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ABSTRACT

This study evaluated personality variables that underlie hypnotic susceptibility. It was correlational, did not require ongoing contact with participants, and included a validation study as an integral component. The subjects were 359 college students (250 in the original sample and 109 in the cross validation study) taking undergraduate courses in educational psychology, educational statistics, and tests and measurements at the University of Alabama (Tuscaloosa). The Minnesota Multiphasic Personality Inventory-2 (MMPI-2), the Melei and Hilgard Questionnaire (demographic and attitudinal measures), and the Harvard Group Scale of Hypnotic Susceptibility were administered. The MMPI-2 scales, attitudes toward hypnosis, predictions of hypnotizability, and demographic variables were correlated with scores on the Harvard Scale. Stepwise multiple regression was used to maximize the ability of the variables to predict hypnotic susceptibility. Pearson product-moment correlations were computed. Attitudinal variables were consistently related to susceptibility, although the practical significance was marginal, with these measures accounting for only 10 to 13 percent of the variance in scores on the Harvard Scale. No consistent relationships were found between MMPI-2 variables and hypnotic susceptibility. The MMPI-2 variables explored included response set, existing MMPI-2 scales both singly and in combination, and individual items on the instrument. Included are 3 tables and 54 references. (RLC)

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Hypnotic Susceptibility and Personality as Measured by the MMPI-2

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Investigators of hypnotic phenomena have always felt the need for an objective method by means of which the hypnotizability of the individual subject might be reliably forecast. (Brenman and Reichard, 1943, p.18?)

Since the above statement was made almost fifty years ago, the search for measurement tools to understand, assess, and predict hypnotic susceptibility has continued. The reasons why some people retain the ability to be hypnotized deeply while others surrender the ability to some degree has been the focus of literally hundreds of studies (reviewed in: Deckert & West, 1963; Hilgard & Hilgard, 1965; Spanos & Chaves, 1989). The great majority of older prepubescent children are capable of being hypnotized deeply (London, 1962; Moore & Lauer, 1963). During adolescence the majority of people begin losing the ability to be hypnotized (Barber & Calverley, 1963). By late adolescence, people have attained their adult hypnotizability level which tends to be extremely stable for the remainder of their lives (Morgan, Johnson & Hilgard, 1974; Berg & Melin, 1975; Piccione, Hilgard & Zimbardo, 1989). While these studies have produced some knowledge as to the nature of hypnotic susceptibility, an understanding of susceptibility is highly incomplete. The personality determinants which underlie the differences in hypnotic susceptibility are not well understood. Neither is there the ability to accurately predict hypnotizability through personality testing.

The purpose of this research is to determine the personality variables which underlie hypnotic susceptibility. The

measurement of the underlying personality structures related to hypnotizability presents a classic problem in research. Hypnotizability is one of the most stable personality characteristics in adults, similar in stability to IQ (Piccione et al, 1989). However, its effective measurement through personality testing has been elusive. If susceptibility could be related to a personality test, the personality determinants of hypnotizability could be better understood.

Hypnotic susceptibility is not solely determined by ability. Like most human behavior there is an interaction of both ability and attitude. This is demonstrated by the fact that highly susceptible subjects can resist hypnosis and refractory subjects who are highly motivated to be hypnotized are often unable to achieve it (Melei & Hilgard, 1964). Hence, research on personality variables related to hypnotic susceptibility should include measurements of attitude to control for the covariance of personality and attitude.

#### Review of the Literature

##### Attitudes Toward Hypnosis and Susceptibility:

Some investigators of hypnotizability have claimed that susceptibility has both an ability and an attitudinal component (White, 1937; Shor, Orne, & O'Connell, 1962; Spanos & Barber, 1974; Sheehan & Perry, 1976; Shor, Pistole, Easton, & Kihlstrom,

1984). Just as hypnotic abilities are resistant to change, there is research which demonstrates that attitudes toward hypnosis may also be quite difficult to change (Spanos, Cross, Menary, Brett & de Groh, 1987).

London was the lead investigator in two studies (London, 1961; London, Cooper, & Johnson, 1962) which demonstrated that interest in being a subject in hypnosis research and past experience with hypnosis were both significantly correlated with hypnotizability. Similar research (Melei & Hilgard, 1964) demonstrated that positive attitudes toward hypnosis were significantly ( $p < .01$ ) correlated with susceptibility. A similar study (Diamond, Gregory, Lenney, Steadman & Talone, 1974) demonstrated that hypnotic susceptibility was moderately highly correlated ( $r = .41$ ) with susceptibility. However, such correlations have been questioned based on evidence which suggests that the relationship between hypnotizability and attitudes and personality variables may be non-linear (Perry, 1977; Hilgard, 1979; Spanos et al, 1987; de Groh, 1989). De Groh, for example, found that the distribution of vividness of imagery plotted against susceptibility was not linear, but fan shaped. If nonlinear relationships were common between hypnotic susceptibility and other variables, it would help explain the difficulty in cross validating many of the findings in this area

of research.

Expectations of susceptibility have also been studied as a specialized type of attitude related to hypnotizability. Melei and Hilgard (1964) studied the ability of subjects in susceptibility research to accurately predict their hypnotizability. They reported that females could predict consistently their own susceptibility better than males. Using Form A of the Stanford Scale, the predictions of females with no experience with hypnosis produced a correlation with their actual susceptibility of  $+0.26$  ( $p < .01$ ) while their male counterparts produced correlations of  $+0.16$  ( $p < .05$ ). A similar analysis for subjects previously hypnotized yielded a correlation of  $+0.65$  ( $p < .01$ ) for females and  $+0.32$  for males (NS). The criteria of "hypnotic experience" was dichotomized and no attempt was made to classify experience according to research, clinical use, or entertainment.

#### Hypnosis and Psychological Testing:

A number of attempts have been made to discriminate between hypnotically refractory and susceptible individuals using psychological testing. While projective tests have not been particularly fruitful in the prediction of hypnotic susceptibility, limited success has been achieved with personality inventories. Attempts have been made with virtually

all of the major inventories, with the most promising results achieved with the Minnesota Multiphasic Personality Inventory (MMPI). Approaches used have included the study of the clinical scales, response sets, and supplemental scales. However, there has been an ongoing problem of difficulty in cross-validating the obtained results. There is no indication in the literature of an attempt to construct an MMPI (or MMPI-2) scale related to susceptibility.

The first positive result in discovering a relationship between hypnotic susceptibility and the MMPI was found by Sarbin (1950). Studying a sample of seventy subjects, he reported a significant chi square ( $p < .01$ ) between susceptibility and the Hy (Hysteria) scale of the MMPI.

Faw and Wilcox (1958) compared the MMPI clinical scales and overall adjustment on the MMPI. Students who rated themselves susceptible scored significantly lower than those who rated themselves unsusceptible on MMPI scale D and MF. Students observer-rated to be susceptible scored higher on Hy and lower on MF and Sc. They concluded that in general, hypnotic susceptibility was positively related to adjustment, except when hysterical symptoms were prominent.

Schulman and London (1963) administered the MMPI and the Stanford Hypnotic Susceptibility Scale (Stanford Scale), Form A

to 87 female undergraduate students. The result demonstrated only the Pd scale to be related to susceptibility, with the most susceptible receiving the lowest Pd scores. There was no indication from the data that hypnotizability had any relationship to adjustment as indicated by MMPI scores.

Hilgard, Lauer, & Cuca (1965) conducted a correlational study relating MMPI scores to susceptibility. No scales were significant for both males and females when analyzed separately, but some scales yielded low level significance for gender. Data from the total sample yielded a large number of correlations significant at the .05 level. Positive correlations were found for F, Hs, Pd, Pt, Sc, and Ma, while K yielded a negative correlation. It is interesting to note that this study's finding on Pd was totally opposite the finding of Schulman and London (1963). The only significant correlation for both genders was the total number of questions marked true (Sum True score). This response set was assumed to be a measure of acquiescence. In effect, the likelihood of a correlation between a score on a personality inventory and hypnotic susceptibility might be determined by the number of scale items keyed True (Block, 1965).

Lang and Lasovic (1962) related hypnotic susceptibility to a number of scales from five different personality inventories, including the MMPI Si. The Si score for males was



non-significant, while the score for females was significantly ( $p < .05$ ) correlated to susceptibility. Pooled male and female data were not significant. Lang and Lasovic suggested the possibility that the bimodal distribution of hypnotic susceptibility might be causing statistical problems with essentially two different normal distributions with different means superimposed upon one another. In effect, there is the possibility that the hypnotic susceptibility of susceptible and refractory subjects might be qualitatively different with a quantitative overlap in the distribution of the high end of the refractory and the low end of the susceptible.

In the midst of these contradictory positive results there have also been frankly negative results with the MMPI. Senter (1961) concluded that differential response to hypnosis within a refractory population could not be determined through the MMPI. Moore (1961) found no significant relationships between hypnotic susceptibility and the Welsh factor analytic scores A and R on the MMPI. In addition, Norris (1973) attempted to relate MMPI Pt scores to susceptibility and Zulli (1986) correlated the supplemental MMPI Es scale to hypnotizability. Both of these studies found no significant relationships.

Hypnotic susceptibility is one of the more stable personality variables. It appears to be related to attitudes,

expectations, and underlying personality structure. Despite this, there has been a failure of the principal personality tests to differentiate hypnotic susceptibility. While the results have often been negative and/or inconsistent, the MMPI has demonstrated the most potential to assess hypnotizability.

#### PROCEDURES

This study is correlational and did not require ongoing contact with participants. Total time commitment from the participants was approximately two and one-half hours. Because of the persistent problem described in the literature of failure to validate promising leads in the prediction of susceptibility through psychological testing, this study includes a validation study as an integral component of the research.

The subjects were adult volunteers with the great majority being college students. They were recruited by offering extra credit in courses in the Area of Behavioral Studies at the University of Alabama. Courses from which subjects were recruited were undergraduate Educational Psychology, Educational Statistics, and Tests and Measurements. Only the Tests and Measurements course is exclusively for education majors.

It was decided that two hundred-fifty valid MMPI-2s would be required to create the new scale, and an additional one hundred valid profiles would be required for the validation study. The

total number of subjects who were recruited and who subsequently participated was 398. Seventeen subjects were eliminated because of invalid MMPI-2 profiles (F or FB >23). Another twenty-two subjects were eliminated because of incomplete materials, such as excessive unanswered questions on the MMPI-2 or failure to fill out the required questionnaire. The resulting number of subjects was 359, 250 in the original sample and 109 in the cross validation sample. Membership in the two samples was determined through random assignment.

The original sample was 16.4% male and 83.6% female. The cross validation sample was 14.7% male and 85.3% female. A chi-square analysis established that there was no statistically significant ( $p \leq .05$ ) difference in gender composition between the two samples ( $X^2 = .06$ , 1 df). The original sample had a mean age of 21.9 years with a standard deviation of 4.7, while the cross validation sample had a mean age of 21.6 years and a standard deviation of 3.8. A t-test of independent means established that the age difference between the two samples was not statistically significant ( $t = .59$ , 357 df).

### Materials

#### MMPI

In 1989 a new MMPI, the MMPI-2, was released (Butcher et al, 1989; Butcher et al, 1990). It is believed that the MMPI-2 is

improved psychometrically over its predecessor and was the version of choice for this study.

The regular administration of the MMPI-2 yields six validity scores, ten clinical scores, ten content scores, and the supplemental scores the examiner desires. One week test-retest reliabilities for MMPI-2 scales have a mean of  $r_x = .81$  for males (.67 to .92) and  $r_x = .77$  for females (.58 to .91) (Greene, 1991).

#### Melei and Hilgard Questionnaire

Demographic and attitudinal measures were obtained through a questionnaire used previously by Melei and Hilgard (1964). It contains information on the gender and age of the subject, willingness to be hypnotized, prediction of hypnotizability, desire of the subject to learn his/her level of susceptibility, attitudes toward hypnosis, and past history of hypnosis.

#### Harvard Group Scale of Hypnotic Susceptibility

Hypnotic susceptibility was measured by the Harvard Group Scale of Hypnotic Susceptibility, Form A (Harvard Scale). The Stanford Hypnotic Susceptibility Scale, Form A, is the most widely used individual standardized measure of hypnotizability (Weitzenhoffer & Hilgard, 1959). It consists of a standardized induction procedure, non-threatening tasks, and an assessment of hypnotic depth following the procedure. The Harvard Scale (Shor & Orne, 1962) is a group induction adaptation of the Stanford

Scale, Form A. Both the Stanford and Harvard Scales yield a score between zero and twelve with a higher score indicative of greater hypnotic response. The comparability of scores on the Stanford and Harvard Scales is well established (Shor & Orne, 1963; Bentler & Hilgard, 1963; Bentler & Roberts, 1963; Coe, 1964).

The original norms for the Harvard Scale had a mean of 7.39 out of a possible high score of 12 (Shor & Orne, 1963). Norms in a cross validation study yielded a mean score of 5.93 (Coe, 1964). The difference in these normed mean scores was not statistically significant. The original sample and the cross validation sample of the present study yielded mean scores between these normative means (6.62 and 6.00 respectively).

Shor and Orne's original normative group for the Harvard Scale produced an internal consistency coefficient of .80, with Coe's cross validation yielding a similar value of +.77. The combined original sample and cross validation sample of the current study produced a somewhat lower value with a Cronbach's alpha of +.73.

It has been demonstrated (Coe, 1976) that the gender and race of the experimenter administering the induction are not relevant variables. Hence, these variables were not addressed in this study.

### Data Collection

Data collection occurred in the following steps:

1. The experimenter made a subject recruitment presentation of about five minutes duration at the start of selected Behavioral Studies classes. The presentation consisted of an explanation that a study would be conducted to investigate the personality differences which were related to responsiveness to hypnosis. It was explained that all subjects would complete a long personality test and would participate in a group hypnosis outside of regular class time. Times when subjects could elect to participate in the group hypnosis were provided.
2. Students were given the opportunity to volunteer as participants in the research. Each student who elected to participate was immediately given a manila envelope containing the informed consent statement, an MMPI-2 question booklet, and an MMPI-2 answer sheet. The answer sheet was already marked with a randomly generated subject number. Each subject was instructed to bring the envelope containing the signed consent and a completed answer sheet to the group hypnotic induction.
3. When subjects arrived at the designated classroom for the group hypnotic induction they were given a stapled response packet. The top sheet was the Melei and Hilgard questionnaire. The sheets that followed were the pages to the response booklet

for the Harvard Scale. Each subject was asked to record the number on his/her MMPI-2 in the number blank on the questionnaire and then answer the questionnaire. The subjects were instructed to not open the booklet after completing the questionnaire.

4. To allow for late arrivals, who would otherwise be disruptive, the Harvard Scale was started about ten minutes later than the advertised time. No late arrivals were admitted after the Harvard Scale was begun.

5. Consistent with the standardized instructions, an informal explanation of what would take place was conducted as well as an opportunity to ask questions. The explanation and question period lasted between five and ten minutes.

6. At the end of the explanation and question period, the Harvard Scale was read verbatim consistent with the instructions of the standardized administration.

7. Immediately upon completion of the Harvard Scale, the Harvard Scale response booklet was completed by the subjects.

8. Subjects were instructed to place the Harvard Scale response booklet, with its questionnaire cover sheet, in the manila envelope containing the consent form and MMPI-2 answer sheet.

9. When all papers had been put in the manila envelopes and collected, a discussion about the hypnotic experience was conducted, both to respond to the subjects' curiosity about the

hypnotic experience, and to allow for detection of negative sequelae. There were no negative sequelae reported or observed as a result of the hypnotic induction.

The Harvard Scale was given in University classrooms in eleven different administrations. The smallest group contained five subjects and the largest over one hundred.

#### Data Analysis

Previous research correlating hypnotic susceptibility and results of psychological testing has often produced results which have not been confirmed upon replication. The pattern of inconsistent and nonreplicable results suggests that the relationship between hypnotic susceptibility and personality variables may be non-linear (de Groh, 1989). Considerable attention was taken during the analysis of the data in this study to establish that the relationships were indeed linear.

When the MMPI-2, Harvard Scale, and attitudinal questionnaire were scored for each subject and ineligible subjects eliminated, two hundred-fifty subjects were randomly assigned to the original sample, with the balance of the subjects assigned to the cross validation sample. The original sample was then randomly divided into two subsamples of equal size.

The MMPI-2 scales, attitudes toward hypnosis, predictions of hypnotizability, and the demographic variables were correlated



with scores on the Harvard Scale. Stepwise multiple regression was employed to maximize the ability of these variables to predict susceptibility.

Procedures for the creation of new MMPI scales have been well outlined by Clopton (1978, 1979) and Butcher & Tellegen (1978). Since the criterion in MMPI scale construction is usually a natural dichotomy (e.g. child molester vs. non-molester) or a variable relatively difficult to quantify, most scales are constructed by ignoring all subjects not clearly identified as one of the dichotomized types and attempting to have items differentiate the extremes. In the present case, the data lend themselves to less specialized treatment. Hypnotic susceptibility was measured on an interval scale and MMPI-2 items were genuine dichotomies. Therefore, a Pearson product-moment (point biserial) correlation was computed for each of the 567 MMPI-2 questions and the Harvard Scale score.

The determination of an appropriate level of significance is a problem in the construction of new MMPI scales because of the large number of items. Using a .05 level of significance invites between 25 and 30 false positives to be included in the scale. This number is excessive and would greatly reduce the clinical utility of the scale. Establishing a .01 level of significance potentially establishes a large false negative effect. To handle

this dilemma in a way designed to maximize clinical validity, the data from the two hundred fifty subjects were randomly divided into two subsamples to create the new hypnotizability scale. The correlations were computed for each of the two groups of one hundred twenty-five subjects. Any MMPI-2 item significantly correlated at the .05 level of significance for both groups was to be included in the new scale. The intent was to compute Cronbach alphas for set of items with each item deleted and only those items contributing positively to the reliability of the new scale were to be retained. Because of the frequent finding in past research on hypnotizability and inventories that the gender of the subjects influences the results, correlation procedures that partialled out gender were utilized.

It was expected that once the items comprising the new scale were identified, the MMPI-2s would be scored for this new scale. Since new scales are only justified when they yield greatly improved predictive ability over existing scales (Wiggins, 1973; Graham, 1978), the predictive ability of the new scale was to be compared to the predictive ability of the existing scales both singly and in combination. The ability of the new scale to predict hypnotic susceptibility was then to be established on the cross validation sample. This cross validation sample was employed to confirm all statistically significant results

obtained with the original sample.

To test for a correlation between acquiescence as measured by the Sum True score on the MMPI-2 and hypnotic susceptibility, a Pearson product-moment correlation was computed between the total number of true responses marked on each of the original sample subjects' MMPI-2 response sheets and the total score on the Harvard Group Scale of Hypnotic Susceptibility (HGS). There was no evidence of a violation of the assumptions of linearity and homoschedasticity. For the 250 subjects a correlation of  $+0.09$  was obtained, which was not statistically significant.

Pearson product-moment correlations were computed between Harvard Scale scores and both age and gender. Age correlated  $-0.07$  and gender correlated  $-0.06$  (negative indicating relationship of feminine gender) with the scores on the Harvard Scale. Neither correlation was statistically significant.

Pearson product-moment correlations were computed between responses on the Melei and Hilgard questionnaire and scores on the Harvard Scale. Neither willingness to be hypnotized nor desire for feedback on hypnotic susceptibility were found to be significantly correlated with susceptibility. Estimations of hypnotic susceptibility were found to be significantly correlated with actual susceptibility yielding a correlation of  $+0.26$  ( $p < .0001$ ), with an  $r^2$  of just under  $.07$ . Further breakdown of

these results by gender and prior hypnotic experience is presented in Table 1. All correlations were positive and

Table 1

*Correlations of estimations of susceptibility and actual susceptibility for subjects, including gender and experience with hypnosis*

Subject Characteristics	n	r
All Subjects	250	+.26****
All Male Subjects	41	+.63****
All Female Subjects	209	+.15*
All with No Prior Exp	234	+.27****
Males with No Prior Exp	35	+.69****
Females with No Prior Exp	199	+.15*
All with Prior Exp	16	+.31
Males with Prior Exp	6	+.26
Females with Prior Exp	10	+.44

\*p<.05 \*\*p<.01 \*\*\*p<.001 \*\*\*\*p<.0001

statistically significant except for those with prior experience which was a small subsample (n=16). On cross validation estimations of hypnotic susceptibility also yielded a correlation

of +.26 ( $p < .01$ ). Table 2 presents the results by gender and prior hypnotic experience for the cross validation sample. The results of this analysis indicated that despite the consistent results for the overall cross validation subjects, the results of

Table 2

*Cross validation of correlations of estimations of susceptibility and actual susceptibility for subjects, including gender and experience with hypnosis*

Subject Characteristics	n	r
All Subjects	109	+.26**
All Male Subjects	16	+.06
All Female Subjects	93	+.26*
All with No Prior Exp	103	+.28**
Males with No Prior Exp	16	+.06
Females with No Prior Exp	87	+.28**
All with Prior Exp	6	-.07
Males with Prior Exp	0	--
Females with Prior Exp	6	-.07

\* $p < .05$     \*\* $p < .01$

some subgroups were inconsistent between the original sample and

the cross validation sample. The cross validation sample had only six subjects with previous hypnotic experience, but produced a negative correlation between estimate of hypnotizability and actual hypnotizability. The result for male subjects was a nonsignificant positive correlation.

Of the twelve attitudes towards hypnosis assessed on the questionnaire, only the attitude "Relaxing" was found to be correlated significantly with Harvard Scale scores, yielding a correlation of  $+0.16$  ( $p < .05$ ). This relationship was supported by cross validation with an even greater magnitude than the original sample, yielding a correlation of  $+0.27$  ( $p < .01$ ).

Using Melei and Hilgard's (1964) scoring system the overall results of the questionnaire were found to correlate  $+0.25$  ( $p < .01$ ) with hypnotic susceptibility. This is slightly less than the correlation between hypnotic susceptibility with estimations of susceptibility, which is one element of the total questionnaire score. However, on cross validation this correlation increased to  $+0.37$  ( $p < .0001$ ) producing an  $r^2$  of  $.14$ .

A multiple regression of the attitudinal variables on the questionnaire was conducted to determine the extent to which the questionnaire could account for the variance of Harvard Scale scores. The full regression model had an  $F_{(15,234)} = 1.70$ , ( $p < .05$ ) and

the model had an  $R^2 = .10$ . On cross validation the full regression model had an  $F_{(15,93)}=2.21$ , ( $p<.05$ ), with  $R^2 = .07$ . These results allow for the rejection of this null hypothesis. There was a statistically significant relationship between attitudes toward hypnosis and hypnotic susceptibility.

Pearson product-moment correlations were computed for each of the clinical, content, and major supplemental scales of the MMPI-2 with scores on the Harvard Scale. In the original sample,

Table 3

*Significant correlations of validity, clinical, content, and major supplemental scales on the MMPI-2 with Harvard Scale scores of hypnotic susceptibility for the original and cross validation samples*

MMPI-2 Scale	Orig n	Orig r	CV n	CV r
F	250	+.14*	109	+.08
Hs	250	+.12*	109	+.07
Mf (Females)	209	+.15*	83	+.18
Pa	250	+.14*	109	-.09
Es	250	-.15*	109	-.03
GM	250	-.18**	109	-.13
TRIN	250	+.12*	109	+.03

\* $p<.05$  \*\* $p<.01$

nine of the MMPI-2 scales were found to have statistically significant correlations with Harvard Scale scores. As displayed in Table 3, eight of the scales were significant at the .05

level. These scales were F, Hs, MF-female, Pa, HEA, BIZ, Es, and TRIN. GM was significant at the .01 level. On cross validation, none of these correlations was statistically significant.

To determine if items on the MMPI-2 with gender partialled out, would be significantly correlated with hypnotic susceptibility, the experimental sample was randomly divided into two subsamples. For each subsample of 125 subjects a correlation was computed between the response to each of the MMPI-2 items and the score on the Harvard Scale with gender partialled out. Any item characterized by a statistically significant ( $p < .05$ ) correlation in the same direction for both subsamples was determined to differentiate susceptibility. Such correlations were calculated for all 567 items on the MMPI-2. The only statistically significant items for both subsamples were 79, 189, and 271. However, items 79 and 189, while statistically significant for both subsamples, had correlations with opposite signs between the subsamples, leaving only item 271, "I think I feel more intensely than most people do" correlated consistently to Harvard Scale scores for both subsamples. When this item on the MMPI-2 was subjected to cross validation, there was no statistically significant relationship between responses to this item and scores on the Harvard Scale.



### Summary

The purpose of this study was to develop a better understanding of the personality determinants of hypnotic susceptibility. The beliefs of this researcher were that personality variables have a greater relationship to hypnotizability than attitudinal variables toward hypnosis. It was believed that the personality variables specifically measured by the MMPI-2 are related to hypnotic susceptibility. Further, it was assumed that past problems in validating relationships between paper and pencil tests and hypnotic susceptibility measures were caused by data characterized by nonlinearity and/or heteroschedasticity. These beliefs are not borne out by the data from this research.

The subjects were 359 undergraduate students in courses in Behavioral Studies at the University of Alabama. The data included attitudinal measures toward hypnosis, scores on the Harvard Group Scale of Hypnotic Susceptibility, and responses on the MMPI-2.

The overall results were that attitudinal variables were consistently related to susceptibility, although the practical significance ( $R^2$ ) was marginal with these measures accounting for only 10 to 13 percent of the variance in scores on the Harvard Scale. No consistent relationships of any kind were found between MMPI-2 variables and hypnotic susceptibility. MMPI-2 variables explored included response set, existing MMPI-2 scales both singly and in combination, and individual items on the instrument.

### Discussion

Much of the research on the personality determinants of

hypnotic susceptibility have been inconsistent. Promising leads with apparent face validity have often disappeared upon replication. A review of the literature suggested several likely outcomes for this study.

It was probable that a noncritical response set on the MMPI-2 (acquiescence) would be related to susceptibility. Based on the research literature (Frankel, 1974; Frankel & Orne, 1976; Frankel, 1978; Foenander et al, 1980; John et al, 1983; Kelly, 1984; Gerschman et al, 1987) it would not be surprising for the Phobia scale of the MMPI-2 to be related to hypnotizability. Past studies which have produced inconsistent correlations with a number of scales including MF, Pd, Hy, D, F, Hs, Pt, Sc, and Ma, suggested the likelihood that some existing scales might well be related to susceptibility. The breadth of the item pool of the MMPI-2 strongly suggested that some items would be related to susceptibility, since adult susceptibility is one of the most stable personality variables. Despite these reasonable assumptions based on the literature, none were borne out by the data. It does not appear that the MMPI-2 is a fruitful instrument for the study of personality variables related to hypnotic susceptibility.

The long history of ephemeral relationships between paper and pencil personality variables and hypnotic susceptibility caused this researcher to strongly suspect that the data were not characterized by linearity and homoschedasticity. However, review and analysis of plots of residuals found no such violations of the assumptions of regression models.

The positive findings of this study were related to attitudinal measures. Melei and Hilgard's 1964 study was

replicated to control for the impact of attitudinal differences. Melei and Hilgard found low positive correlations between attitude and susceptibility. They cautioned that modest relationships between personality variables and hypnotic susceptibility exist, but researchers should investigate for the role of an attitudinal covariate.

The original study by Melei and Hilgard found that attitudes toward hypnosis were predictive of susceptibility for females, but not males and expectations of susceptibility yielded significant but low positive relationships for both sexes. The gender differences found in the original study appear to be a statistical artifact, as no such differences were found in this replication. Expectations of hypnotizability consistently produced a correlation of  $+0.26$  for both the original and cross validation sample. Attitudes toward hypnosis yielded correlations that ranged from  $+0.25$  to  $+0.37$ . These results are consistent with the Melei and Hilgard results except for the gender differences.

#### Suggestions for Further Study

There is dispute in the literature as to whether or not susceptibility as measured by the Harvard Scale is a continuous variable or is two distinct distributions superimposed on one another. A thorough psychometric analysis of the Harvard Scale, including a factor analysis, would help determine whether or not hypnotizability as measured by this instrument is unidimensional.

Particularly intriguing is the lack of positive results on the MMPI-2 Phobia scale given the broad base of support in the literature for the relationship between susceptibility and phobias. This suggests the need for an exploration of the

validity of the new Phobia scale.

The overall failure of the MMPI-2 to yield consistent relationships with hypnotic susceptibility suggests that the MMPI-2 might be an inappropriate instrument to measure the underlying personality structures which influence hypnotic susceptibility. It is also possible that attention should be redirected toward focusing on the interaction between personality and attitude. Research which examines attitudes as a moderator variable affecting personality variables may well require the development of a more sophisticated attitudinal measure than was employed in this study. In the meantime, an attempt could be made to derive an MMPI-2 scale only using subjects who indicate a highly positive attitude toward hypnosis and an expectation of hypnotic susceptibility to control for the attitudinal variable.

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