

*THE PROBLEM OF PARENTAL NONADHERENCE IN  
CLINICAL BEHAVIOR ANALYSIS:  
EFFECTIVE TREATMENT IS NOT ENOUGH*

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Applied behavior analysts have developed many effective interventions for common childhood problems and have repeatedly demonstrated that childhood behavior responds to properly managed contingencies. The success of these interventions is dependent upon their basic effectiveness, as demonstrated in the literature, their precise delivery by the clinician to the parent, and adherence to or consistent implementation of the intervention. Unfortunately, arranging the consistent implementation of effective parenting strategies is a significant challenge for behavior analysts who work in homes, schools, and outpatient or primary care clinics. Much has been done to address issues of adherence or implementation in the clinic, but relatively little has been done to increase our understanding of the contingencies that affect parental adherence beyond the supervised clinic environment. An analysis of the contingencies that strengthen or weaken adherence might suggest strategies to improve implementation outside the clinic setting. What follows is an analysis of the variables associated with adherence by parents to recommendations designed to solve common childhood problems.

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Among the most widely disseminated procedures derived directly from the principles of applied behavior analysis have been those applied to the analysis and treatment of common childhood problems (e.g., Arnoldorfer, Allen, & Aljazeera, 1999; Schroeder & Gordon, 1991; Watson & Gresham, 1998). Applied behavior analysts have developed a myriad of effective interventions for common childhood problems and have repeatedly demonstrated that, even in loose-

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ly controlled applied environments, behavior often responds rather quickly to properly managed contingencies. Yet, despite these successes, some have maintained that simply providing repeated demonstrations of the effectiveness of behavioral technology eventually will yield diminishing returns to the field (Kunkel, 1987). If so, what new horizons await applied behavior analysts working with common childhood problems?

The answer lies, in part, in understanding that the success of an intervention is dependent not only upon its effectiveness but also upon its precise delivery by a clinician and the consistency with which parents implement that treatment with all of its essential features (e.g., Albin, Lucyshyn, Horner, & Flannery, 1996; Detrich, 1999; McConnell, McEvoy, & Odom, 1992). These elements comprise a necessary triad of features to achieve a satisfactory clinical outcome. The precise delivery of treatment by a clinician to the client has typically been called treatment integrity. The importance of treatment

integrity was underscored for applied behavior analysts by Peterson, Homer, and Wonderlich (1982), who elucidated the many interpretive pitfalls that await behavior analysts who have not ensured the critical features of the independent variable (e.g., topography, temporal parameters, etc.). However, successful treatment outcome also requires that a precisely delivered treatment is then delivered on a consistent basis. This has typically been referred to as treatment adherence, and it has been addressed within the context of the behavioral health literature for decades (e.g., Myers & Midence, 1998; Parrish, 1986; Sackett & Haynes, 1976).

Unfortunately, the behavioral health literature, as extensive as it is, contributes little to our understanding of the environmental controlling variables of parental adherence. Research efforts regarding medical adherence have largely attempted to predict adherence to interventions through evaluation of demographic, socioeconomic, and cognitive variables. Pretreatment and readiness variables, as exemplified by knowledge, memory, and beliefs, were thought to correlate with and predict adherence. Examples of this approach may be found in the health belief model (Rosenstock, 1974) and its conceptual heirs (see, e.g., Ajzen, 1991; Leventhal, Diefenbach, & Leventhal, 1992; Wallston, Wallston, & DeVillis, 1978). These models predict adherence based upon the subject's demographic variables, psychological characteristics, perceptions of disease severity, and benefits of treatment, among other attitudes and beliefs (Horne & Weinman, 1998). Thus, although several thousand articles have been published in the medical adherence literature, the focus has been almost entirely on the prediction of adherence behavior based upon subject variables (e.g., see Manne, 1998; Meichenbaum & Turk, 1987; Myers & Midence, 1998, for reviews) rather than the control of adherence behavior as a function of its consequences.

This is not to say that adherence has been completely ignored (e.g., Wahler, 1980). Indeed, a good deal of literature has addressed the problem of getting parents to make critical behavior changes necessary for successful treatment of childhood problems (e.g., Patterson & Chamberlain, 1988, 1994). Much of this literature, however, has focused on the training setting (i.e., clinic; e.g., Bates, 1977; Kelley, Embry, & Baer, 1979; Loeber & Weisman, 1975; Lowry & Whitman, 1989) and not the implementation setting (i.e., home). Few studies have addressed specific strategies for encouraging parents to adhere to recommendations (cf. Danforth, 1998; Fleischman, 1979; Globower & Sloop, 1976; Griest et al., 1982; Kelley et al., 1979), and there have been no programmatic efforts to explore treatment adherence in the same way that behavior analysts have investigated the issue of treatment effectiveness. By and large, investigators often assume that recommendations are implemented as prescribed. Perhaps the closest applied behavior analysts have come to studying adherence in a systematic fashion can be found in the treatment acceptability literature, much of it conducted with the implicit assumption that more acceptable treatments are more likely to be implemented (Watson & Gresham, 1998). However, there is little empirical evidence that links reports of treatment acceptability with actual treatment adherence.

Interestingly, although many common problems of childhood have been subjected to a contingency analysis, the problem associated with adherence to recommendations by parents is not one of them. Although some have attempted partial analyses of some aspects of parental adherence (e.g., Lundquist & Hansen, 1998), what is consistently missing is a thorough behavioral analysis of the contingencies that strengthen or weaken parental adherence. More specifically, a functional assessment is needed. A

functional assessment involves the systematic assessment of the variables of which a target problem (e.g., parental nonadherence) is a function. Although a functional assessment does not allow a simple matching of a problem (e.g., nonadherence) with a prepackaged clinical intervention, it can bring clarity and understanding to an otherwise confusing problem (O'Neill et al., 1997). Functional assessment is a process that can suggest strategies for redesigning clinical environments to improve implementation and adherence by parents. Toward this end, what follows is an assessment of the major variables that are associated with adherence by parents to recommendations designed to solve common childhood problems.

#### FUNCTIONAL ASSESSMENT OF PARENTAL ADHERENCE

Parental adherence to treatment is reflected in the extent to which the parent's behavior coincides with the recommendations of the treating professional. In general, variables that affect parental adherence are the same variables that affect any behavior and can be loosely organized under the general behavioral principles of interest: establishing operations, stimulus generalization, response acquisition, and consequent events (see Table 1). Within each of these variables, there are a number of processes that can affect parental adherence. Each of these adherence variables will be considered below, along with specific corresponding processes that are responsible for poor adherence.

##### *Treatment Effectiveness as a Prerequisite to Success*

A meaningful analysis of treatment adherence can be more easily pursued if it is presumed that treatment effectiveness is well established and that the intervention has been delivered with accuracy (integrity). This is not without caveats. Consider that parents

Table 1  
Adherence Variables

Establishing operations
Failure to establish intermediate outcomes as reinforcers
Failure to disestablish competing social approval as reinforcers
Stimulus generalization
Trained insufficient exemplars
Trained narrow range of setting stimuli
Weak rule following
Response acquisition
Excessive skill complexity
Weak instructional technology
Weak instructional environment
Consequent events
Competing punitive contingencies
Competing reinforcing contingencies

may have a number of conditions that function as barriers to adherence, conditions that are beyond the influence of the clinician (e.g., Dunst, Leet, & Trivette, 1988). These conditions include (a) cognitive impairment (i.e., the concepts of the intervention cannot be made simple enough to bring parental understanding to a level sufficient to master the skills, or the intervention requires concentration, memory, or sensory-perceptual skills that are impaired by preexisting conditions such as affective disorder or psychosis), (b) restricted economic resources (i.e., any intervention that would require time, materials, or living environment beyond the financial resources of the parent), and (c) social isolation (i.e., the intervention requires multiple caregivers who are unavailable due to divorce, distant or uninvolved relatives, few supportive friendships, etc.). In most cases, these conditions represent constraints on effectiveness and adherence. That is, if a parent is impeded in implementing an intervention (i.e., poor adherence) because of cognitive impairment, restricted economic resources, or insufficient social support, then the intervention could not be expected to produce reliable results and the treatment recommendations could be considered inappropriate from the outset. Interestingly,

behavior analysts are beginning to investigate whether some of these conditions may be subject to modification (e.g., Warzak, Parrish, & Handen, 1987), often at the community level (see Wahler, 1980, for an early discussion of some possibilities), and a variety of strategies have been suggested to address these barriers to successful treatment. Attempts to modify these conditions have typically involved elements such as parent support groups and linkages to mental health and social service agencies (Biglan, Metzler, & Ary, 1994). Community intervention research appears to offer much promise in ultimately improving some of these constraints on effectiveness, but it cannot take the place of the study and analysis of more proximal contingencies of adherence.

#### ESTABLISHING OPERATIONS

When an effective treatment has been selected and delivered with integrity, there are a number of pretreatment conditions that can influence the probability of adherence to those treatment recommendations. A behavioral account suggests that these pretreatment conditions are clinically important because each may function as an establishing operation (Michael, 1993). An establishing operation establishes the reinforcing effectiveness of a consequence and also evokes behaviors that have been reinforced by that consequence. It is likely that establishing operations play a significant role in all of applied behavior analysis, and a complete functional assessment should consider these operations (Schlinger, 1993; Sundberg, 1993). Although establishing operations have both reinforcer establishing effects and evocative effects, the latter is best thought of as a direct effect of the former. Thus, we will focus our assessment on reinforcer establishing effects and discuss operations that alter the reinforcing effectiveness of some aspect of the treatment environment.

#### *Failure to Establish Intermediate Outcomes as Reinforcers*

For many parents, their most frequent experiences with professionals dispensing advice are likely to revolve around health care recommendations that produce rather quick and marked improvements in health (e.g., antibiotic treatment of bacterial infections). Thus, health care providers become discriminative for the availability of quick improvements in health given appropriate adherence behaviors by parents. Through generalization, behavioral health professionals may also become discriminative stimuli for the availability of reinforcers with similar temporal parameters. When immediate or marked changes in behavior are not experienced, then adherence behaviors are effectively placed on extinction and in some cases may be punished.

The clinician may, however, be able to establish intermediate behavior changes as reinforcers, given that the parents have had reinforcing experiences following professional advice (see section on rule following below). Consider, as an example, the parent for whom the most salient reinforcer is the immediate and dramatic improvement in child compliance, but instead experiences an extinction burst of noncompliant behavior in his or her child. The clinician may be able to establish the extinction burst as a reinforcer rather than a punisher by identifying the likely burst as expected and as a sign of progress (e.g., Hobbs, Walle, & Hammersly, 1990). For example, a clinician might say, "It is not uncommon to see a brief increase in tantrums when you begin to ignore them. So an increase in tantrums is an early indication of success."

Consider another example in which parents have a child who is wetting the bed, but the clinician identifies noncompliance as an obstacle to treating bed wetting. In this case, the functional reinforcer for the par-

ents, elimination of bed-wetting, requires an intermediate step (improved compliance) that may be functionally neutral as a consequence for adherence. In this case, the clinician may be able to use instructions to establish an intermediate change in child behavior as a reinforcer, thus arranging a reinforcement history for adherence so that a more difficult and challenging goal (eliminating bed wetting) can be achieved later. A clinician who is interested in establishing an increase in child compliance as a reinforcer for adherence might say, "Your goal of eliminating bed wetting is our priority too. However, to solve this problem, we must tackle it in two steps. First, we must reduce oppositional behavior that might interfere with treating bed wetting. Therefore, we would like to begin by targeting compliance with parental instructions as our initial treatment goal. Once we have achieved that, we can begin working directly on bed wetting."

*Failure to Disestablish Competing Social Approval as a Reinforcer*

Parents may not adhere to recommendations because of the response of the social community to the recommended behavior-change procedures. Indeed, many behavioral procedures may be rejected by a culture predicated on the literature of freedom and dignity (Skinner, 1971). For example, a parent may have been instructed to ignore a child's tantrum, but in public, the social community is disapproving of tantrums. In a public context, the child's silence is established as a reinforcer, and any parental behavior that quickly brings about that response is reinforced. Unfortunately, this typically involves either an aversive control procedure whereby the tantrum is punished or negative reinforcement in which the parent "gives in" by meeting whatever demand evoked the tantrum.

Although there are probably few strategies a clinician can use that will alter the respons-

es of the larger social community, the clinician may be able to alter the effects of those responses via verbal instruction. For example, the clinician might suggest to parents,

People around you may not understand the strategies that you will be using to solve this problem. This is much like someone who is wearing braces on their teeth, who must endure teasing by others, knowing that the end results, although not immediately available, will be pleasing to everyone involved. You will have adults who will disapprove of allowing your child to cry and it may be tempting to give in to your child's demands, or perhaps even spank your child, but you must remember that your child's tantrums are simply an understandable, though unacceptable, attempt to obtain his or her wants or needs. Our goal is to teach your child that this behavior will no longer work, while teaching an alternative behavior that does.

The clinician may also choose to select an alternative treatment that will not contact these competing social contingencies. However, behavioral interventions for common childhood problems involve manipulations of observable environmental variables, so finding an effective procedure that involves visible manipulations that would assuage the concerns of a disapproving social group could be difficult. In the absence of effective treatments, these variables may have little relevance. But as effective behavioral technology has emerged, attending to these types of establishing operations (see Hayes & Wilson, 1993, for a discussion of "augmenting"; see also Smith & Iwata, 1997) may prove to be important to issues of treatment adherence.

STIMULUS GENERALIZATION

Adherence to a prescribed intervention requires that parental responses generalize to



environments beyond the clinic. Generalization can take at least two forms: (a) Control acquired by stimuli in the training environment must transfer to similar stimuli outside of the training environment (Skinner, 1953), or (b) control must transfer in the form of rule following (Hayes & Wilson, 1993; Hayes, Zettle, & Rosenfarb, 1989). To the extent that stimuli in the natural environment are discriminative for recommended parenting behaviors, or rule following occurs that formally corresponds with clinical recommendations, then generalization will be said to have occurred. Yet, arranging for relevant discriminative stimuli to occasion adherence in all relevant settings is not an easy task. Unfortunately, training a parent does not automatically mean that parenting skills will occur in contexts other than the one in which training took place. Thus, clinicians are required to attend to issues of generalization from the outset of treatment.

#### *Trained Insufficient Exemplars*

A parent may appear not to adhere to an intervention because the range of child behaviors (and their associated settings) that are discriminative for engaging in the parenting intervention is too small. This suggests that the clinician has not successfully trained sufficient exemplars (i.e., the stimulus class *target behaviors* is too narrow; cf. Stokes & Baer, 1977). For example, a parent may learn to use a time-out routine effectively to deal with a child who has frequently gained attention as a function of pinching playmates, but is confused and asks for advice when confronted with the same child who later chases a playmate with a stick.

One possible solution is to "train diversely," arranging for each parent to receive training with a wide range of potential target behaviors (Stokes & Osnes, 1989). Lowry and Whitman (1989) acknowledged the importance of this type of intervention for improving generalization and, in one of the few

studies actually addressing parental adherence, attempted to improve generalization by training parents of young infants to recognize multiple target behaviors. Unfortunately, they measured only changes in the parents' knowledge (i.e., verbal report) of relevant target behaviors rather than actual control of the parents' behavior by those target behaviors. An alternative strategy for resolving this problem may be to teach parents general principles of behavior management rather than, or in addition to, teaching them to change specific target behaviors (Forehand & Arkeson, 1977). There are laboratory data to suggest that teaching parents general principles of behavior modification can enhance generalization of skills to untrained behaviors and settings (Globower & Sloop, 1976). Perhaps a related strategy would be to teach parents to classify their child's behavior according to function rather than topography and to respond accordingly. In so doing, parents might learn to generalize across behavioral topographies more easily by virtue of an understanding of behavioral function. However, this may be conceptually much more difficult for some, and learning to detect multiple behavioral functions could make treatment unnecessarily complex (see section on skill complexity below).

#### *Trained a Narrow Range of Setting Stimuli*

A parent may be familiar with relevant target behaviors (or functions) but may not respond to them across all settings. If the clinic is the only environment in which a parent performs an intervention, or if only a few contexts set the occasion for intervention, then stimulus control is too narrow. This aspect of generalization has received a significant amount of attention in the behavioral literature (Stokes & Osnes, 1989), but little of the research has directly addressed the issue of parental adherence (Kendall, 1989). Strategies that may have rele-

vance for parental adherence include (a) increasing the range of stimuli that evoke parental intervention by arranging a variety of training conditions, which might involve rehearsing new parent behaviors in a variety of extratherapeutic settings with a variety of people present in a variety of everyday conditions (e.g., Lundquist & Hansen, 1998); (b) incorporating salient stimuli that can be present in training and nontraining conditions, which might involve presenting and reviewing a simple list of intervention steps during training and then posting the list on the wall at home or arranging for a spouse or relatives from multiple settings to be present during training (Hansen & MacMillan, 1990); and (c) incorporating salient self-mediated discriminative stimuli (e.g., Ayllon, Kuhlman, & Warzak, 1982) that can be maintained and transported by the parent as a part of treatment (e.g., the parent carries a discriminative stimulus that evokes appropriate treatment behavior, such as a notecard with relevant intervention steps, or self-monitors adherence).

The importance of self-control training with parents has long been recognized as a means of improving treatment outcome (Forehand & McMahon, 1981), but research has tended to focus on the measurement of changes in untargeted behaviors in untrained settings rather than measurement of actual parent adherence in untrained settings (e.g., Wells, Griest, & Forehand, 1980). In one of the few studies of parent adherence to recommendations, Sanders (1982) incorporated salient self-mediated stimuli by teaching parents to use a variety of self-management procedures. The intervention was a package of procedures in which the parents created a checklist of how to respond to the child's behavior. They reviewed with the child their expectations for the child and how they would respond to the child's misbehavior, they self-recorded their performance, and they arranged for

common social stimuli to be present across settings to enhance generalization of parenting skills. Sanders actually measured the parent's behavior in generalization settings, and the results showed marked improvement in adherence in untrained settings with the sequential introduction of self-management training.

#### *Weak Rule Following*

Rules are typically verbal antecedents that derive their function from two types of learning histories: (a) a history of socially mediated consequences for rule following per se, and (b) a history of a formal correspondence between verbal stimuli and the specific contingency described by the verbal stimuli (Hayes & Wilson, 1993). However, the parent typically comes to clinic with these learning histories already well established. Thus, parents whose rule-following behavior has been reinforced will be more likely to adhere to treatment recommendations than those who have not had such learning histories.

Unfortunately, clinicians are not likely to have much impact on a parent who has a history of little reinforcement for rule-following behavior. For example, if a parent has attempted to adhere to behavioral recommendations in the past and these efforts were punished or put on extinction (i.e., the efforts were unsuccessful), then one might expect poor adherence, perhaps underscoring the importance of taking a good history. On the other hand, there is no assurance that a parent with a positive learning history with respect to rule following will adhere to the rules or recommendations offered by the clinician. Recommendations provided by a clinician may not function as rules if they lack correspondence with rules from the parent's learning history. That is, to the extent that the language and concepts used by the clinician are highly discriminable from those characterized by rules successfully followed

in the parent's learning history, then generalized rule following may not occur.

Behavioral terminology may not correspond to the language of conventional rules about what governs human behavior (e.g., Allen, Barone, & Kuhn, 1993; Bernal, 1984). For example, for many parents, superstitious learning experiences reinforce a conventional rule that if one thing follows another, the second event was probably caused by the first. Because "feelings" often occur at just the right moment to serve as imputed causes of behavior, parents may not respond to rules about changing behavior that do not contain references to "feelings." In addition, contemporary concerns about behavioral technology undermining children's intrinsic reinforcement (e.g., Deci & Ryan, 1985; Lepper, 1981; cf. Dickenson, 1989) are generally reflective of parents' observations that external rewards are not necessary for behavior change. In fact, it is not unusual to hear in clinic that children should behave because "it is the right thing to do" and that rewards should not be necessary for behavior that is typically expected of children. In sum, in a typical clinical environment, recommendations that are characterized by behavioral terminology may be sufficiently discriminable from other rules in the parents' learning histories that generalized rule following may not occur and adherence to recommendations will be poor.

One solution may be to "repackage" the language of behavioral technology to be less discriminable from the language of contemporary culture. There is some evidence that descriptions of behavioral technology as applied to children are viewed as more acceptable when nontechnical terms are used (e.g., Witt, Moe, Gutkin, & Andrews, 1984; Woolfolk & Woolfolk, 1979). Clinical language may also need to highlight aspects of behavioral technology that are consistent with highly valued cultural constructs such as freedom, self-confidence, individual re-

sponsibility, and independence (Bailey, 1991). For example, a token reinforcement program for compliance, with response cost for noncompliance, might be presented as follows:

We are going to be asking Tim to make some very difficult behavior changes. These are important changes, because his noncompliance is unacceptable, but they will be difficult changes for him because they require him to learn some new rules. Children make changes toward independence and responsibility most easily when they are helped along with three things: (a) They receive reminders each day of rules they are working on, (b) they receive positive encouragement and acknowledgment each time they do well and make good choices, and (c) they receive a natural consequence each time they choose not to work on changing their behavior. The daily reminders can be handled nicely by placing a chart on the wall or refrigerator that lists the behaviors on which Tim is working. The encouragement can come from points or tokens that Tim can earn each time he follows the new rule. Because children appreciate attention and encouragement in concrete ways, Tim can then trade his points for a special privilege, activity or treat. You and Tim can make a list of things he can work to earn. On the other hand, each time Tim breaks a rule, you can take away one of the points or tokens Tim has earned. Of course, our goal is to have Tim do as you ask because it feels good when he does so and because he has learned it is the right way to behave. This program will help Tim to be more compliant, help him feel good about his success, and build self-control so that we can slowly withdraw the program



and have Tim following rules without daily reminders.

#### RESPONSE ACQUISITION

The specific parental responses required to produce desired changes in child behavior must be taught to the parents by the clinician. Fortunately, the components necessary for behavioral skills training are well established. Although arranging for parental acquisition of recommended behaviors is not always a simple task, attending to issues of skills complexity, instructional techniques, and teaching environment should facilitate skill acquisition.

##### *Skill Complexity*

The complexity of an intervention has been described as one of the most consistent predictors of adherence (Meichenbaum & Turk, 1987), and it is undoubtedly a relevant variable in teaching parents intervention strategies for managing common behavior problems in children. Response acquisition requires that the clinician perform an adequate task analysis and reduce the intervention into small, manageable, easy-to-learn steps (e.g., "attention" includes physical touch, general praise, and specific praise, whereas "nonattending" is comprised of looking away, turning away, and vocal silence). It is possible that, even after a clinician has reduced an intervention into the smallest manageable steps, the task is still too complex for a particular parent. In such a case, however, it would be difficult to argue that the clinician had selected an appropriate intervention. Perhaps more important, clinicians should be developing interventions that are less complex from the outset. Component analyses are a staple of good clinical research (e.g., Buskist, Cush, & DeGrandpre, 1991; Cooper et al., 1995; Rose & Church, 1998; Rosenbaum & Ayllon, 1981), and they may be necessary for im-

proving response acquisition and ultimately treatment adherence.

##### *Instructional Techniques*

Good instructional technology is well established, and specific training procedures (e.g., prompting, shaping, chaining, and differential reinforcement) are typically combined into a behavioral skills training package that includes instruction, modeling, rehearsal, and feedback (Miltenberger, 1997). Adherence problems might arise, for example, in situations in which a clinician provided a very thorough verbal description of an intervention but failed to provide direct instruction via techniques such as modeling, rehearsal, reinforcement, or corrective feedback. Some have promoted written prescriptions (e.g., Cox, Tisdelle, & Culbert, 1988) or brief "protocols" to assist providers in learning new behavioral techniques (Christophersen, 1994; Danforth, 1998; Kuhn, Allen, & Shriver, 1995). These protocols list, in simple language, step-by-step instructions for completing an intervention, but there is not good empirical support for these as replacements for rehearsal and feedback. Although protocols may set the occasion for following therapist instructions in the absence of the therapist, clinicians who assume a high correspondence between the verbal behavior of a parent and the actual performance of an intervention are likely to be disappointed (Loeber & Weisman, 1975; Myers & Midence, 1998; Parrish, 1986).

##### *Teaching Environment*

Finally, even good instructional technology may not be able to overcome a poorly controlled teaching environment. A parent may be unable to attend to the therapist if there are more salient stimuli (e.g., children are making noise, ambient environment is uncomfortable, etc.) present during teaching.

## CONSEQUENT EVENTS

The emphasis in operant conditioning is on the effects of reinforcement, and the literature in behavior analysis has been dominated for over 50 years by a range of studies and texts dedicated to providing ever more systematic and refined accounts of consequent events (e.g., Ferster & Skinner, 1957; Glenn, 1991; Henton & Iversen, 1978; Honig & Staddon, 1977; Reynolds, 1975; Sidman, 1986; Skinner, 1969). This interest in consequent events reflects the general recognition that consequences are the “main-springs of behavior control” (Brady, 1978), so it is not surprising that these events have perhaps the most significant impact on adherence. Multiple concurrent schedules and remote contingencies come to bear on a parent’s adherence with intervention recommendations, and, unfortunately, only a few are directly accessible to the clinician. Indeed, Skinner recognized that naturally occurring contingencies seldom support the application of behavioral technology (see Heward & Malott, 1995, for a brief review of the implications), and applied behavioral technology often competes poorly against naturally occurring contingencies that support other less professionally acceptable (and typically punishing) means of controlling behavior (Skinner, 1953). In addition, those same natural contingencies may punish attempts at adherence.

*Competing Contingencies That Punish Attempts at Adherence*

Over 20 years ago, Patterson (1976) proposed a “negative reinforcement trap” to explain child noncompliance. Patterson proposed that escalating coercive behavior by a child could be negatively reinforced by intermittent withdrawal of controlling behavior (e.g., demands) by parents. This same paradigm helps to explain why parents may have a difficult time adhering to behavioral

recommendations. Attempts at controlling a difficult child with procedures as simple as differential reinforcement or time-out can frequently be met with escalating coercive behavior that is punishing to the parent.

Even when positive-reinforcement-based procedures are implemented, a parent’s attempts at implementation may initially be punished by unpleasant and aversive child behaviors that occur when the parent delivers the reinforcer. This may occur because parent proximity is discriminative for disruptive behavior by the child. But this behavior may also occur because of response induction. That is, the reinforcement of a desirable response may lead to the strengthening of other behaviors that have a history of being maintained by the same consequence (Balsam & Bondy, 1983), consistent with those behaviors being members of the same operant response class. Although we have not seen this described in the applied literature, we have found (as have others) that it is not uncommon to find parents who report that their efforts to “catch their child being good” with the delivery of attention (e.g., praise and touch) have been punished because the delivery of positive consequences by the parent evokes aversive child behaviors (e.g., whining, interrupting, throwing toys, hitting sibling, etc.) that have, in the past, resulted in the delivery of the same consequences (i.e., parent attention). Of course, one would expect this effect to diminish rapidly with differential delivery of reinforcement, but preparing parents for the possibility (see section on establishing intermediate outcomes as reinforcers) may be important.

*Competing Contingencies That Reinforce Behaviors Incompatible with Adherence*

Attributing poor adherence to parents who are “not motivated” is a common attribution error that clinicians cite far too often to explain treatment failure. On the other

hand, an analysis of the schedules of reinforcement avoids problems inherent with motivational terms. When there are concurrent schedules of reinforcement (and in the natural environment, there are always concurrent schedules), parents, like everyone else, will most often engage in behavior that results in (a) more frequent reinforcement, (b) a greater magnitude of reinforcement, (c) more immediate reinforcement, and (d) less response effort.

Unfortunately, for a parent of a child with a common behavior problem, there are likely to always be multiple concurrent schedules that support behavior that competes effectively with prescribed interventions. For example, consider a skilled parent who is provided with simple recommendations that involve use of differential attention and tokens for on-task homework behavior by a child. The parent may find that remaining in front of the television provides more immediate, more potent, and more easily and frequently accessed reinforcers than those available for adhering to a behavior management program. Of course, clinicians often have little control over these competing contingencies. Although there may be some opportunities to eliminate the competition (i.e., change the competing contingencies), these are likely to be rare. Nonetheless, an assessment of the competing contingencies that are likely to influence adherence is valuable. Understanding the competition may place a clinician in a better position to select an intervention that can successfully compete with concurrent schedules of reinforcement. This may require initially selecting modest goals and targeting simple behavior that will be easy to change and that will produce immediate and salient effects, with the result that parent participation in the intervention, and by extension, in treatment, is reinforced. Not coincidentally, success in this way also serves to maintain the therapist's behavior.

Perhaps most central to the functional as-

essment of adherence is the fact that child behavior change is often delayed and can rarely compete with more immediate reinforcement available for alternative non-adherence behaviors, even though that reinforcement may be less potent. One solution may be to create intermediate reinforcing social contingencies that establish and maintain working for temporally distant reinforcers (Follette, Bach, & Follette, 1993). Not surprisingly, those who do clinical work have long considered it important to establish the clinician as a conditioned reinforcer. A relationship in which the clinician's behavior is reinforcing for the client is one in which "rapport" is said to have been established. This may require the use of words and actions by the clinician that reflect interest and concern (e.g., eye contact, reflective comments) and that are supportive and positive (e.g., praising past parenting efforts). Indeed, clinicians who engage in these "empathic" and "nonjudgmental" behaviors are thought to be more likely to be effective parent trainers (Bernal, 1984). More specifically, clinicians who take the time to establish themselves as mediators of social reinforcement may be more likely to have their approval acquire the reinforcing strength necessary to maintain adherence until child behavior changes (i.e., natural reinforcers) begin to appear.

Another solution to the problem that child behavior change is often delayed and not an effective reinforcer for adherence by parents has been to create a competing reinforcement contingency that does not rely exclusively on child behavior change as a reinforcer. For example, a clinician might recruit a spouse or friend to reinforce adherence in the home environment. Others have suggested having parents deposit a large sum of money (e.g., the entire cost of the training program), which is then refunded contingent upon attendance at training sessions and assignment completion (e.g., Eyberg &

Johnson, 1974) or providing parent “salaries” in which payments are delivered contingent upon compliance with treatment (e.g., Bernal, Klinnert, & Schultz, 1980; Fleischman, 1979). Results have found that these systems produce significant improvements in attendance, participation, and homework completion; however, we were unable to find any evidence that similar systems have been used to strengthen posttreatment adherence. The practical problems with verifying adherence in a natural setting and the cost of doing so may make it impossible to implement this type of competing schedule of reinforcement.

Response effort, on the other hand, appears to be readily accessible and controllable by the clinician. As such, attention to response effort may be one of the most critical components of arranging for parental adherence. Interestingly, whereas most basic and applied research on response effort has demonstrated that increasing response effort is an effective response-reduction procedure with enduring effects, there have been relatively few studies looking at decreasing response effort as a means of increasing the frequency of desired responses (Friman & Poling, 1995). In fact, there is little empirical evidence that response effort has been considered to be an important independent variable by clinical behavior analysts, certainly not as an accelerative technique and especially not in the study of treatment adherence.

#### FUTURE DIRECTIONS

For much of applied behavior analysis, research on treatment effectiveness continues to be a valid focus. The refinement of assessment and treatment technology to bring new levels of behavioral control and efficacy in controlled or analogue environments has been and will continue to be valuable. Yet, a balanced applied science requires more.

For example, it has been suggested that research on treatment efficacy should lead logically to research on field effectiveness that explores the applied impact and practicality of behavioral interventions (Strosahl, Hayes, Bergan, & Romano, 1998). But perhaps even more important, research on treatment efficacy should include efforts to assess the extent to which procedures require special modifications to ensure adherence. In particular, for those clinical behavior analysts who deal with everyday common childhood behavior problems in loosely controlled, natural environments such as homes, schools, and primary care clinics, arranging for adherence by parents to recommendations is a formidable challenge. Indeed, it is precisely the requirement of controlling parent behavior in an unpredictable and uncontrolled environment that makes doing research in this area so daunting. Consider that school psychologists have, for over 20 years, discussed the problems associated with treatment adherence following behavioral consultation in classrooms, yet recent reviews have found no empirical studies directly evaluating strategies for improving adherence by teachers (Noell & Witt, 1996, 1999). Whether it is because research on treatment adherence is too difficult is not clear, but behavior analysts should expand their focus to include studies on how to enhance adherence. Perhaps the most important variable to consider when developing a direction for research on treatment adherence is practicality (Myers & Midence, 1998; Strosahl et al., 1998). Although some promising interventions have been proposed and a few even researched, there is much that remains to be done. Provided below are several recommendations about potential lines of research within each domain.

#### *Establishing Operations*

One of the most fruitful arenas for empirical research may involve the use of estab-

lishing operations when dispensing behavioral advice. Establishing operations are not simply technological details (Reynolds, 1975), but are controlling variables in their own right (Schlinger, 1993). To the extent that clinicians can alter the reinforcing effectiveness of their own behavior or likely clinical outcomes by virtue of what they say in the clinic, then establishing operations may be a valuable means of arranging the reinforcement of adherence behaviors by parents. These operations seem to be particularly promising because changing what a clinician says is likely to require little alteration in the clinical routine and require almost no effortful changes by parents. It is easy to see why one might wish to attend to the clinical implications of establishing operations, and more applied behavior analysts are doing so. However, efforts thus far have focused largely on adult populations (e.g., Hayes & Toarmmino, 1999; Kohlenberg & Tsai, 1991) or persons with developmental disabilities (McGill, 1999). As yet, there have been no efforts to explore the contributions that establishing operations might have for enhancing adherence to treatment recommendations by parents.

#### *Stimulus Generalization*

As with strategies that target pretreatment establishing operations, there is little well-controlled empirical research of any specific antecedent strategies for enhancing adherence. Even in the behavioral health literature, where prompting strategies are often included in treatment packages, individual procedures have not been widely studied as a means of incrementally enhancing adherence (e.g., Christophersen, 1994; Manne, 1998; Meichenbaum & Turk, 1987; Myers & Midence, 1998). This is disappointing, but not surprising, given the historical focus in behavior analysis on consequences as determinants of behavior. However, there does exist a conceptual framework for describing

and interpreting antecedent stimuli (see Smith & Iwata, 1997, for a review), and study of antecedent influence on adherence behavior offers much promise.

Perhaps the most promising antecedent control procedures may have to do with improving setting generalization by rehearsal of recommended skills in multiple settings. Of course, one option is to have the clinician train parents in multiple settings. An alternative, however, may be to extend to parent training the research on the training of trainers. Neef (1995b) has suggested that the focus of training trainer research is actually less on ensuring treatment adherence and more on guiding individuals to choose, adapt, and apply interventions to suit local conditions, but the relevance for generalization is obvious. Results of studies that included parents or teachers as intervention agents in a pyramidal training paradigm have often found that serving as a trainer enhanced the training parent's own skills (Jones, Fremouw, & Carples, 1977; Neef, 1995a). Perhaps having a parent, under the supervision of a clinician, train a friend, spouse, or grandparent would be an efficient means of arranging generalization across settings.

#### *Response Acquisition*

Skill acquisition is probably more closely linked to treatment effectiveness than to treatment adherence. It may be for this reason alone that skill acquisition has received a good deal of attention and is likely to continue to be researched. Instructional technology is well established, and efforts to investigate and improve adherence seem best focused elsewhere. The most promising area of skill acquisition research may be efforts to reduce treatment complexity. Researchers continue to conduct component analyses, but with goals often focusing more on identifying functional relations than on improving adherence. But applied behavior analysts should be dealing with problems that are



considered important simply by virtue of their importance to society. Parents want solutions to everyday problems, but they also want solutions to which they can reasonably be expected to adhere. Thus, determining which components of a multicomponent treatment package are the ones responsible for the best outcome may not be as valuable as determining which components both produce a reasonable outcome *and* are likely to be followed by parents. In sum, effectiveness and adherence are both necessary elements of developing successful treatments, but neither are sufficient by themselves. Research that specifically targets the development of simple-to-implement and streamlined behavioral technology for the purpose of improving adherence is warranted.

#### *Consequent Events*

The systematic control of consequent events has been the most characteristic dimension of behavioral technology to date, and it makes sense that behavior analysts should direct considerable effort at developing pragmatic behavioral interventions that can compete with prevailing contingencies for nonadherence. The effort to create intermediate reinforcing social contingencies that establish and maintain working for temporally distant reinforcers has appeared promising (Follette et al., 1993). That is, clinicians who establish themselves as conditioned reinforcers may be more successful in using social approval for adherence as an intermediate reinforcing contingency. Interestingly, several researchers have, in large group studies, attempted to look at the effects of parents establishing themselves as reinforcers for children (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Wahler & McGinnis, 1997), and there have been recent efforts to measure these same effects between clinicians and parents. Although clinicians who establish themselves as conditioned reinforcers produce higher levels of

satisfaction and skill acquisition in parents, measures of parental adherence have not been included (Cheryl McNeil, personal communication).

Electronic technology could also provide the means of more effectively competing with contingencies for nonadherence (through reduced response effort), yet behavior analysts generally have engaged in little product development (Bailey, 1991). This is surprising given that behavior analysts were widely involved in the early development of new technology for use in modifying behavior (e.g., Budzynski & Stoyva, 1969; Cleary & Packham, 1968; Schulman, Stevens, Suran, Kupst, & Naughton, 1978). Yet, although some recent efforts have explored adaptations of technology from the medical community (e.g., Brasted & Callahan, 1984; Costa, Rapoff, Lemanek, & Goldstein, 1997; Rapp, Miltenberger, & Long, 1998), by and large, behavior analysts' efforts at product development have not kept pace with the promise afforded by available electronic technology, especially in regard to technology for improving adherence.

There are some exceptions. For example, the attention training system (ATS) was specifically conceptualized as a means of reducing response effort when implementing a response-cost procedure (Rapport, Murphy, & Bailey, 1982) in a classroom with children with attention deficit hyperactivity disorder. The ATS is a small box with a digital display that registers a point each minute that the child is engaging in the desired behavior, such as "on-task" and "following directions." Points can typically be exchanged for rewards at a later time. The teacher module is a remote control device, about the size of a pager, that is used to deduct points for off-task or disruptive behavior. The ATS is extremely easy to use and appears to require little change in classroom routines. Initial research conducted in special after-school pro-

grams (Gordon, Thomason, Cooper, & Ivers, 1991) and in self-contained behavior management classrooms (DuPaul, Guevremont, & Barkley, 1992; Evans, Ferre, Ford, & Green, 1995) has found it to be quite effective, and a recent study in two regular education classrooms found similar results (Polaha & Allen, 2000).

In another example, Jason (1985) developed a token-actuated electronic timer for use with a token-exchange system for controlling television access. The electronically controlled device was developed as a means of checking the accuracy of parent-reported data, but it has remarkable potential as a means of enhancing adherence. An electronic token-activated timer could reduce the response requirements for parents implementing reinforcement programs (e.g., Wolfe, Mendes, & Factor, 1984) in which access to television is to be delivered contingent upon desired changes in child behavior. Its utility as a device for improving treatment adherence appears to warrant further investigation.

These examples demonstrate some of the possibilities for reducing response effort associated with behavioral programming. Encouraging graduate students to pursue this line of inquiry may be valuable, but it will likely take more than just encouragement. For example, collaboration with biomedical or electronic technology specialists may also be required. In addition, producing graduate students who are interested in problems of adherence may require that clinical behavior analysts shape a broad, balanced view of behavior analysis as a clinical science that requires pursuit of effectiveness, integrity, and adherence to achieve a satisfactory clinical outcome.

#### FINAL CONSIDERATIONS

We have suggested that clinical behavior analysts need to look beyond the contingen-

cies that control the behavior of the child and to look at those that control the behavior of the parent. It is these contingencies that determine parental adherence. Of course, pursuit of better adherence by parents requires not only a careful consideration of the contingencies of adherence but also the development of a methodology for studying adherence. This is a thorny problem and one that cannot be dealt with adequately here. But consider that the very act of measuring parental adherence introduces significant problems. Whereas behavioral health researchers have dependent measures such as blood assays and pill counts, behavior analysts rely heavily on direct observations of the phenomenon of interest. Yet, the very act of observing will likely produce changes in adherence that are not representative of adherence in the absence of the clinician.

The study of parental adherence also requires a better operationalized definition of what adherence is and what it is not. It remains an empirical question how many times, in either frequency or percentage of opportunities, a parent must be adherent to obtain clinically significant therapeutic effects. Within the context of multiple sources of stimulus control, concurrent schedules, and a host of other potential confounding effects, these questions are unlikely to yield to simple analyses. Yet, they remain crucial to an understanding of what constitutes adherence, how adherence is to be measured, and ultimately, what contributes to it.

Finally, clinical behavior analysts must also broaden their perspective and consider the contingencies that govern the behavior of the clinician. For clinicians, like the parents with whom they work, there are a variety of competing contingencies that determine which interventions are selected and how they are implemented. Clinicians and parents alike want solutions to problems that do not require them to expend considerable

effort or to alter their clinical routines to any great degree. It would be preferable to think that a client's welfare comes first and that issues related to ease of implementation for the clinician are not a relevant factor. But clinical behavior analysts are not free from the natural laws that govern human behavior, and it is best to remember this when pursuing research on treatment adherence.

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