SPECIAL FEATURE

Hypnosis as an Adjunct to Cognitive-Behavioral Psychotherapy: A Meta-Analysis

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A meta-analysis was performed on 18 studies in which a cognitive-behavioral therapy was compared with the same therapy supplemented by hypnosis. The results indicated that the addition of hypnosis substantially enhanced treatment outcome, so that the average client receiving cognitive-behavioral hypnotherapy showed greater improvement than at least 70% of clients receiving nonhypnotic treatment. Effects seemed particularly pronounced for treatments of obesity, especially at long-term follow-up, indicating that unlike those in nonhypnotic treatment, clients to whom hypnotic inductions had been administered continued to lose weight after treatment ended. These results were particularly striking because of the few procedural differences between the hypnotic and nonhypnotic treatments.

Once relegated to the realm of the supernatural, hypnosis is increasingly accepted as a legitimate therapeutic procedure (Rhue, Lynn, & Kirsch, 1993). A century ago, hypnotherapy often consisted of a hypnotic induction, followed by the administration of suggestions for symptom removal. Consequently, hypnotherapy has been viewed by some writers as a mode of therapy that might be compared with psychodynamic, cognitive–behavioral, or other therapeutic approaches (e.g., Smith, Glass, & Miller, 1980). However, suggestions for symptom relief play a relatively minor role in contemporary hypnotherapy. Instead, hypnotherapy generally consists of the addition of hypnosis to some recognized form of psychotherapy (Rhue et al., 1993). As a result, the question to be asked is not whether hypnosis works better than another treatment but rather whether it enhances the effectiveness of a treatment.

Before 1980, research on the efficacy of hypnotherapy was largely confined to psychodynamic hypnotherapy (Smith et al., 1980). More recently, empirical studies have focused on the use of hypnosis in behavior therapy, cognitive therapy, and cognitive–behavior therapy (Spinhoven, 1987). The distinction between these latter modes of therapy is not entirely clear. Cognitive processes (e.g., imagery) are a component of many behavior therapies, and behavioral tasks are a component of virtually all cognitive therapies. In this article, we use the term *cognitive-behavioral psychotherapy* to refer to treatment procedures described as behavioral, cognitive, or cognitive–behavioral.

Clinical hypnosis is a procedure in which a therapist suggests that a client experience changes in sensation, perception, thought, and behavior. The hypnotic context is established by an induction procedure that usually includes instructions for relaxation. Hypotheses about how this procedure might enhance therapy vary with theoretical conceptions of hypnosis. Most therapists believe that hypnotic inductions produce an altered state of consciousness in susceptible individuals (see Kirsch, 1993). Among the presumed characteristics of the hypothesized hypnotic state are hypersuggestibility, more vivid imagery, more primary process thinking, greater availability of childhood memories, and a tolerance of logical incongruities often referred to as "trance logic" (Fromm, 1992; Hilgard, 1965; Orne, 1959). From a traditional state perspective, the benefits of adding hypnosis to treatment are due to these characteristics of the hypothesized trance state.[1]

In contrast to this view, cognitive–behavioral theorists have rejected the hypothesis that there is a distinctly hypnotic state of consciousness (Barber, 1969; Kirsch, 1990; Sarbin & Coe, 1972; Spanos & Chaves, 1989). From a nonstate perspective, hypnosis has been hypothesized to augment therapy outcome through its effects on clients' beliefs and expectations (Barber, 1985; Coe, 1993; Fish, 1973; Kirsch, 1985, 1990). Thus, state theorists and cognitive-behavioral theorists agree that hypnosis can enhance treatment effects, albeit for different reasons. The purpose of this review is to assess the empirical data bearing on this question of whether cognitive-behavioral psychotherapies are enhanced by the addition of hypnosis.

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[1] Some hypnosis theorists use the terms *state* and *trance* in a purely descriptive sense, without ascribing any causal properties to the concept (Hilgard, 1969; Kihlstrom, 1985). With respect to the altered state issue, this view is virtually identical to the cognitive–behavioral conception of hypnosis.

There are a number of reasons for supposing that if hypnosis enhances psychotherapy outcome, its effects are likely to be relatively modest. First, most of the procedures conducted in hypnotherapy are the same as those conducted in nonhypnotic psychotherapy. This is a consequence of the fact that hypnosis is an adjunct to therapy rather than a mode of therapy. Second, clients vary in their responsiveness to hypnosis. From a traditional state viewpoint, only those with sufficient hypnotic talent or ability are likely to benefit substantially from the addition of hypnosis to a treatment (Levitt, 1993). Third, clients vary in their attitudes and expectancies regarding hypnosis. Enhancement of outcome should be limited to clients with positive attitudes and expectations, whereas a degradation of treatment outcome might be expected among clients with negative attitudes (Kirsch, 1990, 1993). Finally, typical hypnotic inductions closely resemble conventional relaxation training. In fact, all that is needed to convert relaxation training into a hypnotic induction is the addition of the word hypnosis. Instead of saying "more and more deeply relaxed," the therapist says "more and more deeply hypnotized." Because relaxation training is a frequent component of behavior therapy, the addition of hypnosis to behavior therapy may consist of little more that the use of the word "hypnosis."

The small magnitude of anticipated mean effects, combined with the relatively small samples used in many therapy outcome studies, are likely to lead to inconsistent outcomes, in which some studies show significant effects and others do not. In situations of this sort, meta-analyses can provide more definitive answers than individual studies, narrative reviews, or box scores of significant results (Hunter & Schmidt, 1990). Meta-analysis allows comparison of outcomes across studies by the calculation of effect sizes, defined as the standardized mean difference between the experimental group and the control group. The meta-analysis reported here assesses the effect of adding hypnosis to cognitive-behavioral psychotherapy. Because hypnosis is not a treatment in its own right, we limited our sample of studies to those in which a cognitive-behavioral treatment administered in a hypnotic context was compared to the same treatment administered without hypnosis. In calculating effect sizes, the nonhypnotic treatment was treated as the control condition.

Method

Studies of cognitive-behavioral hypnotherapy were obtained from previous reviews (Rhue et al., 1993; Spanos, 1991; Spinhoven, 1987) and a computer search of the PsycLIT database from 1974 to 1993 using the search terms, *cognitive–behavioral hypnotherapy, hypnosis and psychotherapy, hypnosis and behavior therapy,* and *hypnotherapy or hypnosis and adjunct to therapy.* Inclusion criteria were as follows: (a) A cognitive-behavioral psychotherapy was administered to at least one group of participants in a hypnotic context; (b) the same therapy was administered to at least one group of clients in a nonhypnotic context; and (c) sufficient data were reported to allow calculation of effect sizes.

These criteria resulted in a sample of 18 studies in which 20 hypnotic treatments were compared with identical nonhypnotic treatments and from which we were able to calculate the magnitude of 90 effects. These comparisons involved 577 participants. Fourteen treatment comparisons were derived from data of clinical patients as participants, 5 used college students as participants, and 1 involved a mix of clinical patients

and college students. Participants were assigned to treatment randomly in 16 of these comparisons and sequentially in 2 (Edelson & Fitzpatrick, 1989; Lazarus, 1973). Method of participant assignment was unclear in two of the reports (Howard & Reardon, 1986; O'Brien, Cooley, Ciotti, & Henninger, 1981).

Effect sizes (d) were calculated for each outcome variable as the standardized mean difference between the hypnosis group and the corresponding no-hypnosis group. Where sufficient data were not provided for direct calculation of effect sizes, they were estimated using the procedures described by Smith et al. (1980).

Three different units of analysis can be used in calculating mean effect sizes, individual dependent variables (e.g., Smith et al., 1980), treatments (e.g., Barker, Funk, & Houston, 1988), or studies (e.g., Lyons & Woods, 1991). In the latter two methods, effect sizes are averaged across dependent variables. Using individual dependent variables as the unit of analysis results in substantial violations of the assumption of statistical independence when standard inferential statistical tests are applied to the results. In contrast, statistical independence is assured when only one effect size is used from each study (Hunter & Schmidt, 1990).

Some studies contain evaluations of more than one treatment. In such cases, the use of a single effect size for each study obscures differences between these treatments. In the present sample, there were two studies in which more than one hypnotic treatment were compared with a comparable nonhypnotic treatment. Goldstein (1981) included two hypnosis groups, in one of which the participants were given an arm levitation suggestion as a means demonstrating the effects of hypnosis and thereby enhancing the participants' treatment outcome expectations. Barabasz and Spiegel (1989) also used two hypnosis groups, one in which the same hypnotic suggestions were used for all participants and another in which suggestions were individualized on the basis of participant characteristics.

Treatment was chosen as the unit of analysis in this meta-analysis because it avoids shortcomings associated with other options. Using studies as the unit of analysis would not have allowed complete assessment of variations in cognitive-behavioral hypnotherapy, thereby impeding the search for moderator variables. Using individual effects as the unit of analysis would have biased the results in the direction of studies with large numbers of dependent variables. Calculating a mean effect for each treatment avoided both of these shortcomings. Also, because there were only two studies in which more than one hypnotic treatment was included, the use of treatment as the unit of analysis affected statistical independence only minimally. As a further precaution, standard inferential statistics were replaced by the calculation of confidence intervals calculated as 1.96 times the standard deviation of the sampling error (i.e., 1.96 times the standard deviation of the observed effect sizes divided by the number of effects; Hunter & Schmidt, 1990, pp. 437–438).

Results

Presenting problems, treatments, sample sizes, and effect sizes are presented in Table 1. The mean effect size across studies was .87 standard deviations. This effect differed significantly from zero, indicating that hypnosis enhanced the efficacy of cognitive-behavioral treatments. Inspection of Table 1 reveals a wide range in sample size, which is a source of potential bias. Calculation of the correlation between sample size and effect size indicated that significantly larger effects were reported in studies with larger samples ($r = .50, p < .05$). To correct for this bias, we weighted effects by the size of the samples from which they were obtained and calculated the mean weighted effect size

Table 1
Description of Studies and Mean Effect Sizes

Study	Presenting problem	Cognitive–behavioral treatment	n	d
McAmmond et al. (1971)	Pain	Relaxation	18	−0.20
Borkovec & Fowles (1973)	Insomnia	Relaxation	18	−0.10
Deabler et al. (1973)	Hypertension	Relaxation	30	0.51
Lazarus (1973)	Mixed	Varied	20	1.45
Sullivan et al. (1974)	Anxiety	Relaxation	16	1.40
Graham et al. (1975)	Insomnia	Relaxation	22	−0.01
Bornstein & Devine (1980)	Obesity	Covert modeling	18	0.83
Deyoub & Wilkie (1980)	Obesity	Imagery + coping suggestions	48	−0.17
Goldstein (1981) (Hypnosis with arm levitation)	Obesity	Self-monitoring + stimulus control + self-reinforcement	40	5.57
Goldstein (1981) (hypnosis without arm levitation)	Obesity	Self-monitoring + stimulus control + self-reinforcement	40	−0.08
O'Brien et al. (1981)	Snake phobia	Systematic desensitization	18	0.73
Wadden & Flaxman (1981)	Obesity	Covert modeling	22	−0.22
Bolocofsky et al. (1985)	Obesity	Self-monitoring + goal setting + stimulus control	109	3.65
Howard & Reardon (1986)	Self-concept & athletic performance	Cognitive restructuring	16	0.02
Barabasz & Spiegel (1989 [standard suggestions])	Obesity	Self-monitoring + goal setting	30	0.62
Barabasz & Spiegel (1989 [individualized suggestions])	Obesity	Self-monitoring + goal setting	29	0.75
Edelson & Fitzpatrick (1989)	Chronic pain	Cognitive strategy	18	0.16
Tosi et al. (1989)	Duodenal ulcer	Cognitive restructuring	12	0.93
Tosi et al. (1992)	Hypertension	Cognitive restructuring	21	1.11
Schoenberger (1993)	Public speaking anxiety	Relaxation + imagery + cognitive restructuring + in vivo practice	32	0.40

(D) following the procedures described by Hunter and Schmidt (1990). This revealed a significant effect of 1.36 standard deviations resulting from the addition of hypnosis to cognitive-behavioral psychotherapy. This indicates that the average client receiving cognitive-behavioral hypnotherapy showed more improvement than 90% of clients receiving nonhypnotic treatment.[2]

Inspection of Table 1 reveals two effects that might be classified as outliers (Bolocofsky, Spinler, & Coulthard-Morris, 1985; Goldstein, 1981). To provide conservative estimates of effect sizes, we winsorized with $g = 1$ and $g = 2$, which resulted in weighted mean effect sizes of 1.23 and .66, respectively. The more conservative of these estimates indicates that the average client receiving therapy with hypnosis was better off at the end of it than 75% of clients receiving the same therapy without hypnosis.

Besides calculating overall effects, we examined effect size as a function of type of dependent variable. Physiological variables were assessed in 12 studies, behavioral measures in 5 studies, and self-report measures in 9 studies. Mean unweighted (d) and weighted (D) effect sizes for each category of dependent variable are reported in Table 2, along with the variances of the weighted estimates of the population effect sizes. Neither weighted nor unweighted effect sizes differed significantly as a function of type of measure, and each was significantly greater than zero.

Although the mean effect for the addition of hypnosis to cognitive-behavioral psychotherapy was significantly greater than zero, the variance of the overall population effect sizes and that of physiological measures were very large, indicating the pres-

ence of a moderator variable. Although the variances of population effect sizes suggested the presence of a moderator only for physiological outcomes, we were also interested in examining theoretically predicted potential moderators. Therefore, we began assessing possible moderating variables using the treatment effect sizes listed in Table 1.

The use of hypnosis in psychotherapy entails the provision of a hypnotic induction followed by therapeutic suggestions. Most hypnotic inductions (including all of those described in the studies reviewed here) contain relaxation instructions that are very similar to those used in relaxation training. In some of the studies reviewed here, the only difference between the hypnotic induction and the relaxation instructions used in the nonhypnotic condition was the use of the term *hypnosis* (e.g., Lazarus, 1973; Schoenberger, 1993). Because relaxation training was used in only some of the nonhypnotic cognitive-behavioral treatments described in this review, the enhancement of treatment outcome that we observed may have been due to relaxation instructions rather than to other aspects of hypnosis.

In many of the studies, suggestions other than those contained in the nonhypnotic treatment were included in the hypnotic treatment. As noted earlier, a hand levitation suggestion was included in one of the hypnotic conditions in the Goldstein (1981) study. Similarly, Schoenberger (1993) added brief direct suggestions for symptom improvement to her treatment when

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[2] Because of the exceptional magnitude of this effect, we recalculated the weighted effect using the procedure described by Hedges & Olkin (1985) for $d_+^{(1)}$. This yielded the same mean weighted effect as that obtained using the Hunter and Schmidt (1990) procedure.

Table 2
Population Effect Sizes as a Function of Type of Variable

Type of measure	n	d	D	Variation of D
Physiological	12	0.95	1.42	3.15
Behavioral	5	0.73	0.73	0.08
Self-report	9	0.60	0.58	0.10
Combined	20	0.87	1.36	2.94

it was conducted in a hypnotic context. Thus, a second potential moderating variable is the addition of suggestions not included in the nonhypnotic treatment.

Hypnosis may enhance the effectiveness of treatment for some problems but not for others. Wadden and Anderton (1982), for example, hypothesized that hypnosis might have special value in the treatment of "nonvoluntary" disorders (i.e., pain, warts, asthma) but not in the treatment of disorders of "self-initiated" behavior (i.e., obesity, cigarette smoking, alcoholism). Although a variety of presenting problems were treated in the studies we found, in most instances the number of studies per presenting problem was too small for meaningful comparison of effect sizes. However, obesity was the presenting problem in eight of the treatment comparisons under review, allowing a comparison of the effectiveness of adding hypnosis to the treatment obesity with that of adding it to the treatment of various other problems (e.g., pain, insomnia, hypertension, and anxiety).

Participants for half of the treatment comparisons were solicited by advertisements or from college student bodies. Those for the other comparisons consisted of patients who had sought or were referred for treatment. Patients seeking treatment might be more distressed and more motivated for change, and these characteristics might interact with type of treatment, leading to differential outcomes.

Finally, direct calculation of effect sizes from means and standard deviations was possible in only nine treatment comparisons. In the remaining 11, standard deviations were estimated using the methods described by Smith et al. (1980). It is possible that these indirect procedures produced effect sizes that were different from those produced by calculation from exact data.

The results of analyses of these potential moderating variables are displayed in Table 3. They indicate that hypnotic enhancement of therapeutic outcome is not due to the addition of relaxation instructions nor to the addition of therapeutic suggestions. Nature of the participant population also did not affect outcome. There was considerable variance in population effect sizes regardless of whether relaxation was included in the control treatment, whether additional therapeutic suggestions were added to the hypnotic treatment or whether the participants had sought treatment or were solicited. This indicates that none of these variables was the source of the variation in the estimated population effect sizes.

Estimation of standard deviations resulted in significantly greater effects than those calculated from studies in which the

standard deviations were reported, although both effect sizes differed significantly from zero. There was also substantial variation in estimated effect sizes, indicating that this methodological difference did not fully account for the observed lack of homogeneity in effect sizes. Similarly, the mean weighted effect size for treatments of obesity was more than triple that of treatments for other disorders, and both effect sizes differed significantly from zero. However, the variance in effect sizes in studies of obesity was so large that the difference was not statistically significant. In contrast, the variance in effect sizes for treatments of presenting problems other than obesity was negligible, and the variance in exactly calculated effect sizes was relatively low.

The data indicate that the as-yet undiscovered moderating variable affected only physiological variables and studies in which obesity was the focus of treatment. Also, it was more evident in estimated effect sizes than in exactly calculated effects. The pattern of overlap between these variables suggested to us that presenting problem was central to the as yet undiscovered moderating variable. The dependent variables of studies on obesity were limited to a single physiological measure (weight). Similarly, all but two of the effects for obesity were estimated. Our suspicion was confirmed by separate analyses of the six estimated obesity effects and the five estimated effects involving other presenting problems, which indicated inflated effect sizes and substantial variance for estimated obesity effects ($D = 2.53$, variance $= 4.27$), but not for estimated effects for other presenting problems ($D = .13$, variance $= .07$).

In a narrative review of the use of hypnosis in weight reduction treatments, Levitt (1993) noted that participants in one hypnotic treatment program (Bolocofsky et al., 1985) continued to lose weight over a 2-year period after the end of the program, whereas participants in nonhypnotic treatment did not. Examination of obesity studies in this meta-analysis revealed a wide range in the length of time during which follow-up data

Table 3
Population Effect Sizes as a Function of Hypothesized Moderators

| Potential moderator	No. of treatments in comparison	d	D	Variation in D
Relaxation				
In both treatments	11	0.77	1.51	2.21
In hypnotic treatment only	9	0.99	1.15	3.84
Suggestions				
Same in both treatments	14	0.63	1.20	2.21
More in hypnotic treatment	6	1.42	1.74	4.50
Presenting problem				
Obesity	8	1.37	1.96	4.14
Other	12	0.53	0.52	0.06
Participant population				
Sought or referred for treatment	10	1.24	1.42	3.19
Solicited	10	0.49	1.31	2.74
Effect calculation method				
Exact	9	0.62	0.47	0.20
Estimate	11	1.07	1.87	3.79
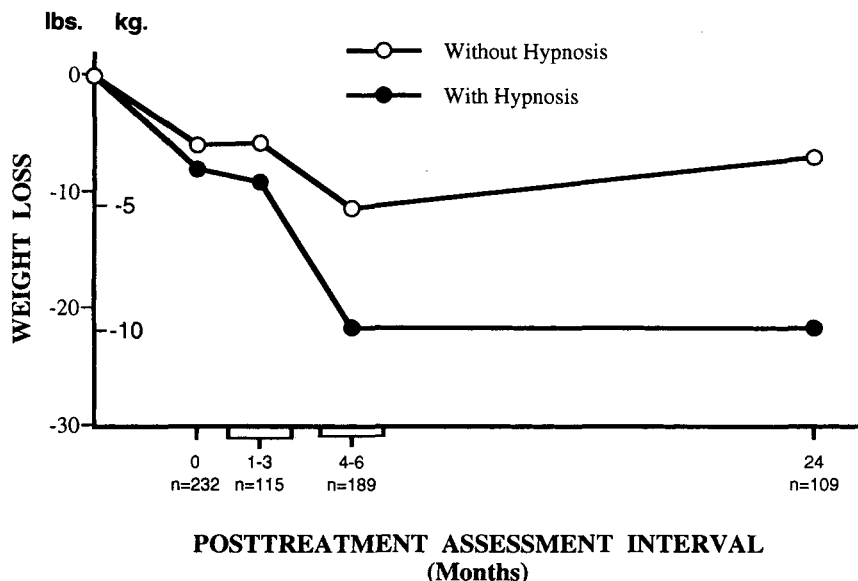
Figure 1.   Weight loss as a function of assessment interval and inclusion of hypnosis in treatment.

Discussion

were collected (2–24 months). To determine if effect size was influenced by duration of the follow-up period, we calculated the correlation between time of assessment and magnitude of effect, using individual assessments as the unit of analysis. This revealed that after treatment ended, the effect of hypnosis increased over time ($r = .59$, $p < .02$). Thus, the observed effect of adding hypnosis to treatments of obesity was moderated by the length of the follow-up assessment interval. The association between assessment interval and effect of treatment is graphically displayed in Figure 1. By using mean weight loss in place of effect size, the problems associated with estimating standard deviations are avoided and the clinical significance of the difference can be judged more accurately.

Discussion

The results of this meta-analysis indicates a fairly substantial effect as a result of adding hypnosis to cognitive-behavioral psychotherapies. Effect sizes were consistent for behavioral and self-report measures of change and for all measures of change in studies of presenting problems other than obesity. This indicates that hypnosis enhances the effects of cognitive-behavioral psychotherapy across a broad range of problems. Our most conservative estimates of this effect approximate 0.5 standard deviations, indicating that the average client receiving cognitive-behavioral hypnotherapy benefitted more than at least 70% of clients receiving the same treatment without hypnosis.

There are two factors that appear to account for the variance in physiological effects: presenting problem and length of follow-up. For problems other than obesity, the variance in weighted effect sizes was negligible, thus allowing clear interpretation. We found a reliable effect of just over one half standard deviation caused by the addition of hypnosis to these treatments. Weight reduction treatments showed even larger effects

that were due to the addition of hypnosis, although the exact magnitude of this effect is uncertain because of the failure to report standard deviations in most of the weight reduction studies. For the sake of future meta-analyses, we strongly advocate the reporting of exact means (or adjusted means, if pretreatment scores are available) and standard deviations as a precondition for publication of outcome studies.

In contrast to treatments of other presenting problems, the effect of adding hypnosis to cognitive-behavioral treatment of obesity did not become apparent until some time after treatment had ended. Differences between hypnotic and nonhypnotic treatment of obesity increased up to 6 months after treatment ended and remained intact at 2-year follow-up. Furthermore, this phenomenon was independent of the effect size estimation problem resulting from missing standard deviations. It should be noted, however, that long-term follow-up data were reported only for obesity studies. Therefore, at least two interpretations of these data are possible. First, it is possible that the effects of hypnosis are particularly pronounced in the treatment of obesity, which is largely due to the failure of nonhypnotic treatments to produce lasting change. Alternately, it is possible that the advantages of adding hypnosis to cognitive-behavioral treatment increases over time, regardless of presenting problem. Resolution of this issue will require studies with long-term follow-up data for problems other than obesity.

Many scholars maintain that if treatment effects are due to hypnosis, rather than a function of nonspecific variables, they ought to be correlated with hypnotizability. Unfortunately, few of the studies considered in this review reported correlations of outcome with hypnotizability scores. In any case, correlations between hypnotizability and treatment outcome do not provide much information about hypothesized causal mechanisms, regardless of whether hypnotizability is assessed before or after

treatment. If hypnotizability is assessed before treatment, the person's response to hypnosis should affect his or her outcome expectations for a "hypnotic" treatment. If hypnotizability is assessed after treatment, the effects of treatment could influence their subsequent responses to a test of hypnotizability (Council, Kirsch, & Grant, in press; Kirsch & Council, 1992). Thus, correlations between hypnotizability and treatment outcome might be indicators of expectancy effects, rather than effects of some special hypnotic process.[3]

In summary, the results of this meta-analysis indicate that hypnosis can be a useful adjunct to cognitive behavior therapy for a wide variety of problems, and it may be particularly effective in treating obesity. The data indicating that hypnosis promotes long-term weight loss is particularly important, given the finding that most obese individuals who lose weight in non-hypnotic treatments soon regain it (Stunkard, 1972). Research is needed to establish the range of treatments and conditions that can be enhanced by the addition of hypnosis and to investigate participant variables that might predict when hypnosis would be helpful and when it might be harmful. Nevertheless, the current data suggest that training in hypnosis should be included routinely as a part of training in cognitive-behavioral treatments.

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[3] Note that the variance in effect sizes is probably not related to differences in hypnotizability, because individual difference variables of this sort would be more likely to affect within-study variance than between-study variance.

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Correction to Frick et al. (1991)

The article "Academic Underachievement and the Disruptive Behavior Disorders," by Paul J. Frick, Randy W. Kamphaus, Benjamin B. Lahey, Rolf Loeber, Mary Anne G. Christ, Elizabeth L. Hart, and Lynne E. Tannenbaum (*Journal of Consulting and Clinical Psychology,* 1991, Vol. 59, No. 2, 289–294), contained an error.

On page 290, in the formula to calculate the discrepancy score between IQ and academic achievement, Step 3 should appear as follows:

3. Differences between achievement and full-scale intelligence were expressed in z-score units adjusting for the standard error of estimate. For example, reading discrepancy = $(Z^{READ} - r \cdot Z^{FSIQ})/SE^{R}$.