with the high-belief Ss and the low-belief Es working with the low-belief Ss. The null hypothesis of no difference between these two groups is rejected. However, the direction of the difference between the means of these two groups ran counter to predicted direction indicating that the low-belief Es and low-belief Ss group performed significantly better in achieving hypnotic suggestibility on the SHSS than did the low-belief E and high-belief S group.

Hypothesis Five

No difference will be found in the extent of hypnotic suggestibility as measured by the BSS performance between high-belief Es

and Ss working together and low-belief Es and Ss working together.

Cochran's test for homogeneity of variance with unequal cell sizes was calculated on the BSS scores, resulting in a value of .428 with 4 and 13 degrees of freedom. This value was less than the tabled value (42, p. 654), thereby rejecting the null hypothesis of heterogeneity at the .01 level of confidence.

The completed analysis of variance of this data is shown in Table 4.6. The calculated F ratio value of 21.25 was accepted as significant at the .01 level of confidence, implying that there was a significant difference between means.

Table 4.6

Analysis of variance for BSS scores with different E and S belief combinations.

Source of variation	df	SS	MS	F
Treatments	3	116	39	21.25**
Experimental error	46	84	2	
Total	49	200		

** $p < .01$

The results of the Tukey (a) test for differences between all means is shown in Table 4.7. Hypothesis One was rejected in its null form at the .01 level of confidence. Statistically, a significant difference did exist in BSS scores between high-belief Es and high-belief Ss working together and low-belief Es and low-belief Ss working together. Though there was significant difference between the two groups, data direction did not confirm predicted direction. An examination of the means indicated that the

Table 4.7

Tests on differences between pairs of means from the analysis of variance of the BSS scores.

Treatments		1	2	4	3
	Means	3.58	5.25	6.46	7.54
1. High-high[a]	3.58	--	1.67	2.88	3.96
2. Low-high[b]	5.25		--	1.21	2.29
4. Low-low[c]	6.46			--	1.08
3. High-low[d]	7.54				--

df for MS_{err} = 46 and r =	2	3	4
Q_{99} =	3.82	4.27	4.70
Q_{95} =			3.79
$\sqrt{MS_{err}/n}\ Q_{99}$ = Q_{99} corr.	.61	.70	.75[e]
Q_{95} corr.			.61[f]

** p < .01

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

a High-belief Es and high-belief Ss working in pairs.
b Low-belief Es and high-belief Ss working in pairs.
c Low-belief Es and low-belief Ss working in pairs.
d High-belief Es and low-belief Ss working in pairs.
e Tukey (a) test corrected value against which all mean differences are compared at the .01 level.
f Tukey (a) test corrected value against which all mean differences are compared at the .05 level.

low-belief Ss working with the low-belief Es tended to score significantly higher on the BSS than high-belief Ss and Es working together.

Hypothesis Six

No significant difference will be found in hypnotic suggestibility scores as measured by the BSS between:

A. High-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss.

B. High-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss.

C. Low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss.

D. Low-belief Es working with high-belief Ss and low-belief Es working with low-belief Ss.

The data contained to Tables 4.6 and 4.7 were used to test each of these subhypotheses.

Subhypothesis A. A significant difference was obtained at the .01 level on BSS scores between high-belief Es working with low-belief Ss and high-belief Es working with high-belief Ss. The direction of the data was counter to predicted direction indicating that high-belief Es working with low-belief Ss tended to score significantly higher on BSS scores than did high-belief Es working with high-belief Ss.

Subhypothesis B. There was significant difference at the .01 level on the BSS scores between high-belief Es working with low-belief Ss and low-belief Es working with low-belief Ss. The data was in the predicted direction with the high-belief E and

low-belief S group scoring significantly higher than the low-belief E and low-belief S group.

Subhypothesis C. There was significant difference at the .01 level of confidence between the BSS scores obtained by low-belief Es working with high-belief Ss and high-belief Es working with high-belief Ss. Therefore, the null hypothesis of no difference between these two groups is rejected. The direction of the difference was contrary to predicted direction with low-belief Es and high-belief Ss scoring significantly higher on the BSS than the high-belief Es and high-belief Ss.

Subhypothesis D. There was significant difference at the .01 level of confidence between scores obtained on the BSS by the low-belief Es working with the high-belief Ss and the low-belief Es working with the low-belief Ss. The null hypothesis of no difference between these two groups is rejected. However, the direction of the difference between the means of these two groups ran counter to predicted direction indicating that the low-belief Es and low-belief Ss group performed significantly better in achieving hypnotic suggestibility on the BSS than did the low-belief E and high-belief S group.

Hypothesis Seven

There will be no correlation between the scores assigned by the BSS and the SHSS.

A Pierson Product-moment correlation coefficient of .8275 (rounded .83) rejected the null hypothesis of r=0 at the .01 level of confidence for a two-tailed test of the correlation

coefficient.[1]

[1]Table of values for a one-tailed test were given in Table VI on page 362 of A. L. Edwards, Experimental Design in Psychological Research, Holt, Rhinehart and Winston, New York, 1965. The value for the two-tailed test conversion was superimposed on this table.

Summary

The null hypothesis of heterogeneity of variance was rejected for the single and combined results of the SHSS and the BSS through the use of Cochran's test for homogeneity of variance. An analysis of variance was computed for the four treatment groups on each suggestibility scale and combined scales resulting in F values significant at the .01 level of confidence.

The Tukey (a) test was applied for each analysis of variance to determine significant differences between all pairs of means.

The analysis of variance test was significant at the .01 level of confidence for the single and combined scores of the SHSS and the BSS, rejecting the null hypothesis of no difference between the means of homogeneous treatment groups. The analysis of variance and tests for homogeneity are summarized in Table 4.8.

The Tukey (a) test was used to conduct a further examination of the differences between treatment group means in testing hypotheses One through Six. All hypotheses with the exception of 2B and 4B supported the hypothesis that the treatment groups were significantly different in hypnotic suggestibility scale performance. With the exception of Hypothesis 6B, none of the significant mean differences were supported as being in the hypothesized direction of difference when a direction was specified. The Tukey (a) test data and summation of hypothesis testing is presented in Table 4.9.

There was a positive significant Pierson product-moment correlation of .83 between the scores of all treatment groups on the BSS and the SHSS. This suggested that treatment-group differences were not accidental attributes of scale differences.

Table 4.8

Summary of tests for homogeneity and analysis of variance for the single and combined SHSS and BSS scores.

Suggestibility Scale	Homogeneity of Variance Value[a]	df for homogeneity test[b]	F	F.05	F.01	df for F
Combined SHSS and BSS Scores	.523**	3 and 13	24.35**	2.81	4.24	2, 9
SHSS Scores	.511**	3 and 13	20.13**	2.81	4.24	2, 9
BSS Scores	.428**	3 and 13	21.25**	2.81	4.24	2, 9

a Cochran's test (42, pp. 94-95).
b When the number of observations in each treatment class is not constant, the N of the largest sample group is substituted for the n in the formula of K-1, n-1 = df.

** $p < .01$

Table 4.9

Summary of hypotheses testing based on the Tukey (a) test for determining significance of mean differences.

Scale	Hypothesis	Quantitative Statement of means (Ho)	Mean difference	Tukey (a) .05	Tukey (a) .01	Ho rejection	Predicted direction
Combined SHSS and BSS	1	7.58_{HH} = or < 15.37_{LL}	7.29	2.76	3.43	**	No
	2a	17.00_{HL} = or > 7.58_{HH}	9.42			**	No
	2b	17.00_{HL} = or < 15.37_{LL}	1.63				Yes
	2c	11.92_{LH} = or > 7.58_{HH}	4.34			**	No
	2d	11.92_{LH} = or < 15.37_{LL}	3.35			*	No
SHSS	3	4.00_{HH} = or < 8.91_{LL}	4.91	2.16	2.68	**	No
	4a	9.47_{HL} = or > 4.00_{HH}	5.47			**	No
	4b	9.47_{HL} = or < 8.91_{LL}	.56				Yes
	4c	6.67_{LH} = or > 4.00_{HH}	2.67			*	No
	4d	6.67_{LH} = or < 8.91_{LL}	2.24			*	No
BSS	5	3.58_{HH} = or < 6.46_{LL}	2.88	.61	.75	**	No
	6a	7.54_{HL} = or > 3.58_{HH}	3.96			**	No
	6b	7.54_{HL} = or < 6.46_{LL}	1.08			**	Yes
	6c	5.25_{LH} = or > 3.58_{HH}	1.67			**	No
	6d	5.25_{LH} = or < 6.46_{LL}	1.21			**	No

Note - Subscripts HH, LL, LH, HL denote treatment group means, e.g. HH = high-belief E paired with a high-belief S to form an experimental pair equaling one of 50 such pairs. Each pair constitutes one N in the samples.

* $p < .05$

** $p < .01$

CHAPTER V

SUMMARY

The experimental intent of this study was to obtain an operational definition of belief in the hypnotic phenomena and to examine the interactive effects of this belief on the success of performance of standardized scales of suggestibility under different hypnotist (E) and subject (S) combinations of belief. Hypnosis was conceptualized as an intense, interpersonal situation to which both the E and S contribute through role playing (25, 34, 41).

An interactive-belief system (IBS) was postulated to exist between the E and S contributed to by the E's and the S's belief in the occurrence of hypnotic phenomena and in their belief in their respective roles. Further, a "cultural stereotype" was postulated analogous to Sarbin's term, "position" which he regarded "as a set of expectations or acquired anticipatory reactions. That is, the person learns (a) to expect or anticipate certain actions from other persons, and (b) that others have expectations of him." (35, p. 225)

Though positive results in this study in predicted directions would have tended to support the role playing theory of hypnosis, the experiment was not designed as an attempt to support any formal theory of this phenomenon. It was hoped that the results would provide a basis for further study of the IBS in other intense, interpersonal situations such as the testing, tutorial, or therapeutic interactions.

A review of the literature demonstrated that a reciprocal, IBS could be an important aspect of "exceeding volitional limits,"

"pain tolerance," and "success of different induction procedures." Some theoretical structure, such as the IBS, seemed to be a necessary though not sufficient condition for hypnosis.

Design and methodology. The sample consisted of two groups: (1) a potential experimenter group selected from the male faculty of a state university and (2) a potential subject group selected from male students 21 years of age or older. A "belief-scale," constructed for the purpose and consisting of a number of statements of hypnotic phenomena, was administered to the two groups. The upper and lower quartile of scores of each group became the final representatives of the hypothetical "universe" from which the high and low-belief experimental samples were drawn. The high and low-belief groups of Es and Ss were subjected to belief reinforcement experiences slanted toward their original belief directions.

The Stanford Hypnotic Susceptibility Scale (SHSS) and the Barber Suggestibility Scale (BSS) were described and discussed as instruments to rate numerically the results of the experimental hypnotic inductions under different combinations of high and low-belief Es and Ss. A standard hypnotic induction script from the SHSS was used (38, pp. 8-17 and 30-39).

Hypotheses of differences in the means of all belief combinations on the combined and separate SHSS and BSS scores were stated in their null form with predicted directionality. It was also hypothesized that the SHSS and the BSS scores would correlate significantly across all belief levels.

The final analysis utilized a standard analysis-of-variance

design for unequal cell sizes. The tests for the underlying assumptions of the statistical method used, the computer program and the levels of alpha accepted as significant were identified.

Analysis of Data. The analysis of variance for the four treatment groups on the SHSS scores, the BSS scores and the combined BSS and SHSS scores resulted in F values of 20.13, 21.25 and 24.35 respectively, rejecting the Ho of no mean differences at the .01 level of confidence. The Tukey (a) test was used to test differences between means of each treatment group for the combined and individual suggestibility scale scores. All hypothesized mean differences were supported at the .05 and/or .01 level of confidence with the exception of no significant mean differences on the combined scores and the SHSS scores between the high E, low S belief group and the low E, low S belief group. There was a correlation of .83 between the scores on the two scales, there-by rejecting the null hypothesis of no correlation at the .01 level of confidence. None of the significant mean differences in the hypotheses occurred in predicted directions.

Conclusions

Finding differences between means was an easy task, but the prediction of direction of the differences proved to be unreliable. Since the prediction of directions was an integral part of the hypotheses, conclusions of a definite nature were difficult to derive. The belief-scale seemed to have measured with reliability some factor other than a true belief in hypnotic phenomena. If stated belief has an effect on performance, the belief scale either did not measure or did not adequately measure belief. If stated belief is correlated with performance in some negative fashion, the belief-scale may have been reflecting this relationship.

The selection of Es and Ss from the first and fourth quartile of belief-scale scores, produced distinctively different performers on suggestibility scale scores. It is possible that such a selected sample would produce distinctively different scores if some other scale had been used in sample selection. The possibilities of conjecture are increased if one assumes that belief was measured. Then expressed high-belief might have been a function of rigidity, a "set," or a pre-conception preventing attitudes that would permit hypnosis while low-belief might have represented an openness to the hypnotic experience.

Without excessive conjecture or assumption, there were only five relatively stable conclusions based on experimental data:

1. There was a difference in hypnotic suggestibility scores between different combinations of E and S belief levels when high and low belief was measured by the upper and lower quartiles of the number of positive belief responses to the possible occurrence of hypnotic phenomena.

2. Each belief-level combination of E and S were different from every other belief level combination of E and S with the exception that the high-belief E and low-belief S group was not significantly different from the low-belief E and S group on combined SHSS and BSS scores and on SHSS scores.

3. Belief-level combinations of Es and Ss produced significantly different responses to the suggestibility scales for each treatment group but were of no value for predicting direction. For example, it was predicted that high-belief Es paired with high-belief Ss would achieve the highest suggestibility scale scores, but this did not occur in any situation.

4. From conclusion number 2 above and from visual examination of the data, it seemed that the S's stated lack of belief was the predominate factor in high scale scores. The E's belief seemed either to have no effect or a mild reversal additive effect, i.e. the low-belief Es contributed mildly to high scale scores.

5. The two suggestibility scale scores were highly correlated, implying that they were measuring the same factors in the same directions. Thus, the belief-scale must either be measuring a factor other than belief, or strongly stated belief in hypnotic phenomena must have an inverse relation with hypnotic or suggestibility performance.

Discussion

This study failed to predict accurately the direction in which a pre-stated belief in hypnotic phenomena would affect performance on some of the same phenomena. The belief-scale constructed to access belief was reliable according to some measures and was valid in content. Respondents to the scale were aware that they were being asked whether or not they believed or did not believe in the occurrence of various hypnotic phenomena.

The final sample was selected from the first and fourth quartiles, further clarifying the sample into two groups whose scores reflected a number of strong, positively stated beliefs. The high-belief group of Ss also expressed a belief that they could be hypnotized while the low-belief Ss felt that they could not be hypnotized. The same situation existed for the high and low-belief Es except that they were screened according to whether or not they felt that they could hypnotize someone.

The analysis of variances indicated that significant differences existed between the treatment groups and further examination supported significantly the hypothesized mean differences between the belief-level combination groups of Es and Ss. Given these conditions, there are a number of possible sources of the discrepancy between predicted and actual experimental direction. A few of these error sources are discussed.

Sample

The sample is one possible source of the discrepancy from hypothesized directionality between belief and suggestibility scale performance. The sample consisted of the two extremes on the

belief-scale.

The two extremes were obviously different because their performance on belief-scales were different; although in the combined groups of different levels of belief, the difference may have been attributable more to one of the halves of each experimental pair than to the other. The two extreme groups may be generically extreme, that is, they may have been extreme on any belief-scale whether the belief-scale would directly refer to hypnosis values or some other phenomena. In that case, the experiment was dealing with suggestibility scale performance simply between treatment groups composed of different combinations of extremist believers.

There was no hard data to support the observation that the subjects came from different general groups, but it was observed that almost all of the low-belief Es selected came from the "hard science" area of academics such as mathematics, physical sciences, and biological sciences, while a very large majority of the high-belief Es were humanities instructors and members of the English and literature departments. It is possible, then, that the sample Es reflected some type of attitude. Since there was no convenient classification for the Ss it is not known if these fell into similar categories; but this is possible. As will be shown in later discussion, it appeared that much of the differences between means could be attributed to subject variation between the treatment groups rather than to the Es.

Belief-Scale

The belief-scale reflected strong positive stated beliefs in hypnotic phenomena. When the first and fourth quartiles of the belief scale scores were selected for the samples, the selection eliminated most of the intermediate belief levels where the respondents stated that they were undecided or "uncertain" about the various hypnotic phenomena. Furthermore, many of the items in which the sample group expressed belief or disbelief were used in the experimental situation where the sample group were asked to perform or engage in the phenomena.

Given some reliability and given the fact of the differences between treatment groups, it would seem that the belief-scale did distinguish groups that performed differently from the suggestibility scale. The final question would be, "What is the belief-scale classifying?" There is some evidence that the subjects retained their belief and that this belief affected how they thought they performed on the suggestibility scale. This fact will be discussed under the section titled The Interactive Belief System. Another possibility was that the belief-scale tested a form of rigidity in hypnotic response, a set or a predisposition to close-mindedness. In all cases high-belief Ss tended to achieve suggestibility scale scores significantly lower than those of the low-belief Ss. This suggested that the high-belief Ss may have had preconceptions regarding the hypnotic experience that were incompatible with the actual experience given them, and these interfered with their performance.

Role Playing and Cultural Stereotype

Because of its construction, the belief-scale was intended to reflect a "cultural stereotype" as discussed in Chapter II and Chapter III. It was possible that the belief-scale did not reflect this concept. There is strong support in the literature, as discussed in Chapter II, of belief in the induction procedure being necessary to achieve hypnosis and hypnotic performance. The method used in the experiment followed that outlined in the Stanford Hypnotic Susceptibility Scale and used "object fixation" which is an induction procedure well known to the professional and to the layman. The only procedures equally well known would be those of the comic book variety of "staring at the swinging disc" or the "Mandrake eye-fixation and hand-waving" technique. Therefore, it was assumed that the cultural stereotype was reflected through the induction procedure, particularly for the more educated sample.

Does a stereotype belief reflect in role-playing? Role-playing may be an ability unaffected by beliefs, or it may be more efficient in the absence of strong affirmative beliefs. This possibility led to speculation that role-playing may not be a valid concept but a form of superficial explanation of a learning process in which ability to learn is more important than stated beliefs. Again, the expression of disbelief or the understated belief may not have incurred the same resistance to hypnotic induction and suggestibility scale performance as did a strongly stated, positive belief.

The Interactive Belief System

It was hypothesized that an interactive belief system existed between hypnotist and subject that, through its combined operation of the two participants, produced hypnotic induction and suggestibility scale performance. It was also predicted that this interaction would produce the highest scores when both the hypnotist and the subject had strong, positive beliefs in what they were doing. The experiment as conducted did not support this predicted directionality and left a serious doubt concerning the existence of an interactive belief system.

A visual examination of the analysis of variances on the combined and individual suggestibility scales and an examination of the significant mean differences suggested that much of the score differences could have been attributed to the subjects rather than to the hypnotists, with the low-belief subjects achieving significantly higher suggestibility scale scores than the high-belief Ss. The data is insufficient to state positive trends, but there was some evidence that the low-belief S groups performed significantly higher than the high-belief Ss regardless of whether the low-belief Ss were paired with high or with low-belief Es. Furthermore, it seemed that the low-belief Ss were not significantly different from each other in production regardless of whether they were paired with high or low-belief Es.

If the E's belief level affected the S's suggestibility scale scores, it was probably a very mild effect and in a reverse direction, i.e. the high-belief hypnotist working with high-belief Ss tended to produce a lower score than a low-belief E working with a

high-belief S. The difference between the latter two groups was consistent on the individual scale scores and the combined scale scores.

Additional data was obtained from the BSS subjective scoring and the SHSS recall scores. The BSS subjective scores were obtained from all subjects by asking them if they felt the suggested effect of each item that they passed with some minimum score or if the subject performed the suggested action to only follow instructions and please the hypnotist. In effect, the S was asked how much he "believed" in the effect of each hypnotic task experience to which he responded. The results of the BSS subjective scores was subjected to analysis of variance and tests on differences between pairs of means. The results of this analysis is contained in Tables 5.1 and 5.2.

Table 5.1

Analysis of variance for BSS subjective scores with different E and S belief combinations.

Source of variation	df	SS	MS	F
Treatments	3	155	52	9.77**
Experimental error	46	244	5	
Total	49	399		

** $p < .01$

There was significant difference at the .01 level of confidence between the variations. An examination of the means suggested that we were dealing principally with two groups controlled by subject

Table 5.2

Tests and differences between pairs of means from the analysis of variance of the BSS subjective scores.

Treatments		2	1	4	3
	Means	2.67	3.36	5.19	6.93
2. Low-low[a]	2.67	--	.69	2.52	4.26
1. High-low[b]	3.36		--	1.83	3.57
4. Low-high[c]	5.19			--	1.74
3. High-high[d]	6.93				--

df for MS_{err} = 46 and r =	2	3	4
Q_{99} =	3.82	4.37	4.70
Q_{95} =			3.79
$\sqrt{MS_{err}/n}\ Q_{99}$ = Q_{99} corr.			3.01[e]
Q_{95} corr.			2.43[f]

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

**p < .01
*p < .05

a Low-belief Es and low-belief Ss working in pairs.
b High-belief Es and low-belief Ss working in pairs.
c Low-belief Es and high-belief Ss working in pairs.
d High-belief Es and high-belief Ss working in pairs.
e Tukey (a) test value against which all mean differences are compared at the .01 level.
f Tukey (a) test value against which all mean differences are compared at the .05 level.

belief. It would seem that high-belief subjects, according to their own report, "felt" or believed more of the hypnotic experience than did the low-belief Ss regardless of the belief level of the hypnotist with which they were paired. This suggests that a factor of belief was operating but that it was not an interactive belief system and that it operated regardless of actual experience and suggestibility scale performance. Could the belief-scale have been measuring an element of self-delusion?

Another factor incidental to the main line of the study but interesting to contemplate were the SHSS recall scores. The recall scores were, in effect, how many of the items of the hypnotic experience the subjects were able to recall; in other words, the amount of posthypnotic "amnesia" experienced by the S even after he was told that he "...could recall everything...." Analysis of variance data significant at the .01 level was obtained on this information and is presented in Table 5.3.

Table 5.3

Analysis of variance for SHSS recall scores with different E and S belief combinations.

Source of variation	df	SS	MS	F
Treatments	3	52	17	5.50**
Experimental error	46	146	3	
Total	49	198		

** $p < .01$

Table 5.4

Tests on difference between pairs of means from the analysis of variance of the SHSS Recall scores.

Treatments		4	3	2	1
	Means	3.37	3.54	5.42	5.58
4. Low-low[a]	3.37	--	.17	2.05	2.21
3. High-low[b]	3.54		--	1.88	2.04
2. Low-high[c]	5.42			--	.16
1. High-high[d]	5.58				--

df for MS_{err} = 46 and r =	2	3	4
Q_{99} =	3.82	4.37	4.70
Q_{95} =			1.86
$\sqrt{MS_{err}/n}\, Q_{99}$ = Q_{99} corr.	1.87	2.32	2.30[e]
Q_{95} corr.			1.86[f]

*p < .05

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

a Low-belief Es and low-belief Ss working in pairs.
b High-belief Es and low-belief Ss working in pairs.
c Low-belief Es and high-belief Ss working in pairs.
d High-belief Es and high-belief Ss working in pairs.
e Tukey (a) test value against which all mean differences are compared at the .01 level.
f Tukey (a) test value against which all mean differences are compared at the .05 level.

Table 5.4 contains the results of tests on differences between pairs of means from the recall scores. The differences between means were significant at the .05 level which was lower than had been previously encountered in most instances but indicating again that the S's belief was the dominating factor since the low-belief Ss were not significantly different from each other regardless of the belief level of the E. The same condition applied to the high-belief Ss. In this data, the low-belief Ss had significantly less recall, or more posthypnotic amnesia, than did the high-belief Ss. This tends to support the directionality of the data obtained from the suggestibility scale scores and supports the lack of the effect of the E's belief on the S.

In summary significant data and visually observed trends mitigated against the hypothesized interactive belief system. There is a possibility that some belief system operated to produce the data but that the difference is more apt to be attributed to S responses than the E's belief responses. If there is an interactive belief system, visual observation of the data suggests that it is operating in a reverse direction and that it operates only for those Ss designated as high-believers.

Implications for Future Research

One of the most important factors required to test the hypotheses in this study was accurately ascertaining the belief of both the Es and the Ss in the occurrance of the hypnotic phenomenon. Because of the results, there is a serious question regarding the validity of the belief-scale used to select the sample.

It is possible but not proven that the belief-scale as it exists or, for that matter, any assessment of stated beliefs in the hypnotic phenomena would produce the same reversal effect. This would imply that there is a positive but inverted relationship between statements of belief and performance, perhaps at a subconscious or preconscious level. A finding of this nature would be valuable and very similar to some of the first experiments in in-depth consumer research in which inverted relationships occurred between what a person stated that he desired in a prestige product, such as a car, and in what he actually wanted. It would be quite interesting for a researcher to ask what an individual hypnotist or subject thought that other individuals believed regarding hypnosis. This would be a slightly different way of focusing on the individual's cultural stereotype.

If there is an interactive belief system as postulated, it must be refined to test the effect of the hypnotist's belief. There is little doubt that some of the things that a hypnotist does or does not do affects the subject. For example, during the experiment, a venerable and respected high-belief professor working with a high-belief subject achieved a very high score during the first hypnotic session. During the second session the postural sway test was

repeated. The postural sway test is designed to give the subject confidence in the hypnotist who tells the subject not to be afraid since the hypnotist will "catch him" when he falls. During this test the 240 pound subject swayed as he was instructed and then fell onto the 140 pound, 65 year old professor. Though the session was continued, there was not a single score on the hypnotic suggestibility scale. Could this mean that confidence is an extremely critical factor? Could it simply mean that both were too preoccupied with their embarrassment to perform any complex task effectively? If the former is true, confidence is important. Confidence is an emotion belonging to the subject but could be affected by the manner in which the hypnotist is perceived. Because this experiment was tightly controlled, there was little obvious differences in the Es' approach, thus limiting the number of possible differential perceptions.

Because of the selection of the experimental sample from the first and fourth quartiles of the belief-scale scores, some unique attributes on the parts of the hypnotists and the subjects may have been selected. If the study is repeated, the second and third quartiles should be included and used as a control group. If this middle group did not show similar trends of a lesser degree than did the extreme treatment groups, then it could be assumed that by the very nature of the sample selection, different groups are being examined.

If the study were repeated would the belief-scale turn out consistently reversed subjects? This could be tested by using the belief-scale, selecting the sample, and then giving the Barber Suggestibility Scale with simple task-motivation instructions

rather than employing a hypnotic induction procedure. If the results were still reversed, then the induction method has no effect and the experimental belief-scale would be an inversely correlated measure of stated belief versus hypnotic task performance. The scores on the BSS would be substituted for the combined BSS and SHSS scores in the present study since the BSS is shorter and has a very good correlation with the SHSS scores.

A number of treatment groups could be selected by using the belief-scale plus other measures of beliefs, attitudes, or values and treated in the same manner though there is a paucity of research showing consistent correlations between personality traits and hypnotizability. The results would give some insight into what the belief-scale is measuring, its correlation with other measures, and the personal attributes reflecting in hypnotic performance.

Why do stated beliefs continue even after experience was counter to previously stated beliefs? The BSS subjective scores presented under the discussion section of Chapter V suggested that stated beliefs on the belief-scale paralleled self-reported experience on the BSS. If stated beliefs are strongly resistant to change when contradicted by experience, then the first and fourth quartiles of respondents to the belief-scale are actually expressing a form of self-delusion and a persistence of the self-delusional system. Would the belief responses change if this discrepancy were pointed out to the subjects? If so, this would lend mild support to superficial, rational belief therapy.

This study was originally intended to obtain research data that could be generalized, after additional research, for intense

interactive situations beyond hypnosis, such as the tutorral or therapeutic relationship in which an interactive belief system might exist. Lacking support in this study for an effective interactive belief system, such a generalization cannot be made. However, additional research is needed regarding the possibility of such a belief system in situations where two people come together in a role-oriented situation. If the inverse relationship between stated belief and actual performance in the situation held constant, then those individuals with strongly stated beliefs would have difficulty operating in a situation where these beliefs are being tested by performance. It might be as Heller says in Catch 22 that "...we're all in this business of illusion together." The self-deluding nature of strongly held beliefs has been too often chronicled not to be considered as a better predicter of behavior than what one believes one believes in.

Implications for Counseling

A few interesting speculations are evident if the results of the preceding experiment can be applied to the counseling relationship. Given the reverse results of predicted performance related to belief combinations in this experiment, an effective counselor-client relationship would not result simply from shared beliefs. As discussed earlier but not applied to counseling, the subjects or client's low belief in counseling may be more important in producing initial results than the E's or counselor's belief. For example, if the results of this experiment hold for counseling, a client who appears for his first counseling session with a low belief in the counseling process would have more success in the first counseling session than would the high-belief client.

Depending on the interpretation of the experimental results, the possibility exists that those with very high and those with very low beliefs in an interpersonal process such as counseling tend to measure two extremes of preconception or rigidity with the high believers being immediately less susceptible to changes in their preconceptions.

A recent article by Bednar (23, p. 650) suggests that the high persuasibility personality is portrayed in terms of a feeling of personal inadequacy, low self-esteem and self-doubt. Conversely, the low persuasibility subject is characterized by self-enhancement and personal assertion. Perhaps the low persuasibility counseling client is equivalent to the present study's low-belief S who performed well regardless of his beliefs when the tasks were simple and concrete, with standardized induction and procedures. Thus, if there is a

correlation between persuasibility and belief, it could be assumed that the low-persuasibility and low-belief subject would be more apt to make the best of the initial counseling contact, as well as the initial hypnotic contact. However, this promising situation may not exist if the hypnotist or counselor consciously or unconsciously attempts to persuade the low-belief client or S toward a belief not already held. In this study, the S was not asked to change his beliefs but merely to use his own resources in following a recipe (the induction procedure) for achieving certain tasks. In the case of high persuasibility clients or high-belief Ss, the counselor or hypnotist may need to give security by being persuasive. In essense, the high-belief S or client may be disappointed if there is not a ritual of mysticism to reinforce his beliefs. In the absence of the ritual, the high-believer is not rewarded and the placebo or "bedside-manner," which is partially responsible for therapeutic results (22), is neutralized.

If one is to consider more than a single contact in hypnosis or in counseling, then it would seem that the interaction of beliefs between the individuals involved and the outcome of this interaction would be worthy of further study.

And finally, is it the high-belief S and the high persuasibility client that are the disadvantaged since they cannot really believe and need a helping hand in "...this business of illusion...(to become) ...a fellow conspirator along the road to survival....?"[1]

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[1]Heller, Catch 22. New York: Doll, 1962 (pp. 187-188).

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APPENDICES

APPENDIX A

HYPNOSIS OPINION INVENTORY

This inventory consists of 50 statements designed to sample opinions about the validity of occurrences in a phenomenon labeled "hypnosis." There is considerable research and opinion disagreement as to what can actually take place with this phenomenon; therefore, there are no correct or incorrect answers. What is wanted is your own individual feeling about the validity of the statements. Read each statement and decide how YOU feel about it. Critically consider each of the items, then mark your answer in the space provided on the answer sheet.

If you strongly agree, blacken the space under "A".

If you agree, blacken the space under "B".

If you are undecided or uncertain, blacken the space under "C".

If you disagree, blacken the space under "D".

If you strongly disagree, blacken the space under "E".

Please use an IBM or a soft #2 lead pencil for answering.

For reasons of confidentiality, the IBM answer cards are prenumbered and the number is assigned to your name. It is not necessary to put your name on the answer sheet. Please return the IBM answer card to Mr. Donald T. Suit, Kaye 105. You may keep the test booklet if you wish. Thank you for your assistance.

a=strongly agree, b=agree, c=undecided, uncertain, d=disagree, e=strongly disagree

---

1. The hypnotized subject can be made to feel that his extended arm is so heavy that it falls in spite of his efforts to keep it up.

2. The hypnotist can cause a subject's clasped hands to stick together, so tightly that the subject cannot separate them.

3. Extreme thirst can be created under hypnosis and the thirst can be removed by an imaginary glass of water.

4. With a few words by the hypnotist, the subject can be rendered unable to speak his own name.

5. In a trance, the subject can be paralyzed so that he cannot move regardless of how hard he tries.

6. A subject can be made to perform acts on signal, even when he is no longer hypnotized.

7. A hypnotist can make the subject have amnesia (memory loss) for any one thing or for all things that occurred during hypnosis.

8. A hypnotized subject's limbs can be made so rigid that they cannot be bent without breaking the bones.

9. In a trance state, a subject's limbs can be made to feel so light that he cannot stop them from floating upward.

10. When hypnotized, a subject's separated hands can be made to behave as magnets so strong that he cannot keep them apart.

11. A subject can be made to feel, hear, and see an imaginary insect when hypnotized. This illusion is so strong that he will strike the air and brush his face to get rid of the insect.

12. Endocrine gland secretion can be stimulated through the use of hypnosis.

13. A person can perform feats of endurance that are usually impossible when he is not hypnotized.

14. When hypnotized, a person can be regressed (taken back to an earlier age level).

15. When a subject is hypnotized, hallucinations of voices and music can be produced.

16. Under hypnosis, a subject can be regressed to an age level where he loses control over his eliminative functions.

17. In a trance state, a subject can completely and accurately recall the day on which any specific birthday fell and what food he consumed that day.

18. The hypnotic subject can frequently be made to indulge in anti-social or criminal acts.

19. A hypnotized subject can be made to have "selective hallucinations"; for example, he can be made to forget all of his friends whose names begin with a certain letter of the alphabet.

20. A person can be made immune to pain by hypnosis so that he will not feel a needle inserted through his tongue or even a nail through his palm.

21. The hypnotic subject can become "dissociated"; that is, he can see himself in two different places at once as if he were two separate personalities and can describe what each one of him thinks of the other.

22. A hypnotized subject can see in his 'minds eye' an entire movie completely from beginning to end in the space of a few seconds. He actually sees, hears, and has the same emotional experiences that he had when he first saw the movie.

23. A hypnotized subject can perform "automatic writing"; that is, his hand can be controlled by his subconscious while he reads or performs some other task.

24. A subject can give a lecture, paint a picture, or take a test while under hypnosis.

25. A person can be made temporarily colorblind through hypnosis.

26. Temporary deafness can be produced by the hypnotist.

27. A subject can be made temporarily blind by the hypnotist.

28. Pain can be produced in any part of the body either during a trance or after the subject is awake.

29. Hives, wheals (a raised ridge), rash (allergic reactions of the skin) can be made to disappear through hypnosis.

30. When hypnotized, blisters can be made to appear on the skin.

31. The heartbeat can be increased or decreased in a trance state.

32. A hypnotized subject can be made to feel comfortable and warm while being exposed to cold.

33. Skin temperature can be raised or lowered in a trance.

34. Cardiac block (heart stoppage) can be produced in some hypnotized subjects.

35. Herpetic blisters (cold sores) can be made to appear as a result of suggestions given during hypnosis.

36. Warts can be removed using hypnotic therapy without the use of drugs or surgery.

37. A subject can be convinced that he is an animal and will behave as the animal that he thinks he is.

38. Bleeding can be stopped or controlled in injuries by hypnosis.

39. A hypnotized subject's body can be made so rigid that it will support the weight of a person when used as a bridge between two chairs.

40. In certain cases, functional blindness can be cured through trance suggestions.

41. In specific instances, paralysis can be removed by the use of hypnosis.

42. A hypnotized subject can be made intoxicated by drinking tap water which he has been told is vodka or gin.

43. Many cases of amnesia can be cured with hypnosis.

44. Painless childbirth is possible through the use of hypnosis.

45. Major surgical (i.e. appendectomy, amputation, etc.) operations can be performed without anesthesia by using hypnosis.

46. With a few exceptions, anyone can be hypnotized.

47. You would probably be a good hypnotic subject.

48. In some cases, it is possible to achieve hypnosis without the cooperation of the subject.

49. Temporary mental illnesses and intense fear reactions can be induced by hypnosis.

50. Resistance to viral infections can be lowered through suggestions to a hypnotized subject.

APPENDIX B

ANALYSIS OF VARIANCE - COMPUTER PROGRAM

Analysis of variance means and SD's for subgroups with unequal or equal N

```
                    DISK OPERATING SYSTEM/360 FORTRAN   360N-FO-451  CL 3-4

C ONE WAY ANALYSIS OF VARIANCE, XBAR, SD, N MAY BE EQUAL OR UNEQUAL      AVAR01
C  DATA MUST BE PUNCHED BY ROW, NOT COLUMN                               AVAR01
C  BY SIGMUND TOBIAS, SCHOOL OF ED. CITY U. OF NEW YORK
C  MODIFIED BY C J W HARRIS NORTHERN MICH. UNIV. 120968
C                                                                       ANOVA1
C             PROGRAM MODIFICATION FOR BASIC FORTRAN IV 360/25 082369   ANOVA1
C             NORTHERN MICHIGAN UNIVERSITY MARQUETTE, MICH C J W HARRIS ANOVA1
C                                                                       ANOVA1
      DIMENSION NAME(10), XIN(10)                                        ANOVA1
    1 INDEX = 0                                                         AVAR01
  900 FORMAT ('1' 30X 20HANALYSIS OF VARIANCE)                          ANVAR01
      WRITE ( 3, 900 )                                                   ANOVA1
    2 INDEX = INDEX & 1                                                 AVAR01
=> 100 FORMAT ( 2I5, F5.0, 10A4 )                                       ANOVA1
      READ ( 1, 100 ) K, INDEX2, ROUND, NAME                             ANOVA1
C                                                                       ANOVA1
C             K = NO. OF GROUPS PER ANOVA  INDEX = INDEX TO THE ARRAY    ANOVA1
C             FOR X IN THE I/O   ROUND = THE ROUND OFF AMOUNT           ANOVA1
C             NAME = THE PAGE TITLE OR RUN TITLE                        ANOVA1
C                                                                       ANOVA1
  110 FORMAT ( ' ' T21, 10A4 )                                          ANOVA1
      WRITE ( 3, 110 ) NAME                                              ANOVA1
    3 SXA = 0                                                           AVAR01
      SXSQA = 0                                                         AVAR01
      HOLD = 0                                                          AVAR01
      SFN = 0                                                           AVAR01
      M = 0                                                             AVAR01
```

```
 10 SX = 0                                                                  AVARO1
    SXSQ = 0                                                                AVARO1
    M = M & 1                                                               AVARO1
    FN = 0                                                                  AVARO1
    LASCD = 0                                                               AVARO1
 30 CALL VARRD( XIN, LASCD )                                                 ANOVA1
    IF(LASCD) 32, 31, 32                                                    AVARO1
 31 FN = FN & 1.                                                            AVARO1
    X = XIN(INDEX2)                                                          ANOVA1
    SX = SX & X                                                             AVARO1
    SXSQ = SXSQ & X * X                                                     AVARO1
    GO TO 30                                                                AVARO1
 32 XBAR = SX / FN & ROUND                                                  AVARO1
    VAR = ( FN * SXSQ - SX * SX ) / ( FN*( FN - 1.) ) & ROUND               AVARO1
    SD = SQRT(VAR) & ROUND                                                  AVARO1
    SXP = SX & ROUND
    SXSQP = SXSQ & ROUND
    N = FN                                                                  ANVARO1
    IF ( M - 1 ) 35, 35, 36                                                 AVARO1
901 FORMAT ('0' I2, 5X 1HN 6X 4HMEAN 7X                                     ANVARO1
9011      3HVAR 8X 2HSD 5X 5HSUM X  3X 7HSUMX SQ     )                     AVARO1
 35 WRITE ( 3, 901 ) INDEX                                                   ANOVA1
902 FORMAT( ' ' I3, I5, 3F10.2, 2F10.2 )                                    ANOVA1
 36 WRITE ( 3, 902 ) M, N, XBAR, VAR, SD, SXP, SXSQP                         ANOVA1
 40 SXA = SXA & SX                                                          AVARO1
    SXSQA = SXSQA & SXSQ                                                    AVARO1
    HOLD = HOLD & (SX * SX / FN )                                           AVARO1

    SFN = SFN & FN                                                          AVARO1
 50 IF( M - K ) 10, 60, 60                                                  AVARO1
 60 COR = SXA * SXA / SFN                                                   AVARO1
    TSSQ = SXSQA - COR                                                      AVARO1
    BSSQ = HOLD - COR                                                       AVARO1
    WSSQ = TSSQ - BSSQ                                                      AVARO1
    A = K                                                                   AVARO1
```

```
      DF1 = A - 1.                                                          AVARO1
      DF2 = SFN - A                                                         AVARO1
      DF3 = SFN - 1.                                                        AVARO1
      BMSQ = BSSQ / DF1
      WMSQ = WSSQ / DF2
      F = BMSQ / WMSQ & ROUND                                               AVARO1
 9030FORMAT('0' 2X 6HSOURCE 9X 2HDF 4X 10HSUM OF SQS 6X 7HMEAN SQ           ANOVA1
 9031     / 11H TREATMENTS F9.0, 1X 2F13.0,                                 AVARO1
 9032     / 6H ERROR 5X    F9.0, 1X 2F13.0,                                 AVARO1
 9033   // 6H TOTAL 5X     F9.0, 1X  F13.0,                                 AVARO1
 9034   / / 4H F = F10.2 / )                                                 AVARO1
      WRITE (3, 903) DF1, BSSQ, BMSQ, DF2, WSSQ, WMSQ, DF3, TSSQ, F         ANOVA1
      GO TO 2                                                               ANOVA1
      END                                                                   AVARO1
      SUBROUTINE VARRD( X, LASCD )                                          VARRD1
      DIMENSION X(10)                                                       VARRD1
  901 FORMAT( 10F5.0, T79, I2 )                                             VARRD1
      READ ( 1, 901 ) X, I                                                  VARRD1
      IF( I -   99 ) 10, 9, 10                                              VARRD1
    9 LASCD = -9                                                            VARRD1
      GO TO 999                                                             VARRD1
   10 LASCD = 0                                                             VARRD1
  999 RETURN                                                                VARRD1
      END                                                                   VARRD1
```

Note - VARRD is a called subroutine. The original IBMUUsers Library Program (37), was found to contain several errors. These errors were corrected and a new program was constructed for the 350 computer. When using this program, carefully examine the produced means to check for rounding errors and addative errors due to computer differences.