

A Behavior-Analytic Critique of Bandura's Self-Efficacy Theory

Anthony Biglan
Oregon Research Institute

A behavior-analytic critique of self-efficacy theory is presented. Self-efficacy theory asserts that efficacy expectations determine approach behavior and physiological arousal of phobics as well as numerous other clinically important behaviors. Evidence which is purported to support this assertion is reviewed. The evidence consists of correlations between self-efficacy ratings and other behaviors. Such response-response relationships do not unequivocally establish that one response causes another. A behavior-analytic alternative to self-efficacy theory explains these relationships in terms of environmental events. Correlations between self-efficacy rating behavior and other behavior may be due to the contingencies of reinforcement that establish a correspondence between such verbal predictions and the behavior to which they refer. Such a behavior-analytic account does not deny any of the empirical relationships presented in support of self-efficacy theory, but it points to environmental variables that could account for those relationships and that could be manipulated in the interest of developing more effective treatment procedures.

Key words: Self-efficacy expectations, correspondence, behavior analysis, rule-governed behavior, phobias, private events

This paper presents a critique of self-efficacy theory from a behavior-analytic standpoint. Such an account of the phenomena that self-efficacy theory addresses is appropriate for at least two reasons. First, the role the environment plays in determining behavior that is said to require cognitive explanations needs explicating. Self-efficacy theory is an exemplar of a class of behaviorally-based theories that explain behavior in terms of cognitive constructs and that explicitly deemphasize the role of the environment in determining behavior. The theory has been applied to diverse aspects of human behavior, including phobias (Bandura, 1982a), smoking cessation (Condiotte & Lichtenstein, 1981), smoking prevention (McAlister, Perry, & Maccoby, 1979), so-

cial skills (Kazdin, 1979), arithmetic skills (Bandura & Schunk, 1981), depression (Zeiss, Lewinsohn, & Munoz, 1979), and pain tolerance (Glasgow et al., 1982). Clearly, many investigators believe that the theory provides a useful account of human behavior. Such an approach has probably been preferred to behavior analysis because of the widely-held beliefs that behavior analysis does not encompass private behavior (Zettle & Hayes, 1982) and that it is impossible, in principle, to account for human behavior without cognitive constructs (Bandura, 1969, 1977a, 1977b). The present paper provides a counterargument to these beliefs by explicating the role of the environment in determining (a) the behaviors that self-efficacy expectations are said to explain, (b) the behaviors (both overt and private) that are said to constitute self-efficacy expectations, and (c) the correspondence between statements and ratings of expectation and subsequent behavior.

A second reason for the present paper is to develop further the behavior-analytic account of socially significant clinical behaviors. Behavior analysts have been disinclined to discuss complex human behavior unless they have empirical evidence in keeping with accepted methodological criteria (Marr, 1984). This

Preparation of this paper was supported in part by grants HD15825 and HD13409 from the National Institute of Child Health and Human Development, and CA38273 from the National Cancer Institute. The views expressed are those of the author and are not intended to reflect those of any of these agencies. The author would like to thank Donald Baer, Wesley Becker, James Coyne, Michael Dow, Hyman Hops, Edward Lichtenstein, and Scott McConnell for their helpful comments on earlier versions of the manuscript. Special thanks to Lisa James for her editorial assistance. Requests for reprints should be sent to Anthony Biglan, Oregon Research Institute, 1899 Willamette Street, Suite 2, Eugene, Oregon 97401.

disinclination is unfortunate because behavior analysis, when applied, has made important contributions to the amelioration of important problems (Kazdin, 1979). A behavior-analytic account of the treatment of complex human behavior could be similarly fruitful, yet in large part has not been undertaken.

The paper is divided into four sections. In the first, the self-efficacy construct is described. The second section reviews the evidence that has been presented in support of self-efficacy theory. In the third section, a behavior-analytic account of the same phenomena is presented. The paper concludes by discussing the importance of returning to an emphasis on the manipulation of environmental variables in clinical research.

THE SELF-EFFICACY CONSTRUCT

The concept of self-efficacy is designed to account for the effects of different modes of clinical treatment (Bandura, 1977a). Self-efficacy is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977a, p. 193). According to this view, any intervention shown to affect a target problem, such as phobic behavior, has its effects *because* it increases people's perceptions of self-efficacy. Efficacy expectations are said to determine subsequent behavior, both in terms of the initiation and the persistence of coping behavior (Bandura, 1977a). Self-efficacy influences a person's choice of activities and behavioral settings and "can affect coping efforts." Efficacy expectations "determine" how much effort and persistence people show. Self-efficacy, however, is not the sole determinant of behavior; the person must also have "appropriate skills and adequate incentives" (Bandura, 1977a).

The factors that are said to increase self-efficacy are precisely the ones that have been shown to affect outcome in clinical treatment research. Those factors include performance accomplishments such as those produced by participant modeling and in vivo desensitization. Vicarious experiences, in which the client

observes a live model or imagines a model, are said to increase efficacy expectations. Verbal persuasion, such as that involved in self-instruction and psychotherapy, also has some effect on self-efficacy. Finally, techniques that reduce emotional arousal are said to affect self-efficacy. These include imaginal or "symbolic" desensitization.

EVIDENCE RELEVANT TO SELF-EFFICACY THEORY

Congruence Between Self-Efficacy Ratings and Subsequent Behavior

The evidence most frequently offered in support of the causal status of self-efficacy is that self-efficacy ratings are related to subsequent behavior. Considerable evidence of this sort exists, although it is not as consistent or strong as has sometimes been asserted. Self-efficacy ratings have been shown to predict post-treatment approach behavior of phobics regardless of the treatment procedures that were used (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura et al., 1980); ratings have been shown to predict behavior, whether the assessments were done in the midst of treatment or at the end (Bandura & Adams, 1977); and the ratings predict behavior toward stimuli other than those for which treatment was conducted (Bandura et al., 1977). As for target behaviors, self-efficacy ratings have been shown to predict behavior for agoraphobics who were receiving treatment (Bandura et al., 1980), relapse among participants in smoking cessation programs (Baer, Holt, & Lichtenstein, 1986), the assertiveness of people receiving treatment (Kazdin, 1979), physical stamina (Weinberg, Yukelson, & Jackson, 1980), career choice (Betz & Hackett, 1981), and exercise (Bandura & Cervone, 1983).

A number of recent papers have cast doubt on the assertion that self-efficacy ratings are as highly or consistently related to subsequent behavior as initial reports suggested. Kirsch (1980; Kirsch & Wickless, 1983) has shown that the "microanalytic" method used to assess congruence between self-efficacy ratings

and subsequent behavior in many studies (e.g., Bandura & Adams, 1977; Bandura et al., 1977, 1980) produces spuriously high estimates of congruence. The method involves assessing the degree to which a subject's behavior on a behavioral avoidance test is consistent with the subject's indications of self-efficacy for engaging in those same behaviors. Kirsch (1980) points out that, since both of these scales are Guttman scales, subjects will typically have only one point on each scale at which they go from endorsing or completing the item to not endorsing or completing it. For example, people might say that their efficacy was high for completing the first 7 of 10 steps in an approach test, and they might actually complete 8 of those steps. The microanalytic technique involves examining the proportion of these items on which efficacy agrees with actual behavior. In the example given, the person would have a congruence of .90, since efficacy would agree for steps 1 through 7 (where the subjects both said they could do the steps and did them) and on steps 9 and 10 (where the subjects both said that they could not complete the items and failed to complete them). Item agreement is entirely a function of the point on each scale at which the person changes from endorsing or completing the item to not endorsing or completing the item. Assessing agreement on each of the points of the scale is superfluous and suggests greater congruence than is appropriate. Not surprisingly, studies using this method of assessing congruence have often yielded estimates of congruence of .80 or more (cf. Bandura & Adams, 1977). More appropriate correlational analyses typically account for 30% or less of the variance in subsequent performance. Thus, on empirical grounds alone, there are reasons to doubt the causal role of the self-efficacy construct.

The causal role of self-efficacy is also said to be shown by the fact that self-efficacy ratings are more highly related to subsequent behavior than are samples of previous behavior. For example, Bandura et al. (1980) found that agoraphobics' performance on a post-treatment

approach test was predicted better by self-efficacy ratings than by performance on an approach test during treatment. Similar results have been found in other studies (Bandura et al., 1977). Some recent studies, however, have failed to show such a relationship. Baer et al. (1986), for instance, found that self-efficacy ratings did not predict later smoking behavior when the variance associated with current smoking level was taken out. Lane and Borkovec (1984) found that changes in self-efficacy ratings predicted self-reported anxiety, but not physiological and behavioral measures.

The Relative Effectiveness of Treatments

Treatment procedures that differ in effectiveness also differ in the degree to which they affect self-efficacy ratings. This evidence has been offered in support of the causal role of self-efficacy. Bandura et al. (1977) showed that participant modeling produced higher self-efficacy ratings and more approach behavior than modeling, which in turn produced higher self-efficacy ratings and superior approach behavior than a no-treatment control. Bandura and Adams (1977) treated 10 highly phobic subjects with systematic desensitization, and then provided supplementary participant modeling to the nine subjects who had not been completely successful in the desensitization. The participant modeling boosted self-efficacy of these subjects and, at the same time, increased their approach behavior.

Self-Efficacy and Arousal

The value of the self-efficacy construct has also been advocated on the basis of evidence that purports to show that self-efficacy causes arousal (Bandura, 1982a). One type of evidence offered in support of this assertion is that ratings of self-efficacy correlate with ratings of anticipated fear and of fear during approach tests (cf. Bandura et al., 1980). This evidence has been criticized because no direct physiological measures of arousal were obtained. In response to this con-

cern, Bandura, Reese, and Adams (1982) assessed the correspondence between self-efficacy ratings and blood pressure and cardiac acceleration. They manipulated the strength of self-efficacy ratings for specific approach tasks through "enactive mastery." The ratings were associated with blood pressure and cardiac acceleration in anticipation and during performance of the approach tasks. When further treatment produced maximum ratings of self-efficacy strength for all tasks, physiological reactions to these tasks were reduced. In a similar study, Bandura et al. (1985) treated spider phobics with modeling until each subject had an approach task for which they rated their self-efficacy as being strong, a task for which they rated their self-efficacy as being moderate, and one for which they labeled their self-efficacy as being weak. Subjects' levels of epinephrine and norepinephrine during each approach task were predictable from these self-efficacy ratings.

A BEHAVIOR-ANALYTIC ALTERNATIVE

Response-Response Relationships and Causation

Evidence presented in favor of self-efficacy's causal status necessarily involves correlations between ratings of self-efficacy and other aspects of behavior, including physiological responses (Hayes & Brownstein, 1986; Moore, 1984a, 1984b). Some of the evidence appears to involve experimental manipulations of self-efficacy, however, and thus seems to escape the charge that the evidence is only correlational. For example, some studies manipulate self-efficacy levels through treatment and then assess the relationship between self-efficacy and overt behavior (cf. Bandura et al., 1982). Other studies appear to show that manipulations of self-efficacy ratings produce corresponding changes in rated physiological arousal (Bandura et al., 1982, 1985). In all these studies, a sequence of events is presented as follows: (a) self-efficacy ratings are experimentally manipulated through treatment; (b) when specific

strengths of self-efficacy are achieved for specific approach tasks, behavior or arousal is evaluated; (c) self-efficacy ratings are related to behavior or arousal. Changes in behavior and arousal are concluded to be due to changes in self-efficacy.

The attribution of the mediating role of self-efficacy is an arbitrary interpretation of this sequence of events. The sequence can alternatively be viewed as involving the effects of treatment manipulations on both self-efficacy ratings and other behavior. The relationship between self-efficacy ratings and other behavior is inevitably correlational, because both are responses of the same organism (Moore, 1984a, 1984b). Any procedure that affects self-efficacy is a procedure applied to the same organism that exhibits overt behavior and responds physiologically. Thus, when environmental variables are manipulated in order to affect self-efficacy ratings, the environment that affects these other aspects of behavior is also being manipulated.

Construing this sequence of events as a process whereby self-efficacy affects overt behavior or physiological arousal suggests a preference among self-efficacy theorists for the attribution of causal status to response variables. The preference among behavior analysts is to include in the account a description of the environmental variables that determine both types of responses and any relationships among them (Biglan & Kass, 1977; Moore, 1984a, 1984b; Skinner, 1953, 1945, 1974; Zettle & Hayes, 1982). Hayes and Brownstein (1986) have argued that neither view is inherently correct, but that the two approaches reflect different goals and different criteria for the truth of statements. The behavior-analytic view is a contextualist "world view" that emphasizes prediction and control as the criteria for the truth of statements in its system; explanation is considered to be achieved to the extent that statements lead to successful prediction and control. Self-efficacy theory reflects a world view that accepts as true statements that generate accurate predictions in situations other

than ones in which the statements were derived. A phenomenon is taken to be explained to the extent that it corresponds to a set of theoretical statements. Thus, self-efficacy and behavior-analytic approaches to response-response relationships may be seen as stemming from different world views.

Whether the behavior-analytic approach to such problems is ultimately preferable is a matter of how one evaluates prediction and control as criteria for the truth of statements. Hayes and Brownstein (1986) point out that the emphasis on prediction and control leads to the specification of environmental variables that account for all responses (whether verbal or nonverbal, private or observable) and for the relationships between responses. The following sections provide just such an account for the phenomena addressed by self-efficacy theory. It takes nothing away from the self-efficacy account, but it leads to the specification of variables outside the organism which can, at least in principle, be manipulated. The account is speculative. But, to the extent that it delineates external variables that affect both measures of the self-efficacy construct and behaviors that are correlated with self-efficacy measures, then it may lead to more effective clinical interventions.

Self-Efficacy and Verbal Behavior

Ratings, statements, and thoughts of self-efficacy may be seen as forms of verbal behavior in which people predict other behavior. Rather than assuming that such behavior reflects an underlying cause, behavior analysts see the environment as the critical factor in the determination of ratings, thoughts, and statements of efficacy, as well as overt verbal and nonverbal behavior and physiological responses. One type of response (e.g., a thought about one's efficacy) can function as a discriminative stimulus or a consequence of another type of behavior (e.g., approaching a snake), but such functional relationships are assumed to be a product of environmental events. Discriminative control is not assumed to

be exercised only by thoughts, statements, or ratings of self-efficacy; any organismic event can come to function as a discriminative stimulus or a reinforcer for another organismic event, provided that reinforcement follows the contingent occurrence of the two events, at least intermittently.

A response class of saying and doing. People experience numerous instances in which their statements about what they are doing, have done, or are about to do are followed by consequences. Typically, the consequences are based, at least in part, on the correspondence between the description of behavior and the actual behavior. For example, a person who promises to do something for a friend may be thanked or praised for making the promise, but praise may turn to disapproval if the promise is not subsequently fulfilled. Not all of the relevant consequences are social. People who can accurately predict how long it will take them to complete a task may be reinforced when the accuracy of their predictions allows them to plan their time efficiently and/or to avoid "having too little time" to finish a task. People also have a history of reinforcement for accurately reporting what they have done. Verbal descriptions of past behavior achieve reinforcements from others, such as attention and praise, and are reinforced when they facilitate the individual's later behavior, for example, when people remember where they left off on a task they worked on earlier. Inaccurate reports of past behavior are branded as lies and are otherwise punished.

What likely emerges from such a history is a response class of saying and doing in which verbal descriptions of behavior and the behavior described correspond closely with each other. The occurrence of a verbal description of behavior to occur in the future (e.g., promises and statements of intent) increases the probability of the subsequent behavior. By the same token, the occurrence of overt behavior makes it more likely that subsequent verbal descriptions of that behavior will occur (e.g., recollections). Evidence has been provided in a number of studies that this

type of correspondence is brought about by its consequences (Israel & Brown, 1977; Paniagua & Baer, 1982; Risley & Hart, 1968; Whitman et al., 1982). The involvement of such a process in much behavior in the natural environment is suggested by studies showing that, once correspondence is established, nonverbal behavior can be maintained by reinforcing reports of the behavior, even when those reports are sometimes inaccurate (Baer et al., 1984; Whitman et al., 1982).

The analysis of response classes of saying and doing is applicable to the behavior of people who fear specific objects. For these people, verbal statements about their phobic behavior are probably members of a response class of predictive statements and associated actions regarding the object. Subjects in self-efficacy experiments have had numerous experiences in which their descriptions and predictions of fearful behavior have been reinforced. People who say, "I can't go camping, I'm too afraid of snakes," avoid the aversive situation. If such reports are inconsistent with their past behavior, that inconsistency is likely to be pointed out in aversive ways. If they subsequently engage in behavior that is inconsistent with their stated fear, the inconsistency may be noted in ways that are aversive, and they may be expected to begin to do things that they have heretofore avoided. They may also achieve the more generalized reinforcement of "being right" when their avoidance behavior matches their predictions of fearful behavior (Hayes et al., 1985). Avoidance of phobic stimuli could reinforce predictive statements, even those statements that no one else heard. For example, the behavior of thinking about one's fear of bridges could be maintained if it led to a person avoiding crossing bridges.

Stimulus control of the response class. The stimuli that control this response class of predictions and nonverbal behavior appear to include external stimulus situations, such as the presence of a phobic stimulus and stimuli that have been paired with the phobic stimulus, private events such as physiological arousal and thoughts of the object, and

questions regarding likely future behavior. Thus, people's reports that they will be fearful on airplanes may be under the stimulus control of the verbal stimulus, "Why don't you fly to Arizona for the winter?" as well as the physiological arousal evoked by that stimulus.

When the controlling stimuli are accessible to others, the process by which such stimulus control is established and maintained can readily be imagined. A child cries and says, "I won't go in the yard," as a dog barks at him from behind a fence. Adults may reinforce both the verbal and the avoidance behavior by comforting the child and allowing him to avoid the dog. In this way, the presence of yards with big dogs is established as a controlling stimulus for verbal responses such as "I won't go in the yard," or "I'm afraid," and the corresponding nonverbal responses.

The processes by which private stimulation, such as a pounding heart, comes to control predictions of fearful behavior and associated behavior are more difficult to understand. Others do not have direct access to private events, yet when people report their fears they are to some extent responding to events that take place within them. Skinner (1945, 1957) has identified four processes through which private events such as a pounding heart or covert speech could come to be a discriminative stimulus for a verbal response, such as "I am anxious." First, others may observe public events that accompany the private event. In the example just given, the presence of the barking dog may accompany the physiological arousal that is occurring when the child says, "I'm afraid to go near that dog." Thus, when others reinforce the statement, "I can't go near that dog," they do so in the presence of physiological events. On future occasions, the arousal, by itself, may be a stimulus for the verbal response, "I can't do that." Second, others may reinforce verbal reports of fear on the basis of the observable behavior of the person. For example, if a child cries and cowers in the presence of the dog, the response, "I'm scared," will be reinforced on the basis of the observable be-

havior. In the future, this response may be more likely on occasions when only the private physiological events that originally accompanied the observable behavior are present. Third, people may come to respond to their own private stimulation through metaphorical extension of responses to observable stimuli. For example, people may describe themselves as "agitated" because their moving around a great deal resembles the condition of external stimuli in the presence of which the response "agitated" has been reinforced. The private stimulation that accompanies this moving around may then come to control the response. Fourth, and finally, people's descriptions of themselves may be under the stimulus control of their covert behavior, such as covert verbal statements. For example, people may say that they are fearful of airplanes in response to covert verbal statements, like, "The plane is going to crash." Such stimulus control is established when the people are reinforced for labelling themselves as fearful in the presence of overt verbal statements of the same type.

The temporal gap between controlling stimuli and predictions. One objection to the analysis presented here might be that the length of time between people's experiences with phobic objects and their subsequent predictions, and the length of time between predictions and subsequent behavior, make it necessary to posit a cognitive construct like self-efficacy. Bandura (1977b) has made such an argument with respect to imitative behavior: Cognitive processes are said to be required to account for the fact that modeled behavior can be imitated long after it has been observed. Deguchi (1984) has argued that there is no reason why gradual lengthening of the gap between the model and the imitation could not occur, such that reinforcement occurs after longer and longer delays. Descriptions of what a person will do may initially occur in the presence of the variables controlling the response and perhaps the incipient behavior. The temporal gap between the stimuli that control the prediction and the prediction could become longer, as

long as reinforcement were achieved. The idea that the time between predictions and later behavior could be lengthened is suggested by studies in which reports of behavior were shown to control behavior 22 hours later (cf. Risley & Hart, 1968).

Summary. From a behavior-analytic standpoint, self-efficacy ratings are thought of as one type of verbal behavior. Although subjects may not previously have been reinforced for making ratings of their self-efficacy, they have made numerous predictions about their phobic (and nonphobic) behavior, and the consequences of those predictions have established a response class that includes both the statements of what they will do with respect to the phobic object and what they actually do. Ratings and other predictive statements are probably under the stimulus control of both external stimuli and private events such as physiological responses, covert speech, and perceptual behavior. At the same time, the consequences for correspondence between verbal behavior about approach and avoidance of feared stimuli and the subsequent behavior make it likely that people will behave in a manner consistent with their predictions of approach or avoidance.

The Precision of Behavior Analysis

Behavior analysis makes it possible to be precise about when specific covert events are thought to have occurred. Biglan and Kass (1977) noted that cognitive constructs typically fail to distinguish between events that occur within the organism at a given time and place, and hypothetical constructs that go beyond an inference that an event has taken place. People may be said to have high self-efficacy for springboard diving, either because they report thinking things like, "I can do a jack-knife," or because they are seen to perform such a dive. A concept such as self-efficacy may be appealing in part because people think specifically from time to time that they can do things. If people typically behave without engaging in any covert verbal behavior, it goes unnoticed. Distinguishing between

instances when such thoughts occur and when they do not reduces the tendency to assume that all behavior can be understood as resulting from such cognitions.

Behavior analysis distinguishes among ratings of self-efficacy, covert verbal statements about self-efficacy, and overt verbal statements about self-efficacy. When people rate themselves as high in self-efficacy, they may or may not be reporting on specific verbal behavior in which they have engaged regarding their efficacy. For example, people who rate themselves as unable to touch a snake may or may not actually think to themselves that they will be unable to touch the snake at some point prior to making the rating.

These distinctions are important for at least two reasons. First, they may prompt greater precision in both theory and research about when ratings are actually under the stimulus control of covert and overt verbal behavior. Such precision could improve our ability to change important aspects of clients' verbal behavior. Second, clarification that self-efficacy ratings are not necessarily under the stimulus control of verbal statements points to the control that other events such as physiological responses and environmental events have over these ratings. Bringing these events into the account makes it more likely that they will be used in efforts to change self-efficacy ratings and, more importantly, to change avoidance behavior.

Reinterpretation of the Evidence for Self-Efficacy Theory

Correspondence between efficacy ratings and later behavior. From a behavior-analytic standpoint, the correspondence between self-efficacy ratings and later approach behavior is due to the contingencies that have placed a client's predictions about phobic behavior and actual phobic behavior into the same response class. Such correspondence does not indicate that the ratings play a causal role, or that an underlying causal entity is assessed by the ratings. People who touch snakes during participant modeling will

be more likely to say that they will touch snakes in the future, and will be more likely to touch them to the extent that they are reinforced by events such as lowered arousal and feedback from the therapist that they have succeeded. The contingencies involved in treatment modify both types of behavior.

The fact that, for phobic behavior, self-efficacy ratings have sometimes been found to predict later approach behavior better than prior behavior should not be surprising. Both ratings and later behavior are functions of the consequences of prior behavior; they are not simply functions of the prior behavior. Thus, several clients might engage in exactly the same approach behavior, but have different consequences for that behavior. For example, one might become physiologically aroused and another might not become aroused.¹ This difference in consequences would be expected to produce differing levels of both self-efficacy ratings and of subsequent approach behavior. Under these circumstances, self-efficacy ratings would be more highly correlated with later approach behavior than would prior approach behavior, but that correlation would not imply that self-efficacy determines later behavior.

Although physiological arousal is not the only consequence of approach behavior, it may be important when accounting for the fact that self-efficacy ratings predict subsequent approach behavior better than does prior approach behavior. In some studies, approach behavior was uniformly high across subjects at the end of treatment, but variability in self-efficacy ratings remained and the ratings were correlated with performance on a subsequent approach test (e.g., Bandura et al., 1977). Variability in arousal, however, may have remained. Unfortunately, arousal was not assessed. Such differences in arousal could have functioned as controlling stimuli for self-efficacy ratings and as consequences that affected later approach behavior. Thus, subjects who picked up the snake and were aroused would presumably be less likely to engage in such approach behavior in the subsequent test, and less likely

to indicate that they felt efficacious, than would those who picked up the snake and did not become aroused.

In studies where congruence was found, subjects reported no arousal to imagined phobic stimuli (although here, too, arousal was not directly assessed) (e.g., Bandura & Adams, 1977). In these studies, variability among subjects in past approach behavior and the consequences of that behavior presumably remained, since the approach behavior of these subjects was not directly modified during treatment. This remaining variability in the contingencies could account for the variability in both self-efficacy ratings and later approach behavior. In sum, while self-efficacy ratings have been shown to covary with subsequent behavior in a variety of circumstances, uncontrolled variables probably account for the variability in both ratings and in later behavior. Thus, although the data are consistent with the assertion that self-efficacy plays a causal role, they by no means entail that conclusion.

Self-efficacy ratings as controlling stimuli for later behavior. A number of writers have argued that the act of making a rating affects subsequent behavior (Borkovec, 1978; Eysenck, 1978; Kazdin, 1979; Lang, 1978), although none has discussed the relationship in terms of stimulus control. A series of studies have purported to show that making ratings does not affect subsequent behavior. Bandura et al. (1980), for instance, randomly assigned six of twelve subjects to a condition in which self-efficacy ratings were not made. Because the mean performance of these subjects did not differ from that for six subjects who did rate their self-efficacy, the authors concluded that making self-efficacy ratings does not affect subsequent behavior. The study is irrelevant to the present issue. Evaluating the effects of making ratings on the mean behavior of subjects has nothing to do with congruence. Having made self-efficacy ratings—on whatever level—the individual will be more likely to perform close to that predicted level due to past social consequences for such correspondence. This does not imply that making

self-efficacy ratings necessarily raises subjects' subsequent performance—or lowers it. It only implies that, having made a rating, the subject will tend to behave in a manner consistent with that rating.

Telch et al. (1982) purported to test whether “social demand for consistency” affects the congruence between self-efficacy ratings and approach test performance. In a low demand condition, subjects were led to believe that their self-efficacy ratings would not be seen by the experimenter, while in a high demand condition, subjects were told that their ratings would be reviewed and that the “ratings would be used to validate progress in the mastery of fears” (Telch et al., 1982). Prior to treatment, the congruence between self-efficacy and performance was significantly higher for the low-demand condition than it was for the high-demand condition. Following treatment, congruence was similarly high in both conditions, and had apparently increased since pretreatment. The authors concluded that the congruence between self-efficacy and performance could not be due to social demand for consistency, since the high-demand condition actually produced lower congruence at the outset.

This study is not relevant to evaluating the hypothesis that the act of making a rating is a controlling stimulus for later behavior. It did not really manipulate social demands for consistency. The manipulation of a social demand for consistency might have been achieved if some subjects had been told something like:

Self-efficacy ratings turn out to be surprisingly poor predictors of how you will perform. We are asking you to fill this out to demonstrate to you how inaccurate your beliefs about your performance capabilities are.

Under these circumstances, subjects might have lower congruence between ratings and subsequent approach behavior because of the implication that reinforcement would not be contingent on their acting in correspondence with what they had said. The Telch et al. (1982) study manipulated the salience of the ratings as an evaluation of the subjects.

Those in the high-demand condition were told that their ratings would be used to "evaluate progress." Subjects' motivation to show progress in their ratings was thus enhanced. The lower congruence at pretreatment for this group was probably due to subjects' systematically underestimating their approach behavior to meet the demand to show "progress." Telch et al. (1982) indicated that subjects in this condition did indeed underestimate their ability to perform compared to other subjects—a result that was not predicted by the authors.

Telch et al. (1982) argued that, if self-efficacy ratings predict behavior even when the ratings are made in private (their low-demand condition), then the act of making the rating could not affect subsequent behavior. At first blush, that argument appears consistent with the findings of Hayes and his colleagues, who have shown that, for a variety of therapeutic procedures, the instructions, models, or coping statements given to subjects are effective only when subjects are aware that the therapist has access to these events (Hayes et al., 1985; Nelson et al., 1983; Rosenfarb & Hayes, 1984; Zettle & Hayes, 1983). If differential consequences occur for correspondence between predictions about behavior and later behavior, some congruence between self-efficacy ratings and later behavior can be expected, even when ratings are made in complete privacy. Congruence should be higher when others have access to some members of the response class of predictive behavior. Thus, a person's interactions with a therapist during treatment would be expected to raise congruence, since treatment consists of instances where the person is instructed to engage in various approach behaviors, agrees to do so, engages in the behavior, and is reinforced. This treatment sequence would account for why congruence in the Telch et al. (1982) study is higher after treatment than before—even when the self-efficacy ratings are made in private on both occasions: Treatment strengthened the correspondence between predictions and actual behavior.

Further support for this position is

provided by the study by Bandura and Cervone (1983), in which subjects in the control condition received no feedback regarding their performance and did not set goals. These subjects were not exposed to contingencies for matching their self-efficacy ratings (or any other predictive statements) with their behavior. In addition, the task was sufficiently ambiguous to make it unlikely that experience with the task itself could have enhanced the match between predictions and behavior. Under these conditions, self-efficacy ratings did not correspond to subsequent behavior.

Gauthier and Ladouceur (1981) compared congruence between self-efficacy ratings and approach behavior between a group of subjects who completed the ratings privately and a group of subjects who publicly stated their ratings to the assessor. Congruence did not differ between the groups. In this case, "private" apparently meant filling the ratings out and leaving them for the assessor. The act of making the rating may not have been effectively private, since subjects could presumably discern that their ratings would be seen by the experimenter. Under these circumstances, the very act of indicating a particular level of efficacy is a discriminative stimulus for later behavior. (These authors also claimed that the fact that the two groups did not differ in mean performance undermined the hypothesis that making ratings affects later performance. As discussed above, mean group differences would not be expected.)

Relative effectiveness of treatments. From a behavior-analytic standpoint, the relative effectiveness of different treatments is not due to their relative effect on the self-efficacy construct, but to their relative effect on arousal and approach behavior. Participant modeling is more effective than desensitization in modifying approach behavior because subjects actually practice the approach behaviors that they will be asked to perform at post-treatment assessment. Imaginal desensitization has a smaller effect on approach behavior than does modeling because subjects only imagine approach

responses and do not practice them. Improvements in the subsequent approach behavior of subjects who received desensitization are likely due to a reduction in arousal and perhaps the covert approach rehearsal. Because arousal during imagination is probably one consequence that affects later approach behavior, its reduction increases the probability of approach behavior. Desensitization may also increase the probability of approach behavior if people have a history of being reinforced for imagining their behavior and then performing accordingly. Neither reducing arousal nor imagining effective performance, however, are as powerful in modifying approach behavior as actual practice of the behavior. Thus, these treatments differ in effectiveness because they differ in the degree to which they modify targeted behavior.

Self-efficacy theorists take the correlation between change in self-efficacy and change in approach behavior as evidence that changes in the self-efficacy construct lead to changes in approach behavior. From the standpoint of behavior analysis, changes in self-efficacy ratings simply reflect changes in this form of verbal behavior, not some underlying cause of all phobic behavior. Why are changes in the ratings related to changes in behavior? The answer: Because changes in self-efficacy ratings are also effects of the changes in arousal and approach behavior that are produced by these treatments. Since self-efficacy ratings are partly under the stimulus control of approach behavior and arousal, treatments that directly affect approach behavior and arousal, such as participant modeling, have a greater effect on self-efficacy ratings than do other treatments. This set of results does not demonstrate that treatment effects occur because treatment affects self-efficacy—it simply demonstrates that self-efficacy ratings are affected by these treatments in a manner similar to the way that the treatments affect approach behavior.

Self-efficacy and arousal. The correlation of self-efficacy ratings with measures of arousal does not demonstrate that self-efficacy causes arousal, any more than self-efficacy's correlation with overt be-

havior entails that it determine overt behavior. It simply shows that people's verbal predictions of what they can do are related to their arousal. From a behavior-analytic view, this correspondence is probably due to two factors.

First, both self-efficacy and subsequent arousal are functions of prior experience with the phobic stimulus. The arousal a person experiences would be expected to be correlated with the arousal they experienced on previous exposures to the phobic stimulus. Moreover, the arousal experienced during the previous exposure is one controlling stimulus for subjects' self-efficacy ratings. Thus, one reason why self-efficacy ratings are correlated with later arousal is that both self-efficacy ratings and the later arousal ratings are related to the arousal that was experienced on the previous occasion when the person was in the presence of the phobic stimulus.

Second, people's history of reinforcement for correspondence between predictions and later behavior make it likely that arousal ratings (and perhaps actual arousal) will correspond to their efficacy ratings. That is, after people have indicated that their efficacy expectations were at any given level, later arousal would tend to be in line with those expectations because of people's extensive history of reinforcement for having predictions of their own behavior conform to later behavior. People who are phobic have presumably had numerous experiences where they said that they would be anxious if they did something. Failure to be anxious in the relevant circumstances would prompt others to question them in aversive ways.

THE ROLE OF THE ENVIRONMENT

Deemphasis of the Environment in Self-Efficacy Theory

To some, self-efficacy theory may be attractive precisely because it deemphasizes the environment. According to Bandura (1977b), the environmental control of behavior has been overem-

phasized and cognitive determinants have been underemphasized:

A valid criticism of extreme behaviorism is that, in a rigorous effort to avoid spurious inner causes, it has neglected determinants of behavior arising from cognitive functioning. (1977b, p. 40)

The third distinctive feature of social learning theory is the central role it assigns to self-regulatory processes. People are not simply reactors to external influences. They select, organize, and transform the stimuli that impinge upon them. (Bandura, 1977b, p. vii)

Bandura's (1977a) original statement of the self-efficacy construct was prefaced by a "... reconceptualization of human learning and motivation in terms of cognitive processes" (p. 193). The effects of models, reinforcements, and instructions are seen as cognitively mediated. Thus, the construct is advocated in part because it focuses attention on cognitive determinants of behavior.

Research conducted to test self-efficacy theory illustrates the shift of investigators' attention away from environmental determinants of behavior. In the studies by Bandura and his colleagues on phobic behavior, the effects of previously validated interventions on self-efficacy ratings have been tested, and the ability of these ratings to predict subsequent behavior have been examined. The focus has been on the self-efficacy construct. These studies replicated earlier work regarding which treatment procedures affect phobic behavior, but they have tested no new ways in which the environment that therapists provide to phobics can affect phobic behavior. Moreover, other investigators who have tested self-efficacy theory have not identified or tested new ways in which therapeutic procedures might affect clinical problems. A number of tests of self-efficacy as a predictor of smoking relapse have been conducted (Baer et al., 1986; Conditte & Lichtenstein, 1981; DiClemente, 1981), but no treatments uniquely derived from self-efficacy theory have been proposed. Replication of the treatment of phobias using cognitive restructuring and guided exposure, where the central focus is on correlations between self-efficacy ratings and performance, have been evaluated

(Biran & Wilson, 1981). A good deal of research has been conducted regarding the effects of conditions under which self-efficacy ratings are made on subsequent performance (Bandura et al., 1980; Gauthier & Ladouceur, 1981; Telch et al., 1982). In essence, the theory has prompted investigators to show that already-validated treatments are related to self-efficacy, which is in turn related to post-treatment behavior. Rather than promoting new ways of changing clients' environments, the theory has directed attention toward providing post hoc accounts of why previously validated treatment procedures are effective. The procedures themselves were derived without benefit of self-efficacy theory.

The Importance of the Environment

A focus on the effects of the environment on behavior is critical. One can easily lose sight of the extraordinary growth of our knowledge about human behavior in the past twenty years. This growth is due to the examination of the way in which environmental manipulations affect behavior. In clinical psychology and psychiatry, treatment programs have been developed that beneficially affect simple phobias (Rachman, 1978), agoraphobia (Gelder & Marks, 1966), depression (Biglan & Dow, 1981), exhibitionism (Maletsky, 1980), stuttering (Brady, 1971), social skills (Curran, 1977; Hersen & Bellack, 1976), sexual dysfunction (LoPiccolo & LoPiccolo, 1978), and marital discord (Jacobson & Margolin, 1979). For children, programs have been identified that affect aggressive behavior (Patterson, 1982), social isolation (Hops, 1982), and bedwetting (Christopherson & Rapoff, 1980). Mentally retarded people are being taught to live independently (Shalock & Harper, 1978). Educational programs have been developed that achieve greater improvements in intellectual skills and in reading, mathematics, and language among disadvantaged children than was possible twenty years ago (Becker & Carmine, 1980).

A conclusive demonstration that these developments were due to a shift away

from construct-oriented approaches and toward analysis of the effects of the environment is not possible. Concurrent with the development of more effective interventions, however, was a good deal of critical examination of earlier attempts to explain behavior in terms of personality constructs (Mischel, 1968). Theoretical analysis of environment-behavior relations received increasing attention at the same time that practical progress was being made (Kazdin, 1978b). Whatever the theoretical analyses may have been that prompted these developments, treatment programs in the areas enumerated above involve the specification of particular behavioral targets (including private events) and the manipulation of the environment. Even when the effects of the intervention are presumed to be cognitively mediated, the treatment itself still consists of alterations of the person's environment (e.g., discussions and instruction).

THE AS YET UNFULFILLED PROMISE OF BEHAVIOR ANALYSIS

A theoretical approach like behavior analysis is an essential step in shifting attention back to developing more effective treatments. The approach explicates how presumed cognitive mediators are affected by the environment, and how their effect on other aspects of behavior derives from the environment. Thus, the approach demonstrates that it is possible to examine how the environment affects all aspects of the behavior of people with clinical problems—including their mentation (Biglan & Kass, 1977). If the analysis is correct, it is only through the environment that self-efficacy ratings and important clinical targets can be changed.

Up to this point, the contributions of behavior analysis to the understanding of complex human behaviors such as depression and phobias have been limited. A number of behavior analysts have noted that the approach has not fulfilled its promise (Skinner, 1953, 1957, 1969, 1974) to increase the understanding and control of important human behaviors

(Hops, 1985; Marr, 1984; Michael, 1984; Zettle & Hayes, 1982). Behavior analysts have, however, begun to address clinical issues. For example, a series of studies by Hayes and his colleagues shows that a variety of procedures often considered to be examples of self-generated or cognitive control of behavior owe their effects to the social environment (Hayes et al., 1985; Nelson et al., 1983; Rosenfarb & Hayes, 1984; Zettle & Hayes, 1983). At the same time, therapies that are said to be cognitive have been explained in terms of rule-governed behavior (Zettle & Hayes, 1982). Most important, new methods of treatment have been derived based on analyses of rule-governed behavior relevant to emotions and the contingencies controlling rule governance (Hayes, *in press*).

The present paper is in keeping with these developments. If the analysis presented here has provided a plausible account of self-efficacy findings in behavior-analytic terms, it may serve as a counter-argument to the prevailing emphasis on response-response relationships. More effective methods of treating clinical problems will be achieved when we have a clearer account of the ways in which all behavior—public or private, and motor, physiological, or verbal—is affected by the environment.

NOTES

1. Recent discussion by Hayes (*in press*) on the role of anxiety in avoidance behavior suggests that treatments for anxiety disorders may have two different effects. They may lower arousal and they may change the stimulus control that arousal has over overt behavior. Thus, people may become more willing to approach feared objects for two distinct, but not mutually exclusive reasons: (a) they experience less physiological arousal in the presence of the object and are thus not stimulated to avoid it and (b) they experience arousal but, due to the treatment contingencies to which they have been exposed, become willing to approach the object because the stimulus control of arousal over avoidance behavior has been weakened. Hayes (*in press*) argues that most current treatments of fears tend to emphasize the former mechanism. He proposes an approach in which the latter mechanism is emphasized. If he is correct, one would predict that both self-efficacy ratings and approach behavior could be increased without reducing arousal.

REFERENCES

- Baer, J. S., Holt, C. S., & Lichtenstein, E. (1986). Self-efficacy and smoking re-examined: Construct validity and clinical utility. *Journal of Consulting and Clinical Psychology, 54*, 846-852.
- Baer, R. A., Williams, J. A., Osnes, P. G., & Stokes, T. F. (1984). Delayed reinforcement as an indiscriminable contingency in verbal/nonverbal correspondence training. *Journal of Applied Behavior Analysis, 17*, 429-440.
- Bandura, A. (1969). *Principles of behavior modification*. New York: Holt, Rinehart, & Winston.
- Bandura, A. (1977a). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.
- Bandura, A. (1977b). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1982a). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122-147.
- Bandura, A. (1982b). The assessment and predictive generality of self-percepts of efficacy. *Journal of Behavioral Therapy and Experimental Psychology, 13*, 195-199.
- Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research, 1*, 287-310.
- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology, 35*, 125-139.
- Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research, 4*, 39-66.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*, 1017-1028.
- Bandura, A., Reese, L., & Adams, N. E. (1982). Micro-analysis of action and fear arousal as a function of differential levels of perceived self-efficacy. *Journal of Personality and Social Psychology, 43*, 5-21.
- Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*, 586-598.
- Bandura, A., Taylor, C. B., Williams, S. L., Meford, I. N., & Barchas, J. D. (1985). Catecholamine secretion as a function of perceived coping self-efficacy. *Journal of Consulting and Clinical Psychology, 53*, 406-414.
- Becker, W. C., & Carmine, D. (1980). Direct instruction: An effective approach to educational intervention with the disadvantaged and low performers. In B. B. Lahey & A. E. Kazdin (Eds.), *Advances in clinical child psychology* (Vol. 2, pp. 429-473). New York: Plenum.
- Betz, N. E., & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college men and women. *Journal of Counseling Psychology, 28*, 399-410.
- Biglan, A., & Dow, M. G. (1981). Toward a second-generation model: A problem-specific approach. In L. P. Rehm (Ed.), *Behavior therapy for depression* (pp. 97-121). New York: Academic.
- Biglan, A., & Kass, D. J. (1977). The empirical nature of behavior therapies. *Behaviorism, 5*, 1-15.
- Biran, M., & Wilson, G. T. (1981). Treatment of phobic disorders using cognitive and exposure methods: A self-efficacy analysis. *Journal of Consulting and Clinical Psychology, 49*, 886-899.
- Borkovec, T. D. (1978). Self-efficacy: Cause or reflection of behavioral change? *Advances in Behaviour Research and Therapy, 1*, 163-170.
- Brady, J. P. (1971). Metronome-conditioned speech retraining for stuttering. *Behavior Therapy, 2*, 129-150.
- Christopherson, E. R., & Rapoff, M. A. (1980). Pediatric psychology: An appraisal. In B. B. Lahey & A. E. Kazdin (Eds.), *Advances in clinical child psychology* (Vol. 3, pp. 311-329). New York: Plenum.
- Condiotte, M. M., & Lichtenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. *Journal of Consulting and Clinical Psychology, 49*, 648-658.
- Curran, J. P. (1977). Skills training as an approach to the treatment of heterosexual-social anxiety: A review. *Psychological Bulletin, 84*, 140-157.
- Deguchi, H. (1984). Observational learning from a radical-behavioristic viewpoint. *The Behavior Analyst, 7*, 83-95.
- DiClemente, C. C. (1981). Self-efficacy and smoking cessation maintenance: A preliminary report. *Cognitive Therapy and Research, 5*, 175-187.
- Eysenck, H. J. (1978). Expectations as causal elements in behavioral change. *Advances in Behaviour Research and Therapy, 1*, 171-175.
- Gauthier, J., & Ladouceur, R. (1981). The influence of self-efficacy reports on performance. *Behavior Therapy, 12*, 436-439.
- Gelder, M., & Marks, I. M. (1966). Severe agoraphobia: A controlled prospective trial of behavior therapy. *British Journal of Psychiatry, 112*, 309-319.
- Glasgow, R. E., Klepac, R. K., Dowling, J., & Rokke, P. D. (1984). *Extensions of self-efficacy: Predicting pain tolerance*. Unpublished manuscript, University of North Dakota: Williston, ND.
- Hayes, S. C. (in press). A contextual approach to therapeutic change. In N. Jacobson (Ed.), *Cognitive and behavior therapies in clinical practice*. New York: Guilford.
- Hayes, S. C., & Brownstein, A. J. (1986). Mentalism, behavior-behavior relations, and a behavior-analytic view of the purposes of science. *The Behavior Analyst, 9*, 175-190.
- Hayes, S. C., Brownstein, A. J., Zettle, R. D., Rosenfarb, I., & Korn, Z. (1986). Rule-governed behavior and sensitivity to changing consequences of responding. *Journal of the Experimental Analysis of Behavior, 45*, 237-256.
- Hayes, S. C., Rosenfarb, I., Wulfert, E., Munt, E. D., Korn, Z., & Zettle, R. D. (1985). Self-reinforcement effects: An artifact of social standard

- settings? *Journal of Applied Behavior Analysis*, 18, 201-214.
- Hersen, M., & Bellack, A. S. (1976). Social skills training for chronic psychiatric patients: Rationale, research findings, and future directions. *Comprehensive Psychiatry*, 17, 559-580.
- Hops, H. (1982). Social skills training for socially withdrawn/isolated children. In P. Karoly & J. Steffen (Eds.), *Enhancing children's competencies*. Lexington, MA: Lexington Books.
- Hops, H. (1985). [A review of *Marital interaction: Analysis and modification*]. *The Behavior Analyst*, 8, 235-246.
- Israel, A. C., & Brown, M. S. (1977). Correspondence training, prior verbal training, and control of nonverbal behavior via control of verbal behavior. *Journal of Applied Behavior Analysis*, 10, 333-338.
- Jacobson, N. S., & Margolin, G. (1979). *Marital therapy: Strategies based on social learning and behavior exchange principles*. New York: Brunner/Mazel.
- Kazdin, A. E. (1978). *History of behavior modification: Experimental foundations of contemporary research*. Baltimore: University Park Press.
- Kazdin, A. E. (1979). Sociopsychological factors in psychopathology. In A. S. Bellack & M. Hersen (Eds.), *Research and practice in social skills training* (pp. 41-74). New York: Plenum.
- Kirsch, I. (1980). "Microanalytic" analyses of efficacy expectations as predictors of performance. *Cognitive Therapy and Research*, 4, 259-262.
- Kirsch, I., & Wickless, C. V. (1983). Concordance rates between self-efficacy and approach behavior are redundant. *Cognitive Therapy and Research*, 7, 179-188.
- Lane, T. W., & Borkovec, T. D. (1984). The influence of the therapeutic expectancy/demand on self-efficacy ratings. *Cognitive Therapy and Research*, 8, 95-106.
- Lang, P. J. (1978). Self-efficacy theory: Thoughts on cognition and unification. *Advances in Behaviour Research and Therapy*, 1, 187-192.
- LoPiccolo, J., & LoPiccolo, L. (1978). *Handbook of sex therapy*. New York: Plenum.
- Maletzky, B. M. (1980). Assisted covert sensitization. In D. J. Cox & R. J. Daitzman (Eds.), *Exhibitionism: Description, assessment, and treatment* (pp. 187-251). New York: Garland.
- Marr, J. (1984). Conceptual approaches and issues. *Journal of the Experimental Analysis of Behavior*, 42, 353-362.
- McAlister, A., Perry, C., & Maccoby, N. (1979). Adolescent smoking: Onset and prevention. *Pediatrics*, 63, 650-658.
- Michael, J. (1984). Verbal behavior. *Journal of the Experimental Analysis of Behavior*, 42, 363-376.
- Mischel, W. (1968). *Traits and states as constructs*. New York: Wiley.
- Moore, J. (1984a). On behaviorism, knowledge, and causal explanation. *The Psychological Record*, 34, 73-97.
- Moore, J. (1984b). On privacy, causes, and contingencies. *The Behavior Analyst*, 7, 3-16.
- Nelson, R. O., Hayes, S. C., Spong, R. T., Jarrett, R. B., & McKnight, D. L. (1983). Self-reinforcement: Appealing misnomer or effective mechanism? *Behavioral Research and Therapy*, 21, 557-566.
- Paniagua, F. A., & Baer, D. M. (1982). The analysis of correspondence training as a chain reinforceable at any point. *Child Development*, 53, 786-798.
- Patterson, G. R. (1982). *A social learning approach to family intervention: Vol. 3. Coercive family process*. Eugene, OR: Castalia.
- Rachman, S. J. (1978). *Fear and courage*. San Francisco: W. H. Freeman.
- Risley, T. R., & Hart, B. (1968). Developing correspondence between the nonverbal and verbal behavior of preschool children. *Journal of Applied Behavior Analysis*, 1, 267-281.
- Rosenfarb, I., & Hayes, S. C. (1984). Social standard setting: The Achilles heel of informational accounts of therapeutic change. *Behavior Therapy*, 15, 515-528.
- Shalock, R., & Harper, R. (1978). Placement from community-based mental retardation programs. *American Journal of Mental Deficiency*, 83, 240-247.
- Skinner, B. F. (1945). Operational analysis of psychological terms. *Psychological Review*, 52, 270-277.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.
- Skinner, B. F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts.
- Skinner, B. F. (1969). *Contingencies of reinforcement: A theoretical analysis*. New York: Appleton-Century-Crofts.
- Skinner, B. F. (1974). *About behaviorism*. New York: Knopf.
- Telch, M. J., Bandura, A., Vinciguerra, P., Agras, S., & Stout, A. L. (1982). Social demand and congruence between self-efficacy and performance. *Behavior Therapy*, 13, 694-701.
- Weinberg, R. S., Yukelson, D., & Jackson, A. (1980). Effect of public and private efficacy expectations on competitive performance. *Journal of Sport Psychology*, 2, 340-349.
- Whitman, T. L., Scibak, J. W., Butler, K. M., Richter, R., & Johnson, M. R. (1982). Improving classroom behavior in mentally retarded children through correspondence training. *Journal of Applied Behavior Analysis*, 15, 545-564.
- Zeiss, A., Lewinsohn, P., & Munoz, R. F. (1979). Nonspecific improvement effects in depression using interpersonal skills training, pleasant activity schedules, or cognitive training. *Journal of Consulting and Clinical Psychology*, 47, 427-439.
- Zettle, R. D., & Hayes, S. C. (1983). Effect of social context on the impact of coping self-statements. *Psychological Reports*, 52, 391-401.
- Zettle, R. D., & Hayes, S. C. (1982). Rule-governed behavior: A potential theoretical framework for cognitive-behavioral therapy. *Advances in Cognitive-Behavioral Research and Therapy*, 1, 73-118.