

CORRELATES OF IMAGINATIVE AND HYPNOTIC SUGGESTIBILITY IN CHILDREN

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Abstract

As an extension of previous research by Braffman and Kirsch (1999) with adults, this study investigated the relationship between suggestibility and hypnotizability in a sample of 44 child psychiatric patients. Participants were assessed for various correlates of imaginative suggestibility while controlling for nonhypnotic suggestibility. Overall, nonhypnotic suggestibility accounted for most of the variance in hypnotizability ($r = 0.73$; $p < 0.001$), and vividness and absorption were found to predict unique variance in hypnotizability ($r = 0.28$; $p < 0.001$) when nonhypnotic suggestibility was controlled. These results support the view of hypnotic responsiveness as reflecting a continuum of suggestibility and serve to further weaken the contention that hypnosis produces an altered state of consciousness.

Key words: fantasy, hypnosis, hypnotizability, imagination, suggestibility

Correlates of imaginative and hypnotic suggestibility in children

For over forty years, hypnotizability scales have been used in both clinical and research settings. By assessing an individual's responses to a set of standardized suggestions that follow a standardized induction, a measure of hypnotic talent or ability is obtained (e.g. Weitzenhoffer and Hilgard, 1959; Morgan and Hilgard, 1979). As standardized scales came into common use, it became apparent that hypnotizability was relatively stable. For example, a test-retest correlation of $r = 0.71$ has been reported following a retest interval of 25 years (Piccione, Hilgard and Zimbardo, 1989). Also, different measures of hypnotizability are highly inter-correlated, typically above $r = 0.60$ (Bowers, 1983). Given the stability of hypnotizability, a trait-hypothesis has figured prominently in hypnosis research. Accordingly, investigations have focused on understanding the personality and cognitive correlates of hypnotizability.

If hypnotizability were a relatively stable construct (even though people showed different levels of responsiveness), then identifying the correlates or determinants of hypnotizability could advance understanding of individual differences in suggestibility. Sarbin and Coe (1972) hypothesized that differences in hypnotic responding could be accounted for by the extent to which people became involved or absorbed in a hypnotic role. Barber, Spanos and Chaves (1974) argued that individual differences in hypnotic

responsiveness could be explained in terms of absorption and imaginative involvement, constructs later refined by Wilson and Barber (1981; 1983) and by Lynn and Rhue (1988) in their studies of fantasy prone persons. Relatedly, dissociative processes have been both conceptually and empirically linked to hypnotic responsiveness, as reflected in the moderate to high correlations obtained between measures of dissociation and imagination (Lynn, Martin and Frauman, 1996).

For more than 30 years, clinicians and researchers have regarded imaginative involvement as a central feature of hypnosis with children (Hilgard, 1970). Indeed, highly suggestible children tend to be quite imaginative. Consistent with the trait-hypothesis, much of the research with children has focused on the relationship between personality variables related to imagination (e.g. fantasy proneness, absorption) and hypnotizability. Moderate correlations between these variables have been reported (LeBaron, Zeltzer and Fanurik, 1988; Plotnick, Payne and O'Grady, 1991). Unfortunately, these studies have suffered from a methodological weakness common to nearly all past research on hypnotizability: the investigators failed to control for baseline nonhypnotic suggestibility.

Kirsch (1997) has recently observed that the conceptual definition of hypnotizability, as an *increase* in suggestibility produced by hypnosis, does not square with the operational definition of hypnotizability as the score on a standardized hypnosis scale after a hypnotic induction. Whereas commonly used hypnotizability scales measure suggestibility following an induction (Kirsch, 1996), they do not measure increases in suggestibility over and above nonhypnotic suggestibility in response to imaginative suggestions contained in hypnosis scales. In other words, it may be accurate to say that hypnotizability scales measure imaginative suggestibility, rather than hypnotizability, as conceptualized as an increase in suggestibility following an hypnotic induction relative to baseline suggestibility in responses to nonhypnotic suggestions. As Kirsch has pointed out, this is not a new issue but was originally observed by Weitzenhoffer (1980) in his critique of the Stanford Scales.

The present investigation is a replication and downward extension of Kirsch's (1996) and Braffman and Kirsch's (1999) research with adult subjects. This research revealed that the lion's share of variability in responses to suggestions that followed an hypnotic induction could be accounted for in terms of individuals' responses to the same suggestions administered in a nonhypnotic context. The present study is the first to examine correlates of imaginative suggestibility in children while statistically controlling for baseline nonhypnotic suggestibility.

Method

Design

All participants experienced the two experimental conditions sequentially. The order of the conditions was not counterbalanced. Braffman and Kirsch (1999) demonstrated that the presentation of the hypnotic condition prior to the nonhypnotic condition inhibited nonhypnotic responding while the presentation of the nonhypnotic condition prior to the hypnotic condition did not significantly affect hypnotic responding. Because our central concern was to examine how nonhypnotic suggestibility and other variables predict hypnotic suggestibility, counterbalancing (i.e. presenting the hypnosis condition first) would have potentially inhibited nonhypnotic suggestibility, thus defeating the purpose of the study.

Participants

Forty-four child psychiatric patients (16 females and 28 males) between the ages of 8 and 15 ($M = 11.23$; $SD = 2.70$) were included in the final data analysis. Forty-one patients were Caucasian (93%), 2 were Hispanic (5%), and 1 was African American (2%). A total of 49 patients completed the project. Three patients did not understand or refused to participate in the suggestibility scales, and data for 2 subjects met the conditions for outliers (Tabachnick and Fidell, 1996) and were eliminated in order to improve the normality of the variables. Table 1 summarizes the frequency distribution of DSM-IV diagnoses for the participants in the study.

Table 1. Frequency distribution of subjects' DSM-IV diagnosis on admission

DSM-IV diagnosis	Frequency	Percentage
MOOD DISORDERS	32	72.8
Dysthymic disorder	1	2.3
Major depressive disorder	4	9.1
Depressive disorder, NOS	1	2.3
Mood disorder, NOS	23	52.3
Bipolar disorder	2	4.5
Cyclothymic disorder	1	2.3
OTHER DISORDERS	12	27.2
Post-traumatic stress disorder	2	4.5
Polysubstance dependence	3	6.8
Attention-deficit/hyperactivity disorder	3	6.8
Oppositional defiant disorder	4	9.1

*Measures***The Stanford Hypnotic Clinical Scale for Children (SHCS-C)**

The SHCS-C (Morgan and Hilgard, 1979) was used to assess imaginative suggestibility. The SHCS-C was administered twice: first, without the induction and second, with the induction. Validity is based on an $r = 0.67$ correlation between the SHCS-C and the widely used adult scale, the Stanford Scale of Hypnotic Susceptibility, Form A (Morgan and Hilgard, 1979).

Children's Fantasy Inventory (CFI): Absorption and Vividness Scales

The CFI is a 45-item questionnaire developed by Rosenfeld, Huesmann, Eron, and Torney-Purta (1982) to measure children's imaginative processes. Two scales from the CFI were used in the present study (Absorption and Vividness). Both scales have been used in previous child suggestibility research (Plotnick, Payne and O'Grady, 1991) and parallel similar constructs studied with adults (Tellegen and Atkinson, 1974; Lynn and Rhue, 1988). One year test-retest reliabilities range from $r = 0.39$ to 0.59 . Internal consistency ranges from $r = 0.42$ to 0.70 .

The Fantasy Questionnaire (FQ)

The FQ (LeBaron et al., 1988) is derived from Singer's Imaginative Play Predisposition

Interview (Singer, 1973) and consists of 7 dichotomous items which are administered in interview format. The questions focus on the respondent's experiences between the ages of approximately 4 to 7 years, so older children and adolescents were asked to respond to these retrospectively. Normative data are limited to correlations with suggestibility ($r = 0.39$ to 0.53 ; LeBaron et al., 1988; Plotnick et al., 1991).

The Child Dissociative Checklist (CDC)

The CDC (Putnam, Helmers and Trickett, 1993) is a 20-item parent report inventory assessing several domains of dissociative behaviour including amnesias, rapid shifts in demeanor, spontaneous trance states, and hallucinations (Putnam et al., 1993). The CDC is the most extensively validated and most widely used research measure of dissociative processes in children (Hornstein and Putnam, 1992; Putnam et al., 1993). Putnam et al. (1993) reported a 1-year test-retest reliability coefficient of $r = 0.65$, and the scale has strong internal consistency and documented construct ($r = 0.73$) and concurrent validity.

Wechsler Intelligence Scale for Children – 3rd Edition: Vocabulary Subtest (WISC-III)

The WISC-III correlates significantly with both Verbal IQ ($r = 0.87$) and Full Scale IQ ($r = 0.79$; Wechsler, 1991), and was used in the present study as an approximate measure of intelligence. This scale was included insofar as past research on intelligence and hypnotic responsiveness has proven inconclusive (London, 1965; Jacobs and Jacobs, 1966).

Patient background

Following the administration of the suggestibility scales and interview questionnaires, relevant demographic and diagnostic information was recorded from the patient's chart (e.g. birth date, gender, age, admitting diagnosis).

Procedure

The primary investigator served as the examiner and was naïve with respect to the patient's diagnosis. After parental consent was obtained and the CDC was completed, each subject was seen individually. The following explanation was given to each subject:

We are doing a research study on imagination to learn more about how it works. We are asking the patients in our programme do some exercises with their imaginations. It will take about 45 minutes to an hour. I'll also be asking you some questions and giving you a short vocabulary test. You don't have to participate, however, most of the kids enjoy it.

If the subject consented to participate, the SHCS-C was administered, first without the induction procedure. No mention was made at this point about the second procedure (hypnotic induction). The following directions were given:

I'm going to help you learn some interesting things about imagination today. I will ask you to think of some different things, and we will see how your imagination works. Some people find it easier to imagine some things than other things. We want to find out what is most interesting to you. It works best if you close your eyes. (Adapted from Morgan and Hilgard, 1979.)

After completing the seven tasks of the SHCS-C, the scale was re-administered to each subject. However, this time the complete induction was provided, as outlined by Morgan

and Hilgard (1979). After the SHCS-C was given, the CFI and FQ were administered in interview format, followed by the WISC-III Vocabulary subtest. Finally, subjects were given the opportunity to talk about what they had experienced or to ask questions.

Results

Descriptive statistics

Scores on the WISC-III Vocabulary subtest ranged from 1 to 14 ($M = 9.25$; $SD = 2.71$). The mean score for nonhypnotic suggestibility was 4.30 ($SD = 1.97$) while the mean score for hypnotic suggestibility was 4.93 ($SD = 1.91$). Scores from the two conditions were highly correlated ($r = 0.83$, $p < 0.001$). These results are consistent with the SHCS-C means of between 4 and 6 (depending on age) reported by Morgan and Hilgard (1979). See Table 2.

Figure 1 portrays a joint distribution of induction and no-induction SHCS-C scores. Scores for subjects who achieved the same score on both conditions were plotted on the diagonal. Scores for those subjects who were more suggestible with hypnosis were plotted above the diagonal. There were no subjects who displayed less suggestibility with hypnosis (hence, no scores were plotted below the diagonal).

Associations between suggestibility and imaginative involvement

A standard multiple regression procedure was employed in order to predict hypnotizability (defined as hypnotic suggestibility with nonhypnotic suggestibility controlled) as well as nonhypnotic suggestibility on the basis of the hypothesized predictor variables. A power rating of 0.80 was calculated, based on a large predicted effect size, $\alpha = 0.05$, 5 predictor variables, and 44 subjects. The correlation coefficients are displayed in Table 3.

These data indicate that the variables related to imaginative involvement (Fantasy, Vividness, and Absorption) were all significantly associated with one another. Dissociation and Vocabulary were neither correlated with each other, nor with the imaginative involvement variables.

Table 4 displays the correlations of the imaginative and cognitive variables with nonhypnotic and hypnotic suggestibility. Vividness and Fantasy were significantly associated with nonhypnotic suggestibility, while Vividness, Fantasy, and Absorption were significantly correlated with hypnotic suggestibility. Neither Dissociation nor Vocabulary correlated significantly with suggestibility (hypnotic and nonhypnotic). In order to calculate hypnotizability, also displayed in Table 4, five regressions were performed using a two-variable simultaneous model. Each time, hypnotic suggestibility was regressed on nonhypnotic suggestibility and one of the imaginative involvement

Table 2. Descriptive data for predictor variables

Variable	M	SD	Minimum	Maximum	n
Fantasy (FQ)	3.59	1.59	0	6	44
Vividness (CFI: V)	3.61	2.83	0	9	44
Absorption (CFI: A)	6.23	2.88	1	12	44
Absorption+Vividness (CFI: A+V)	9.84	5.18	1	19	44
Child dissociative checklist (CDC)	11.40	6.39	1	27	40

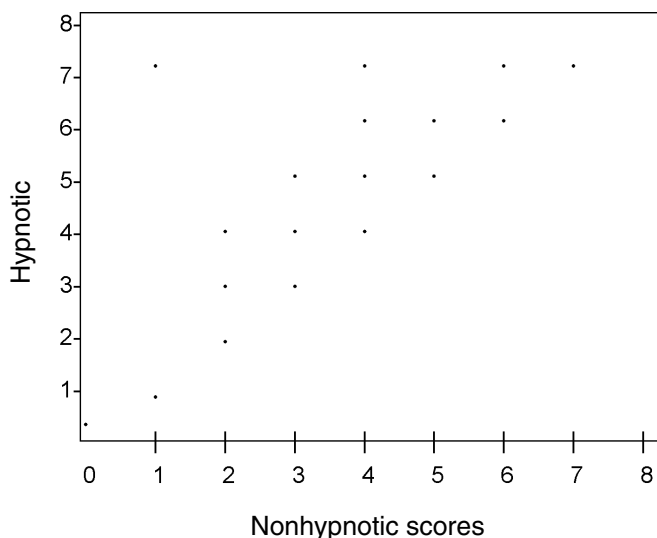


Figure 1. Joint distribution of hypnotic and nonhypnotic scores.

Table 3. Correlations between predictor variables

	Vividness	Fantasy	Dissociation	Vocabulary
Absorption	0.64***	0.58***	0.16	-0.21
Vividness	0.48***	0.05	-0.14	
Fantasy	0.21	0.08		
Dissociation	-0.33			

Note: ***= $p < 0.001$

Table 4. Associations between suggestibility and predictor variables

	Correlation		Beta
	Nonhypnotic suggestibility	Hypnotic suggestibility	Hypnotizability
Absorption	0.29	0.50***	0.28***
Vividness	0.38**	0.50***	0.22*
Fantasy	0.51***	0.52***	0.13
Dissociation	0.20	0.28	0.12
Vocabulary	0.07	-0.08	—

Note: * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$. The Beta statistics listed in the ‘hypnotizability’ column were generated by regressing each variable alone on hypnotizability when controlling for nonhypnotic suggestibility.

variables. Vocabulary was not used as a predictor of hypnotizability because of its very low, negative correlation with the dependent variable. Both Vividness and Absorption were found to be significantly associated with hypnotizability.

Regression was also used to build a model predicting nonhypnotic suggestibility from Absorption, Vividness, and Fantasy. Since Absorption and Vividness were highly inter-correlated and originated from the same scale, a combined variable was used (Absorption + Vividness). Only Fantasy emerged as a unique predictor of imaginative suggestibility ($r = 0.45$; $p < 0.01$) in this model, which reached statistical significance: $F(2, 41) = 7.35$, $p < 0.01$. The model accounted for 26% (23% adjusted) of the variance in nonhypnotic suggestibility.

Finally, hypnotic suggestibility was regressed on nonhypnotic suggestibility and Absorption + Vividness to build a model predicting hypnotizability. Again, Absorption and Vividness were included as one aggregate variable. Predictably, nonhypnotic suggestibility accounted for most of the variance ($r = 0.73$; $p < 0.001$). However, Absorption and Vividness also reached statistical significance in describing unique, additional variance ($r = 0.28$; $p < 0.001$) in hypnotizability. This model obtained statistical significance in accounting for 76% (75% adjusted) of the variance in hypnotizability: $F(41, 2) = 66.22$, $p < 0.001$.

Discussion

One of the most striking findings of the present study was the very high correlation between nonhypnotic and hypnotic suggestibility ($r = 0.83$; $p < 0.001$). The relationship is equivalent to findings reported by Weitzenhoffer and Sjöberg (1961) who observed very little increase in suggestibility when an induction was administered to adult subjects. In re-analyzing Weitzenhoffer and Sjöberg's raw data, Kirsch (1997) reported a correlation of $r = 0.80$ ($p < 0.001$) between nonhypnotic and hypnotic suggestibility. In Braffman and Kirsch's (1999) investigation, the correlation between nonhypnotic and hypnotic suggestibility was $r = 0.67$ and $r = 0.82$ for observed behaviour and subjective experience, respectively.

These findings are noteworthy given test-retest reliabilities of $r = 0.80$ to 0.85 reported for the Stanford Scales, including the SHCS-C (Weitzenhoffer and Hilgard, 1962; Olness and Kohen, 1996). If correlations between nonhypnotic and hypnotic suggestibility are equivalent to the test-retest reliability of the scales, then scales like the SHCS-C are arguably not valid measures of hypnotizability, at least as hypnotizability is conceptualized in the present investigation. In fact, in the current study, nonhypnotic suggestibility accounted for most of the variance in hypnotizability, bolstering the contention that the SHCS-C is a more valid measure of imaginative suggestibility than hypnotizability.

The current findings also highlight the relatively low power of the seven-item SHCS-C to discriminate between moderate and high responders. In the current study as well as previous investigations (Zeltzer and LeBaron, 1984; LeBaron, Zeltzer and Fanurik, 1988; Plotnick, Payne and O'Grady, 1991), the scale yields distributions skewed towards the high end of the scale. It is possible that a more difficult revision of the SHCS-C (that includes more items) would yield greater change scores. Zeltzer and LeBaron's (1984) revision of the SHCS-C included two additional items – posthypnotic amnesia and negative visual hallucination. However, in their evaluation of this revision with 42 children, Plotnick et al. (1991) found empirical support for only posthypnotic amnesia.

Only a few subjects in the current study showed a substantial increase in suggestibility following an induction. Interestingly, no subjects exhibited a decrease in suggestibility when an induction was administered. In their study with adults, Braffman and Kirsch (1999) reported a small but significant effect of hypnosis on suggestibility when nonhypnotic suggestibility was measured first (as in the present study). They also reported that a hypnotic induction decreased suggestibility for a minority of their participants. In the present study, response expectancies and attitudes towards hypnosis were not assessed because their measurement appeared to preclude parental consent for participation. Braffman and Kirsch (1999) found that response expectancy and motivation predicted behavioural response to hypnosis when nonhypnotic suggestibility was controlled. Furthermore, they reported that fantasy proneness and absorption were unrelated to an increase in hypnotic responsiveness. Consistent with a role theory of hypnosis (Sarbin and Coe, 1972), it might be argued that adults would be more susceptible to expectancies (both positive and negative) than children because of increased cultural experience with hypnosis.

Our research supports the usefulness of hypnotic suggestibility scales as valid, stable measures of imaginative suggestibility. However, it is legitimate to question the interpretation of hypnotic suggestibility scales. Kirsch (1997) has suggested two interpretations to guide future research. One alternative is to reinterpret hypnotizability scales as indexes of (nonhypnotic) imaginative suggestibility. The other alternative is to change the conceptual definition of hypnosis to include nonhypnotic suggestibility within the domain of hypnosis.

Our research permitted the examination of a number of potential correlates of hypnotic and nonhypnotic suggestibility. We found that absorption was positively related to hypnotic suggestibility but not to nonhypnotic suggestibility. Absorption also emerged as a unique predictor of hypnotizability when baseline suggestibility was controlled, findings consistent with Plotnick et al.'s (1991) report of a significant association between hypnotic responding and absorption ($r = 0.44$; $p < 0.01$). Interestingly, in the present study, absorption did not correlate significantly with imaginative suggestibility when an induction was not administered. This discrepant finding may reflect the role of absorption-related abilities in enhancing an individual's responsiveness to suggestion.

We also found that vividness of mental imagery was positively related to both nonhypnotic suggestibility and hypnotic suggestibility, and contributed unique variance to hypnotizability when baseline suggestibility was controlled. Plotnick et al. (1991) also reported a significant relationship between vividness and hypnotic responsiveness ($r = 0.53$; $p < 0.001$), using the same vividness scale as used in the present study with children. In general, stronger relationships between vividness and responsiveness to hypnotic suggestion have been reported in the studies involving children. Whereas it is tempting to conclude that children are more prone to use imagery in mental processing, most of the studies have involved relatively smaller sample sizes, raising the possibility of statistical artifacts. Thus, caution is warranted in interpreting the results of the present study pertinent to vividness of imagery due to methodological weaknesses inherent in using questionnaires to assess this multidimensional construct.

Although fantasy proneness was found to correlate with nonhypnotic and hypnotic suggestibility, when nonhypnotic suggestibility was controlled through regression, fantasy proneness did not significantly predict additional variance in hypnotizability. These findings are consistent with the moderate to strong correlations reported by others (LeBaron et al., 1988; Plotnick et al., 1991). Children who scored high in fantasy proneness engaged in frequent pretend play, read often, listened to stories read by their parents, had an imaginary

friend or toy, and/or believed in magic. Interestingly, the present study found an equally strong relationship between fantasy proneness and suggestibility whether or not an induction was administered.

In contrast, dissociative behaviour, as measured by the parent-completed Child Dissociative Checklist, was related to neither imaginative suggestibility nor hypnotizability. Although the sample mean approached the cutoff score (12), indicative of clinically-elevated dissociation (Hornstein and Putnam, 1992), there was a large standard deviation, reflecting the fact that extremely low and high scores were evidenced by a large proportion of the sample. The failure to establish a relationship between dissociative behaviour and hypnotic as well as nonhypnotic suggestibility is noteworthy insofar as dissociation plays an important role in contemporary definitions of hypnosis (e.g. Carlson and Putnam, 1989). Although this is the first investigation of the correlation of childhood dissociation and hypnotic responding, studies of adults have found low to modest correlations between dissociation and hypnotic performance (Nadon, Hoy, Register and Kihlstrom, 1991; see review in Carlson and Putnam, 1988).

London (1965) had previously reported a modest but positive correlation ($r = 0.43$) between IQ scores and suggestibility. However, in the present study, there was no evidence for an association between estimated intelligence and suggestibility.

The difficulties in securing approval and obtaining parental consent for the research had a number of noteworthy implications. First, a relatively small sample size was used in this study, thereby limiting the generalizability of the results. Additionally, the present results should be replicated with a non-psychiatric sample to extend the generalizability of the findings. The small sample also precluded the inclusion of additional variables into regression equations (e.g. birth order, diagnosis, and age). It would also have been preferable to utilize an experimenter that was blind to the experimental hypotheses. Experimenter-expectancy effects are well documented (Sattler, Hillix and Neher, 1970; Badad, Mann and Mar-Hayim, 1975) and present a challenge to experimental designs that utilize procedures requiring specialized training (e.g. hypnosis). To minimize experimenter effects, tape recordings may be used to standardize procedures by presenting uniform instructions in either individual or group settings.

The hypnotic induction portion of the SHCS-C did not produce significant increases in suggestibility. Accordingly, it may be profitable for future researchers to use 'suggestibility scales' that do not require the use of hypnotic inductions. For example, the Creative Imagination Scale (CIS; Wilson and Barber, 1978) was developed to meet the needs for a nonauthoritarian scale that can be given with or without an induction.

Our results imply that the SHCS-C underestimates hypnotizability. With more difficult items on the scale, as Zeltzer and LeBaron (1984) included in their revision, some individuals may evidence greater change scores. It is recommended that future researchers use a suggestibility scale that includes a sufficient range to reveal potential increases in hypnotizability.

The present findings do not support the view that hypnosis produces a qualitatively distinct state of consciousness. As was reported in previous research with adults, the present study of children revealed that nonhypnotic suggestibility accounted for most of the variability in hypnotic responsiveness. Given the reliability of the suggestibility scale used, there is little additional variance left to explain. We found that a hypnotic induction increased the suggestibility of subjects who displayed a tendency to become easily absorbed in imaginative activities and reported vivid imagery skills. Accordingly, individual differences may well predict who will benefit from the administration of a hypnotic induction.

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This article is based on the doctoral dissertation completed by the first author.

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