

Outcome of Parent-Mediated Treatment of Preschoolers With Attention Deficit Disorder With Hyperactivity

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Despite the early onset of attention deficit disorder with hyperactivity (ADHD), there is a dearth of treatment studies with preschoolers with this disorder. Forty-six families with ADHD preschoolers were randomly assigned to either an immediate or a delayed group parent training program aimed at improving child compliance. Groups were balanced on demographic variables. Treatment outcome was evaluated by comparing the groups at pre- and posttreatment and 3-month follow-up on measures of parent-child interactions during free play, a compliance task, and parent-supervised activities, as well as on parent-completed Conners Hyperkinesis Index scores. Positive treatment effect was obtained on measures of compliance, parental style of interaction, and management skills. These improvements were maintained at 3-month follow-up. Evaluation of treatment effects on nontargeted child behaviors indicated no generalization.

Until recently, there has been a dearth of empirical studies of attention deficit disorder with hyperactivity (ADHD) in preschoolers, despite the diagnostic criterion of onset prior to age 7 years (American Psychiatric Association, 1980). Prospective research (Palfrey, Levine, Walker, & Sullivan, 1985) has identified peak onset between 3 and 4 years of age. Diagnosis in the preschool years can be reliable and prognostic of difficulties at school entry (e.g., Campbell, Breaux, Ewing, & Szumowski, 1986; Campbell, Endman, & Bernfeld, 1977; Schleifer, Weiss, Cohen, Elman, Cvejic, & Kruger, 1975).

The preschool period presents parents with particular problems in child management and is associated with high levels of parental stress and low parenting self-confidence (Mash & Johnston, 1983). Campbell et al. (1986) noted that among parent-identified problem preschoolers, negative and noncompliant behavior during free play with mother was the only child variable that contributed significantly to maternal ratings of hyperactivity. Problems of noncompliance are particularly acute during the preschool years (Ross & Ross, 1982) and remain a primary complaint of parents of ADHD children (Schaefer, Palkes, & Stewart, 1974).

The limited outcome research on the treatment of ADHD preschoolers has yielded discouraging results. Neither pharmacological (Conners, 1975; Schleifer et al., 1975) nor cognitive self-control interventions (Cohen, Sullivan, Minde, Novak, & Helwig, 1981) have produced the benefits associated with school-aged ADHD children. Parent training in behavior management of ADHD children (Campbell, 1985; Dubey & Kauf-

man, 1978; Schaefer et al., 1974) has provided some evidence of short-term benefits, but methodological weaknesses including small samples, reliance on parental report measures, and non-experimental designs underscore the need for more rigorous experimental study.

Individual parent training using a compliance training model (Forehand & McMahon, 1981) has been applied with reported success to behavior-disordered preschool and school-aged children (Forehand & King, 1977; Peed, Roberts, & Forehand, 1977). Outcome measures included objective observations as well as parent report. However, samples have been small and of indeterminate or heterogeneous diagnoses. Length of treatment was variable on an individual basis and was based on predetermined criteria for progression through the training program.

Pollard, Ward, and Barkley (1983) evaluated a standard 8-session individual parent training intervention with 3 school-aged ADHD children. A multiple baseline across subjects design was used to evaluate the effects of parent training and medication, alone and in concert. However, extremely high levels of pretreatment compliance for 2 of the 3 children precluded the evaluation of parent training on problematic levels of noncompliance.

Although the results of these parent training studies are suggestive, it remains to be demonstrated that the positive outcome of compliance training can apply to preschoolers in particular, and more specifically to preschoolers whose attentional deficits and impulsive and hyperactive behaviors may create special difficulties in the modification of noncompliance. The purpose of this study was to evaluate the efficacy of a group parent training program aimed at improving the compliance of ADHD preschoolers.

Method

Subjects

The study was conducted in the Psychology Department of the Children's Hospital of Eastern Ontario, a large pediatric hospital. All sub-

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jects were referred by physicians for assessment and treatment of suspected ADHD. Subjects met the following inclusion criteria:

1. *Diagnostic and Statistical Manual of Mental Disorders-III (DSM III;* American Psychiatric Association, 1980) criteria for diagnosis of ADHD as reported by the parent in a structured screening interview. No independent reliability checks for diagnosis were conducted. However, consultation with the supervising PhD psychologist was used in cases of questionable diagnoses. Concurrent diagnoses were not determined, but diagnostically relevant information about co-occurring problems was gathered (Table 1).

2. At least one rating of one standard deviation above the age and sex mean on the Hyperkinesia Index of the Revised Conners Behavior Questionnaire (Goyette, Conners, & Ulrich, 1978). Each child was rated by at least one parent. Questionnaires completed by another significant caregiver (teacher or daycare provider) were available on 85% of the sample at pretreatment, and 19 children qualified on the basis of both parent and other caregiver ratings. No subjects qualified on the basis of other caregiver ratings alone.

3. Percentage of child compliance to total parental commands $\leq 60\%$ at pretreatment in a standardized compliance task.

4. Standard score equivalent ≥ 80 on the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981) if unilingual English ($n = 42$) or ≥ 72 , if bilingual ($n = 4$).

5. Between 3 and 6 years old and not attending Grade 1.

6. Hyperactivity medication status (i.e., methylphenidate) constant throughout participation. Of the 5 children on medication during the study, an increase in dosage was reported for 1 child.

Over an 18-month recruitment period, 153 families were referred and 50 agreed to participate. The reasons families did not participate were failure to meet inclusion criteria or language requirement (i.e., conversant in English; 41); abatement of the presenting problems (23); preference for individual treatment as opposed to the experimental group program (22); and other, such as residential move or failure to keep initial appointment (17).

Of the 50 families who agreed to participate, 2 families from each group withdrew after group assignment, resulting in an overall dropout rate of 8%. Characteristics of the 46 families completing the study are presented in Table 1. Comparisons of treatment and control groups reveal that they were comparable on all measures.

Screening Procedure

Screening consisted of three sessions attended by the child and the parent who spent the most time with the child (the target parent). With the exception of one parent, all target parents were mothers. Nontarget parents typically attended initial diagnostic interviews. All assessment sessions were conducted by an MA-level therapist and took place in a room equipped with a one-way mirror, age-appropriate toys, and living-room furniture. Session 1 involved a comprehensive diagnostic interview. In Session 2, parents completed questionnaires and consent forms while the child was administered the Peabody Picture Vocabulary Test. The behavioral assessment that included the compliance task composed the third session.

Behavioral Assessment

The behavioral assessment consisted of 20 min each of free play, a compliance task, and parent-supervised activities. The assessment began with 10 min of free play in which the target parent was instructed to interact with the child as the parent would at home. This was followed by the compliance task, in which the parent was instructed to issue 15 predetermined simple commands (adapted from Barkley, 1981). The parent-supervised activities followed a short break. Parents were instructed to provide assistance to their children as desired. The first activ-

ity required the child to copy a series of increasingly complex designs using plastic shapes. The child's on-task behavior during this 10-min activity served as a measure of sustained attention. For the following 10 min, the parent supervised the child's completion of four age-appropriate puzzles. The assessment concluded with a second 10-min period of free play.

Coded Behaviors

The parent-child interactions during the behavioral assessment were coded from videotape following Forehand and McMahon's procedure (1981) by a rater uninformed about group assignment. All identified behaviors were coded continuously in 30-s blocks of parental antecedent, child response, and parental consequence sequences. Table 2 outlines the behaviors coded.

Interrater reliability was established by a second independent rater, who coded a random selection of one eighth of the tapes with equal representation of groups, times of assessment, and behavioral tasks. For mean time on task, reliability checks were based on identification of the beginning and end of each period of sustained attention for consecutive 30-s intervals. Kappa statistics were obtained for each coded behavior. They ranged from .614 for child-inappropriate behavior to .946 for beginning of on-task behavior.

Outcome Measures

Child compliance variables. The primary measure of compliance was child compliance relative to total number of parent commands, that is, percentage of compliance (Forehand & McMahon, 1981). Changes in percentage of compliance could reflect changes in any one or a combination of the measure's three component behaviors: frequency of child compliance, frequency of parent alpha commands, and frequency of parent beta commands. Higher scores on this measure reflected increased cooperation between parent and child with respect to parental commands and child response. The second measure, absolute frequency of child noncompliance, focused more specifically on child behavior. The third measure, derived from percentage of compliance, was created as a dichotomous criterion measure of clinical improvement. On the basis of previous research findings (Forehand, Griest, & Wells, 1979; Roberts, McMahon, & Forehand, 1978), the criterion was established a priori as a minimum increase of 50% from pretreatment to posttreatment in percentage of compliance during the compliance task.

Nontargeted child behavior variables. Generalization of treatment effects to nontargeted child behaviors was assessed by measures of frequency of inappropriate behaviors, mean time on task during the 10-min parent-supervised design activity, and parent-completed Conners Hyperkinesia Index scores.

Parent behavior variables. The first measure, percentage of alpha commands, was an index of the frequency of appropriate (alpha) commands issued by the parent, relative to all commands issued. The second measure, percentage of child compliance reinforced, reflected how consistently the parent reinforced child compliance. Frequency of time-outs was not subjected to analysis because frequency was low. The second set of variables measured overall changes in parents' style of interacting with their children. Three measures were used: the percentage of all parental coded behavior that was directive in nature (i.e., commands and questions), the percentage that was positive, and the percentage that was negative.

Design

Parents of eligible children were randomly assigned to an immediate treatment group (experimental group) or a delayed treatment group (control group) with the constraint that the two groups were balanced in

Table 1
Characteristics of the Sample: Means, Standard Deviations, and Frequencies

Variable	Entire sample (<i>N</i> = 46)	Treatment group (<i>n</i> = 23)	Control group (<i>n</i> = 23)	<i>t</i> (44, two-tailed)
Child				
Age (months)				
<i>M</i>	49.8	49.9	49.8	
<i>SD</i>	9.4	9.9	9.1	0.02
PPVT ^a				
<i>M</i>	99.6	98.8	100.5	
<i>SD</i>	12.9	11.7	14.2	-0.44
Conners Hyperkinesis Index ^b				
<i>M</i>	2.0	1.9	2.1	
<i>SD</i>	0.4	0.4	0.4	-1.63
Conners Conduct Problem ^b				
<i>M</i>	1.4	1.2	1.5	
<i>SD</i>	0.5	0.5	0.6	-1.94
Conners Anxiety ^b				
<i>M</i>	0.9	0.8	1.0	
<i>SD</i>	0.9	0.9	0.9	-0.66
Percentage of compliance ^c				
<i>M</i>	40.0	39.7	40.4	
<i>SD</i>	9.5	10.0	9.2	-0.27
Mean time on task ^d				
<i>M</i>	64.9	73.9	55.9	
<i>SD</i>	49.8	62.1	32.3	1.23
Sex				
Male	37	18	19	
Female	9	5	4	
Medication for ADHD				
On	5	2	3	
Off	41	21	20	
Family				
Family constellation				
Single-parent	7	4	3	
Two-parent	39	19	20	
Education of target parent				
Without postsecondary	25	13	12	
With postsecondary	21	10	11	

Note. ADHD = Attention Deficit Disorder with Hyperactivity. For all frequency measures, $\chi^2(1, N = 46) = 0$.

^a Standard score equivalent for Peabody Picture Vocabulary Test—Revised. ^b Rated by target parent. ^c Based on criterion compliance task. ^d Based on parent-supervised design activity; in seconds.

terms of sex of child, family composition (single- or two-parent family), educational level of the target parent, and medication status of the child.

Behavioral assessments were conducted, and Conners parent questionnaires were obtained at pretreatment, at posttreatment, and at 3-month follow-up for both groups. Families in the control group received the equivalent treatment after the 3-month follow-up assessment. Control parents were told that normal developmental changes needed to be monitored to determine what effects treatment had over and above maturational gains. Both treatment and control families attended all assessments. Parents were queried at each assessment about other parent training received during that period, and no additional parent counseling was reported.

Intervention

The treatment program was adapted from Forehand and McMahon (1981) and Barkley (1981). Approximately 10 families composed each of the five successive cohorts. The program was conducted weekly for 12 weeks. Target parents attended 10 evening group sessions and had two individual in-clinic sessions with their child. Participation of non-

target parents was strongly encouraged, and 33 of a possible 39 nontarget parents attended an average of 70.5% of the group sessions.

A parent manual was developed that included directed readings and specially designed homework assignments. Sessions 1 through 3 were didactic in nature. Basic concepts regarding bidirectional influences on parent-child interactions and behavior management principles were introduced. Information about the etiology, course, and treatment of ADHD was presented. Practical issues such as developing support networks, childproofing the home, and developing realistic expectations were raised and discussed. Sessions 4 through 11 were skill-oriented. Through modeling, role-playing, didactic material, and in vivo rehearsal, three basic strategies were taught: how to give differential attention to appropriate behavior, how to issue appropriate commands, and how to use time-outs for noncompliance. Session 12 provided a review with guidelines for managing future problems.

Following instruction in differential attention and commands and again after instruction in implementing time-outs, each target parent and child was seen in the clinic for individual instruction using standardized tasks and videotape feedback. At comparable points in time, control parents and their children also attended individual in-clinic ses-

Table 2
Description of Parent and Child Behaviors

Category	Description
Parent behavior	
Command	
Alpha command	An order, suggestion, question, rule, or contingency to which a motoric response is appropriate and feasible and that is not followed by another parent behavior for 5 s.
Beta command	A vague command or conditional command that offers the child a choice or command as described above (alpha) but that does not provide an opportunity for compliance (e.g., command is interrupted within 5 s by another parent behavior, the parent complies with the command, or the parent restricts the child's mobility thereby preventing compliance).
Question	An interrogative that is time-bound to the present and to which a child verbal or nonverbal response is expected.
Positive	A verbal or physical expression of positive evaluation or approval of the child or child's behavior, past, present, or future.
Negative	A verbal or physical expression of corrective or negative evaluation or disapproval of the child or child's behavior, past, present, or future.
Reinforcement of child compliance	A positive occurring within 5 s of initiation of child compliance.
Child behavior	
Compliance	The initiation of a requested behavior within 5 s of the termination of parental alpha command, or the initiation of inhibition of a specified response within 5 s of termination of parental alpha command, followed by maintenance of inhibition for 5 s.
Noncompliance	Failure to initiate compliance within 5 s of the termination of parental alpha command, or in the case of inhibition, failure to maintain inhibition for 5 s.
Inappropriate behavior	A broad category that includes whining, crying, yelling, tantrums, aggression (excluding aggressive behavior appropriate within the context of the play situation), and deviant talk.
On-task behavior	Manipulation of and sustained eye contact with task materials, task-oriented body position, and task-relevant parent-child interaction. Its duration is used as a behavioral measure of sustained attention.

sions and performed the same tasks. However, instead of providing feedback to the parent, information about the child's problems and development was gathered. Treatment and control parents attended 100% of the scheduled in-clinic sessions.

Results

Data Analysis

A series of 2×3 (Group \times Assessment) repeated measures multivariate analyses of variance (MANOVAs) were used to as-

sess treatment effects on the three sets of outcome variables (child compliance variables, nontargeted child behavior variables, and parent behavior variables). Treatment effects were reflected in significant Group \times Assessment interactions. Analyses of variance (ANOVAs) were then conducted on the individual variables within each set of outcome measures. As well, a priori nonorthogonal comparisons of the two groups at the three different times of assessment were performed following the Dunn-Sidak procedure to control for experimentwise error for multiple tests (Kirk, 1982). Given that all hypotheses regarding the treatment effect were directional, one-tailed tests were used.

Child Compliance

The means, standard deviations, and results of the MANOVA and ANOVAs for child compliance measures are presented in Table 3. Table 4 presents a summary of the paired comparisons. The MANOVA on the two child compliance measures revealed a significant interaction effect (Table 3). A subsequent ANOVA indicated a highly significant treatment effect for percentage of compliance. The treatment group improved steadily over time, whereas the control group remained relatively stable across assessments. Paired comparisons confirmed the statistical significance of the group differences at both posttreatment and follow-up.

In order to elucidate the nature of this treatment effect, the three component behaviors of percentage of compliance were examined. As shown in Table 5, both treatment and control group means for frequency of compliance showed slight declines over time. The frequency of alpha commands followed a similar trend. In contrast, the pattern for frequency of beta commands differed for treatment and control groups. Whereas the mean for the control group showed a moderate steady decline across assessments, the frequency of beta commands for the treatment group dropped at posttreatment to less than half the level at pretreatment. This decrease was maintained at follow-up. These descriptive data suggest that the treatment effect for percentage of compliance was mainly due to decreases in parental use of beta commands.

The ANOVA for frequency of noncompliance yielded a significant Group \times Assessment interaction ($p = .056$) after a Greenhouse-Geisser adjustment was made to account for a violation of the sphericity assumption (Table 3). Paired comparisons revealed no significant group differences at posttreatment or follow-up (Table 4). However, examination of the group means across assessments indicated that noncompliance among treatment group children at the pretreatment assessment was substantially higher, albeit nonsignificantly, than control group children. Furthermore, the treatment group mean declined sharply across assessments, whereas the control group mean showed only moderate decline. In order to determine if the changes within each group were significant, post hoc analyses using Tukey's HSD test were performed. For the treatment group, there was a significant decline in noncompliance from pre- to posttreatment, $q(6, 22) = -5.09, p < .05$, and from pretreatment to follow-up, $q(6, 22) = -4.45, p < .05$. No significant changes from pretreatment were found for the control group.

Table 3
Descriptive Statistics and Group × Assessment Interactions for Child Compliance and Parent Behavior Variables

Variable	Assessment						Treatment effect (Group × Assessment interaction) <i>F</i> (2, 88)
	Pre		Post		Follow-up		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Child compliance							
Percentage of compliance ^a							
Treatment	42.4	10.5	58.1	9.3	60.0	9.5	12.29*
Control	42.3	9.3	43.6	10.9	44.4	10.6	
Frequency of noncompliance							
Treatment	8.0	6.7	3.7	3.2	3.2	2.6	3.19 ^b
Control	6.0	3.7	5.0	3.9	4.7	3.0	
Parent behavior							
Percentage of alpha commands ^a							
Treatment	45.8	9.5	60.4	8.6	62.5	9.3	12.66*
Control	45.3	9.9	46.4	11.7	47.1	10.3	
Percentage of child compliance reinforced ^c							
Treatment	25.2	8.3	33.9	10.9	34.2	10.2	5.16*
Control	25.6	10.5	27.8	8.4	25.9	10.5	
Percentage directive ^{d,e}							
Treatment	64.6	7.8	44.1	8.5	44.1	8.2	43.01*
Control	62.4	5.7	58.4	6.9	57.1	4.9	
Percentage positive ^d							
Treatment	26.4	9.1	48.3	10.2	47.9	10.1	45.42*
Control	27.2	8.8	30.6	9.1	31.6	7.7	
Percentage negative ^d							
Treatment	9.0	3.6	7.6	4.8	8.0	3.8	2.06
Control	10.4	5.7	11.0	4.8	11.3	6.0	

Note. Multivariate analysis of variance (MANOVA) results for child compliance variables; $F(4, 174) = 5.95$, $p < .001$. MANOVA results for parent behavior variables; $F(10, 168) = 7.91$, $p < .001$.

^a Relative to total commands. ^b Greenhouse-Geisser adjusted $df = 1.66, 72.92$; $p = .056$. ^c Relative to total child compliance. ^d Relative to total parental behaviors. ^e Commands and questions.

* $p < .01$.

Data on the criterion for clinical improvement are presented in Table 6. Significantly more treatment families than control families met the criterion for clinical improvement at posttreatment, follow-up, and both posttreatment and follow-up.

Nontargeted Child Behaviors

The MANOVA on the three nontargeted child behavior variables failed to yield a significant treatment effect.

Parent Behavior Variables

The means, standard deviations, and results of the MANOVA and ANOVAs for parent behavior variables are presented in Table 3. Table 4 presents a summary of the paired comparisons. The MANOVA revealed a significant interaction effect. Subsequent ANOVAs indicated significant treatment effects for all the variables with the exception of percentage of negative behavior.

For percentage of alpha commands, the mean for the treatment group rose from pre- to posttreatment and was main-

tained at follow-up. In contrast there was virtually no change across time in the control group mean, which was comparable to the treatment group mean at pretreatment. Paired comparisons confirmed the statistical significance of the group differences at both posttreatment and follow-up. Examination of group means (Table 5) suggests that this change in percentage of alpha commands was accomplished by a decrease in the frequency of inappropriate (beta) commands among the treatment group, with little change in the frequency of appropriate (alpha) commands.

For percentage of compliance reinforced, the mean for the treatment group rose from pretreatment to follow-up. The mean for the control group remained unchanged at a level comparable to that of the treatment group at pretreatment. Paired comparisons yielded a significant group difference at follow-up.

Analyses further revealed a significant change in parental style of interaction among treatment group parents. Parental style of interaction was comparable for treatment and control parents at pretreatment and was characterized by a high percentage of directive behavior (pooled mean = 63.5%), followed

Table 4
Summary of Paired Comparisons

Variable	Between-groups comparison <i>tDS</i>		
	Pre	Post	Follow-up
Child compliance			
Percentage of compliance ^a	0.04	4.90**	5.28**
Frequency of noncompliance	1.66	-1.08	-1.19
Parent behavior			
Percentage of alpha commands ^a	0.05	4.79**	5.30**
Percentage of child compliance reinforced ^b	-0.13	2.11	2.85*
Percentage directive ^{c,d}	1.08	-6.83**	-6.15**
Percentage positive ^c	-0.32	6.53**	6.00**
Percentage negative ^c	-0.97	-2.33*	-2.34*

Note. *tDS* = *t* statistic used with Dunn-Sidak procedure, *C* (number of contrasts) = 3, *df* (for the two error terms) = 44, 88, one-tailed test.

^a Relative to total commands. ^b Relative to total child compliance. ^c Relative to total parental behaviors. ^d Commands and questions.

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

by a substantially smaller percentage of positive behavior (pooled mean = 26.8%). Negative behavior (pooled mean = 9.7%) contributed the smallest proportion. Following treatment there was a decrease in the percentage of directive behavior among treated parents. Treatment and control groups differed significantly at both posttreatment and follow-up. At the same time, there was an increase in percentage of positive behavior among treatment group parents, with significant group differences again obtained at posttreatment and follow-up.

Thus for the treatment group, positive interaction made up proportionately more of parental interaction following treatment than did directive behavior, and this more positive pattern of interaction was maintained at follow-up. In contrast, style of interaction for the control group remained relatively unchanged across assessments, with directive behavior constituting the major portion of parent-child interaction.

Discussion

The results of the present study, based on objective behavioral data, provide support for the efficacy of group parent-mediated

behavioral intervention for the modification of noncompliant behavior in ADDH preschoolers. As such, group parent training may be particularly responsive to the specific needs of ADDH children and their parents during the preschool period, when noncompliance is acute and parental stress is at a peak. However, reliance solely on in-clinic evaluations to evaluate outcome and the failure to find generalization to nontargeted child behaviors underscore the need for further development and evaluation of early intervention programs for ADDH preschoolers.

On each measure of compliance, the treatment group showed significant gains, whereas the control group did not change over time. Moreover, positive outcome was obtained on a criterion measure of clinical improvement. While child noncompliance showed moderate improvement subsequent to treatment, the most noted gains were made on the parent-child interaction variable, percentage of compliance, which reached 60% at follow-up. This level of compliance suggests a normalizing effect of treatment (Forehand, 1977) and represents the criterion cutoff used at pretreatment to distinguish between clinical and normal levels of noncompliance. Examination of the component behaviors of percentage of compliance suggested that improvement on this measure largely reflected the marked decrease in the frequency of parent beta commands. This finding is consistent with the underlying hypothesis that improvement in child compliance would be mediated through parents' improved behavior management skills, and it replicates the finding of Peed et al. (1977). The decrease in beta commands also resulted in the significant increase in the percentage of appropriate commands issued by parents. Improved management skills were further reflected in treated parents' more consistent reinforcement of their children's compliance. Thus, consistent with the goal of therapy, parents effectively learned a complement of skills that resulted in improved compliance in their youngsters.

Benefits of treatment were also indicated in changes in parental interaction characterized by increases in positive interaction and decreases in directiveness. This finding is consistent with other parent training outcome studies (Forehand & King, 1977; Pollard et al., 1983) and has been found subsequent to pharmacological treatment of ADDH children (Barkley & Cunningham, 1979).

Maintenance of treatment effects was found at 3-month fol-

Table 5
Descriptive Statistics on Component Behaviors of Percentage of Compliance

Variable	Assessment					
	Pre		Post		Follow-up	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Frequency of child compliance						
Treatment	106.3	34.8	94.5	30.1	92.9	30.1
Control	103.7	45.1	90.3	42.9	85.7	43.5
Frequency of alpha commands						
Treatment	114.3	33.6	98.3	30.1	96.1	29.4
Control	109.7	44.4	95.3	43.3	90.3	43.6
Frequency of beta commands						
Treatment	144.2	61.4	67.0	27.5	62.7	31.4
Control	150.7	96.3	131.2	99.0	108.0	70.9

Table 6
 Percentage and Number of Children in Each Group Meeting
 Criterion for Clinical Improvement

Assessment	Treatment group		Control group		$\chi^2(1, N = 46)$
	%	No.	%	No.	
Post					
Improved	56.5	13	4.3	1	12.4*
Not improved	43.5	10	95.7	22	
Follow-up					
Improved	60.9	14	17.4	4	7.4*
Not improved	39.1	9	82.6	19	
Post and follow-up					
Improved	47.8	11	4.3	1	9.1*
Not improved	52.2	12	95.7	22	

Note. Criterion for clinical improvement was a minimum 50% increase in percentage of compliance to total commands during the criterion compliance task.

* $p < .01$.

low-up and replicates Forehand and King's work (1977) comparing families in individual parent training with a normal control group.

Although short-term maintenance of treatment effects was found, generalization effects were less evident. The failure to assess setting generalization from clinic to home is a major limitation of the present study. Parent homework assignments indicated improvements in the home setting. However, more rigorous assessment of setting generality is needed to confirm these data. Theoretically a major advantage of parent-mediated intervention is the opportunity for generalization to any context in which parents have a major influence. Research findings have found generalization of parent training treatment effects from clinic to home (Peed et al., 1977; Forehand, Rogers, McMahon, Wells, & Griest, 1981), but generalization to the school setting is inconsistent (Forehand, Breiner, McMahon, & Davies, 1981; McMahon & Davies, 1980).

Evidence of generalization of treatment effects to nontargeted child behaviors was not obtained in the present study. Findings from other studies utilizing a variety of parent training procedures have yielded mixed results with respect to behavioral generalization to child deviant behaviors not specifically targeted in treatment (Forehand & Atkeson, 1977; Wells, Forehand, & Griest, 1980). This suggests that formal training in generalization may be necessary to ensure wider application of compliance training skills. Furthermore, certain behaviors may be more amenable to behavioral intervention than others.

Consistent with our own findings, outcome research in parent training has typically found that parent-targeted intervention has greater impact on parent behavior than on child behavior (Pollard et al., 1983; Webster-Stratton, 1984). In addition, rapid maturation can mask treatment effects. Our own data regarding changes over time in control and treatment group child behavior are consistent with developmental studies that characterize the preschool period as one of major changes in attention span (Levy, 1980), impulsivity (Paulsen & Johnson, 1980), and activity level (Routh, Schroeder, & O'Tuama, 1974). Further research is needed to determine if parent-mediated behavioral intervention can address the multiple behavior problems and at-

tentional deficiencies of ADHD preschoolers, in addition to noncompliance.

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