CASE STUDIES AND CLINICAL REPLICATION SERIES

Predictors of Treatment Outcome in Parent Training for Conduct Disordered Children

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Thirty-four families with conduct disordered children attended a 9-week behaviorally oriented parent-training program. Prior to treatment, mothers were assessed in terms of socioeconomic variables, depression, attitudes towards their children, and behavioral observations in the home. Treatment outcome was assessed at 1 month and 1 year posttreatment using a clinical replication analysis, and included home visit observations and parent perception measures. The amount of negative life stress experienced by families was also assessed for the period prior to and the year following treatment. At the 1-year follow-up, the model consisting of both socioeconomic disadvantage and negative life stress correctly classified from 70 to 80% of families depending on the outcome criteria. Within the variable of socioeconomic disadvantage, coming from a single parent family seemed most strongly associated with nonresponse. Results are discussed in relation to the important predictors of treatment failure and the implications for parent training programs and future research.

Several literature reviews (Berkowitz & Graziano, 1972; Johnson & Katz, 1973; Moreland, Schwebel, Beck, & Wells, 1982) have presented an impressive range of studies indicating that conduct problem children improve following parent training programs. For example, in one major study of 27 socially aggressive boys, Patterson (1974) reported that for 75% of the cases there was an average 60% reduction in deviant child behaviors from baseline to termination. On another criterion, that of

parent daily reports, two-thirds of the families reported a significant drop in the behavior problems for which they were originally referred. Follow-up data indicated that these treatment gains were maintained over a 1-year period during which "booster-shot" therapy sessions were administered as necessary. Other group design studies with conduct problem children have also reported success in reducing deviant child behavior immediately posttreatment (Forehand & Atkeson, 1977; Herbert & Iwaniec, 1981; Pied, Roberts, & Forehand, 1977) and have indicated that the treatment gains were maintained on follow-up (Forehand, Sturgis, McMahon, Aguar, Green, Wells, & Breiner, 1979; Patterson & Fleischman, 1979). However, in contrast to these findings, other investigators have found that differential results were obtained posttreatment depending on the dependent variables under consideration. For example, several studies have reported significant changes in parent report measures, accompanied by nonsignificant changes in child behavioral data collected by independent observers (Atkeson & Forehand, 1978; Bernal, Klinnert, & Schultz, 1980; Eyberg & Johnson, 1974; Johnson & Christensen, 1975). Moreover, still other studies have reported that the immediate posttreatment gains were not maintained on follow-up assessments (Ferber, Keeley, & Shemberg, 1974; Johnson & Christensen, 1975; Kent & O'Leary, 1976; Wahler, 1980).

These conflicting findings have caused some investigators (Greist & Wells, 1983; Reid & Patterson, 1976; Wahler & Graves, 1983) to begin to examine why parent training programs may work for some families and not for others. While reliable predictors of success and failure of treatment for families have yet to be substantiated, there are suggestions that the family's ability to cope with the conduct disordered child and to benefit from parent training may be influenced by factors such as the parents' cognitive, psychological, and marital adjustment as well as socioeconomic status (Griest & Wells, 1983).

Only a few studies have examined the relationship between these family variables and outcome of parent training. Several investigations have revealed that parent psychological and cognitive factors may be responsible for success or failure in parent training. Pretreatment levels of parental depression (Beck Depression Inventory) and anxiety (State-Trait Anxiety Inventory) were found to be significantly related to treatment failure and dropout during therapy and during followup (Griest, Forehand, & Wells, 1981; McMahon, Forehand, Griest, & Wells, 1981). Parent cognitive factors, that is, parents' perceptions of their children's behavior, were also found to be related to treatment outcome and maintenance. Wahler and Afton (1980) determined that those parents who continued to have negative perceptions of their children's behavior posttreatment failed to maintain positive behavioral treatment effects.

Other studies have examined the relationship between marital status, marital discord, and treatment outcome. Reisinger, Frangia, and Hoffman (1976) found treatment failure connected to marital problems. On the other hand, Oltmanns (1977) found no relationship between treatment

outcome and marital satisfaction. Strain, Young, and Horowitz (1980) found that single parent families were more likely to drop out of parent training than intact families. Strain (1980) also found that intact families were more successful in maintaining treatment effects than single parent families.

Wahler (1980) and Wahler and Afton (1980) found that socioeconomically disadvantaged families did not fare well in parent-training programs. Socioeconomic disadvantage was defined by these authors in terms of low income, low education, single parent family, poor area of residence, large number of children in family and referral by outside agency. More recently Dumas and Wahler (1983) described a model whereby socioeconomic disadvantage coupled with insularity or social isolation resulted in a steady increase in the probability of treatment failure. Reid and Patterson (1976) and McMahon, Forehand, Griest, and Wells (1981) also reported that those families who dropped out of treatment were more likely to be of low socioeconomic status.

Moreover, there are a number of other factors which presumably could intervene in treatment outcome effects. In line with Wahler's social model, it could be hypothesized that the degree of life crisis and environmental stresses (for example, moving to a new neighborhood, death in family, unemployment) would be significantly related to a family's ability to maintain treatment effects.

In the past there has been a tendency to define the conduct disordered child's family as a closed and static system with the primary focus on changing the parents' deficit in parenting skills. Recently a few researchers have begun to examine more broadly the complex interplay of other family variables and how they relate to the treatment of children with conduct disorders. However, this research is scarce and limited to a single outcome measure such as reduction in child deviancy. Since in many cases it is the parents' perceptions and behaviors that are deviant, then it seems important to assess more than a single child outcome variable.

The purpose of this study was to define predictor variables which are related to treatment success or failure for families of conduct disordered children. Moreover, treatment outcome success or failure was determined in terms of parent behavior and attitude change as well as child behavior change. Understanding the relationship of family and social variables to treatment outcome makes it possible to examine the benefits of adding other treatment components to parent training programs.

METHOD

Subjects

Subjects were recruited from a psychiatric and behavioral clinic in a local pediatric hospital which announced that it had a specialized program for the treatment and evaluation of conduct problem children. Families were screened during an intake telephone call and offered a clinic appointment if they met the following criteria: (a) The child was between 3

and 8 years old, (b) the child had no debilitating physical impairment, intellectual deficit or history of psychosis, (c) the primary referral problem was conduct disorders[1] (e.g., refusal to follow requests, tantrums, social aggression, and hyperactivity), and (d) parents agreed to home visits and filling out questionnaires. Families were subsequently interviewed in the clinic by a psychologist or social worker and were offered the research treatment program if the parents perceived their children as having a clinically significant number of behavior problems according to the Eyberg Child Behavior Inventory (ECBI) (Eyberg & Ross, 1978), or if an outside professional referral had been made for aggression and noncompliance. No formal psychological testing was carried out with the children themselves. Children were excluded from the study if they were obviously psychotic or retarded or if the families were involved in a child abuse crisis situation and needed immediate assistance. Approximately five families were excluded from the sample for one of these reasons.

Thirty-four families referred by pediatricians, psychiatrists, school or mental health personnel, nurses or by parents themselves took part in the study. Study children included 25 boys and 9 girls, with the mean age of 5 years, 2 months when they started treatment. The mean number of behavior problems pretreatment according to the ECBI was 20.6 ± 7.3, indicating that the children were clearly in the clinic range according to this measure (nonclinic mean 6.8 ± 3.9). Twenty of the 34 children were from father-absent families. The mean age of mothers was 27 years. The average number of children per family was 1.64. Family social class as determined by Hollingshead and Redlich's (1958) Two Factor Index of Social Position was 55.8, indicating the average family was Social Class 4, lower middle to lower class.

VERBAL REPORT MEASURES

Socioeconomic Measures

The sociodemographic variables measured were: family income, maternal education, family composition, and source of referral. Prior to the implementation of any treatment procedure, all mothers completed an interview which provided these measures. (a) Family income referred to all known sources of income (gross) available to the family during the previous year. It was classified into four categories: welfare (less than 5,000), low (5–11,999), middle (12–23,999), or high (from 24,000+). (b) Maternal education referred to the number of years of schooling completed by each participant. It was classified into one of these categories: below high school completion, high school completed, or college education started or completed. (c) Family composition referred to a participant's marital

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[1] Although conduct disorder implies a specific DSM-III classification, the term is used here in a generic sense to denote any child with an acting out or externalizing behavior problem (Achenbach & Edelbrock, 1978). Children were included in the study if they displayed an aggressive disorder or a mixed hyperactive-aggressive disorder, but were not included if they displayed pure hyperactivity without aggression.

status at the time of the initial interview. A family was considered to be a two-parent household (intact) if the mother was married or living with her husband or cohabiting for at least two years. A family was considered a one-parent household if the mother had never been married, was separated or divorced, or had been living away from husband for at least two years. (d) Source of referral described whether a mother was referred by social service agency or professional or whether she was self-referred.

Because these sociodemiographic variables were closely intercorrelated, an index of socioeconomic disadvantage comparable to the index developed by Dumas and Wahler (1983) was constructed. Each family was given a score of 0 or 1 on each descriptive, depending on whether it fell at the advantageous or disadvantageous end of the continuum. On the three descriptors with more than two categories, a family was given a score of 1 if its income was welfare or low, or if the mother had no college education; otherwise it obtained a score of 0. Index scores could range from 0 to 4.

Parental Psychological Measures

Beck Depression Inventory (BDI). The BDI (Beck, 1972) has been shown to correlate significantly with clinicians' ratings of depression (Metcalfe & Goldman, 1965) and with objective behavioral measures of depression (Williams, Barlow, & Agras, 1972). Split-half reliability achieved a Spearman-Brown reliability coefficient of .93.

Parent Perceptions of Child Behaviors

Achenbach Child Behavior Checklist (CBCL) (Achenbach & Edelbrock, 1981). The CBCL consists of 118 behavior problems which measure parents' perceptions of their children's behavior problems. Research comparing parents' reports on 1,300 children referred to mental health agencies with 1,300 randomly selected nonreferred children indicated clinic children had significantly more behavior problems. Intraclass correlations were in the 90s for interparent agreement, 1 week test-retest reliability and inter-interviewer reliability.

Environmental Measures

Life Experience Survey (LES) (Sarason, Johnson, & Seigel, 1978). The LES is a 57-item measure that permits the respondent to assess positive and negative life experiences. It was normed on 345 university students and found to have adequate test-retest reliability (6 week). In addition, the scale has been shown to be related to measures such as anxiety, achievement, maladjustment and depression.

OBSERVATIONAL MEASURES

Home Observations

All families were observed according to the Dyadic Parent-Child Interaction Coding System (DPICS) (Robinson & Eyberg, 1981). The DPICS consists of 29 separate behavior categories covering parent and child

behaviors which are coded as present or absent for each 5-min segment. Since many of these families had only one parent living at home and only one child, only mother/problem child dyadic interactions were analyzed.

From the behavior categories, two separate summary variables were formed for mother behaviors: Total Critical Statements and Physical Negative Behaviors. For the target child behaviors there were two variables: Total Child Deviancy (sum of the frequency of whine + cry + physical negative + smart talk + yell + destructive) and Total Noncompliance Behaviors (defined as failure to respond to a command within 5 sec after the command is issued). These specific behaviors were selected from the DPICS coding system in order to focus on parent and child behaviors which have been shown to discriminate clinic and nonclinic mothers and children (Forehand, King, Reid, & Yoder, 1975; Lobitz & Johnson, 1975; Patterson & Cobb, 1973).

The behavior observations were obtained by making two home visits at each assessment period in which the mother-child dyad was observed for 30 min at each visit. All observations took place in the late afternoon between 4:30 and 7:30 p.m. with all family members present. Home observations were made by trained observers who were blind to the hypotheses of the study. They received extensive training initially and then ongoing weekly training sessions and practice of videotaped interactions to maintain accuracy. To assess reliability, two observers were used on approximately 50% of all observations. Reliability was calculated in two ways: the ratio of number of agreements to total number of agreements and disagreements and Pearson product-moment correlations between ratings for each separate behavior category. The percent agreement reliability was calculated for each 5-min segment and was based only on occurrences of behavior noted, not nonoccurrence. Mean overall interrater reliability was 78.6%. For the two mother behavior categories, physical negative and critical statements, the product-moment correlations calculated between observers were .98 and .78 respectively, and for the two child behavior categories the correlations were .91 and .89.

PROCEDURES

Prior to the onset of parent training, data were collected for each family in regard to socioeconomic variables, parent perceptions, psychological variables, and behavioral observations. After 3 to 4 weeks of baseline data collection, 34 families received parent training which consisted of a series of nine 2-hr weekly training sessions. The training regimen is outlined in Table 1. In summary, the first 4 weeks of the treatment program included a modification of the interactional model (Hanf & Kling, 1973) focusing on positive interactional and play skills. The last 5 weeks focused on teaching parents a specific set of operant techniques such as principles of praise, ignoring, giving commands, and Time Out for child noncompliance and destructive behaviors. A more complete description of the training program is available from the author. Mothers attended an average of 8.8 (± 1.1) treatment sessions and 15.9 hr of therapy. Two families

TABLE 1
PARENT TRAINING PROGRAMS FOR CONDUCT PROBLEM CHILDREN[a]

Week number	Description	Homework assignment
1	Training on play interaction skills[b]	Play 5 min per day with child
2	Training on play interaction skills	Count praises given to child for 2 hr
3	Training on use of social reinforcement	Double number of praises given to child
4	Training on use of tangible rewards	Set up star or point system with child
5	Training on use of distraction and ignore	Choose one behavior to systematically ignore
6	Training on use of time-out for noncompliance[c]	Reduce commands to child
7	Training on use of time-out and other punishments for destructive behaviors (e.g., response cost, logical consequences)	Start use of time-out
8	Review and training on use of problem solving approaches	
9	Catch-up and review	

[a] Manual and more complete description of treatment program available from author.
[b] Play Interaction Treatment as described by Hanf and Kling (1973).
[c] Compliance training as described by Forehand and McMahon (1981).

dropped out after only two treatment sessions and the remaining 32 families attended at least 70% of treatment sessions. Treatment outcome was then assessed twice, at 1 month and 1 year posttreatment, and included two home visit observations, all the parent report measures at each assessment period, and the life experience survey at the 1-year follow-up. Only 1 of the 32 families that completed therapy did not return for the 1-year follow-up assessment.

Treatment Outcome

Families were classified as favorable "responders" or "nonresponders" to treatment on the bases of four different outcome criteria: (a) child behaviors, (b) parent perceptions of child behaviors, (c) parent behaviors, and (d) a combination of parent and child behaviors. The two families that dropped out of treatment were automatically classified as nonresponders. For the first child behavior outcome criterion, total child deviancy and child noncompliance had to be reduced 50% from baseline at posttreatment assessments. The decision to use this child criterion was based on previous studies with conduct disordered children which have reported 30% to 50% reduction in child deviancy as an indicator of treatment success (Dumas & Wahler, 1983; Patterson, 1974). For the parent

behavior outcome criterion, in order to be classified as a responder, mother total criticism and physical negative behaviors toward their children had to be reduced 50% from baseline at posttreatment assessments. Since parent praise behaviors have not been shown to discriminate clinic-referred and nonclinic families these positive behaviors were not included in the classification criteria for mother responders and nonresponders (Forehand, King, Reid and Yoder, 1975; Lobitz & Johnson, 1975). For the parent perception outcome criterion, in order to be classified as a responder, mothers had to report a score lower than 43 on the CBCL Total Behavior Problem Score. This cutoff score was employed because Achenbach and Edelbrock (1981) have reported this score as the highest cutoff point between normalcy and deviancy (90th percentile). Only two of the subjects were slightly below this cutoff score prior to treatment (mean pretreatment 67.6 ± 26.8). Finally, a combined parent and child behavior outcome criterion, which has been described recently by Dumas and Wahler (1983), was used in an attempt to replicate their findings. For this outcome criteria total child deviancy and child nomcompliance had to be reduced 50% from baseline at posttreatment assessment. In addition, mother criticism and physical negative behaviors toward their children had to be reduced 50% from baseline measures. The mother and child dyad had to meet both these outcome criteria in order to be classified as responders to treatment.

RESULTS

Analyses of data initially consisted of the following preplanned comparisons: (a) Pretreatment vs Immediate Posttreatment, (b) Pretreatment vs 1-Year Follow-up, and (c) Immediate Posttreatment vs 1-Year Follow-up. Paired t tests were performed to describe changes over these time periods. For each dependent variable the Dunn-Bonferonni tables were used to determine the critical values in order to correct for the number of individual comparisons. Table 2 presents the mean scores and standard deviations at baseline, immediate posttreatment and 1-year follow-up for each of the dependent variables for the entire samples. Table 3 then presents a more detailed picture of the characteristics of those families that were classified as responders or nonresponders at the 1-year follow-up.

Child Behavior Outcome Criterion

Immediately posttreatment there was a significant reduction in child noncompliance, $t(31) = 4.01$, $p < .001$, and total child deviancy, $t(31) = 4.74$, $p < .001$. Based on the criteria that child deviancy and noncompliance each had to be reduced 50% from baseline in order to be classified as a responder, there were 18 children (55%) who were responders and 16 (45%) who were nonresponders. These child behavior improvements were maintained 1 year later, in fact, child noncompliance and deviancy continued to show significant reductions from immediate posttreatment to 1-year follow-up assessment, $t(30) = 2.71$, $p < .01$ and $t(30) = 3.33$,

$p < .002$ respectively. At the 1-year follow-up, 27 children (79%) were classified as responders to treatment and 6 remained unfavorable responders.

As can be seen in Table 5, at the 1-year follow-up there were 6 child nonresponders and all of these had single parents and came from families with a significantly higher index of socioeconomic disadvantage and a lower negative life change score than the child responders. The mothers of these nonresponder children were also observed to be significantly more negative in their interactions with them. However, they did not report their children as being more deviant than mothers of the responder children.

Mother Behavior Outcome Criterion

Immediately posttreatment there was a significant reduction in mother critical behaviors, $t(31) = 3.61$, $p < .001$. Based on the criteria that both mother critical statements and physical negative behaviors had to be reduced 50% from baseline in order to be classified as a responder, there were 22 mothers (65%) who were responders to treatment at both the immediate and 1-year follow-up assessments. As Table 4 indicates, all but one of the 11 mothers who were nonresponders were single parents. Compared to mother responders they had a higher index of socioeconomic disadvantage and a lower negative life change score. It is also noteworthy that their children were observed by the raters to be somewhat more deviant and noncompliant than the children of the responder mothers.

Mother Perception Outcome Criterion

Mothers reported significantly fewer child behavior problems on the CBCL immediately posttreatment, $t(31) = 12.61$, $p < .001$, and at the 1-year follow-up, $t(30) = 8.76$, $p < .001$, compared to baseline. Based on the criterion that the mothers had to report a score lower than 43 on the CBCL in order to be classified as a responder, there were 19 mothers (56%) who were responders at the immediate posttreatment assessment and 21 mothers (64%) who were favorable responders 1 year later. For the 12 mothers who remained nonresponders at the follow-up the only significant difference from the responders other than the CBCL was that they had reported significantly higher negative life change scores.

Combined Mother and Child Behavior Outcome Criterion

Based on the more stringent outcome criteria that child deviancy and noncompliance behaviors as well as mother criticism and physical negative behaviors had to each be reduced 50% from baseline measures, there were 14 mother-child dyads (41%) who were responders to treatment immediately posttreatment and 21 dyads (64%) who were favorable responders at the 1-year follow-up. Again, Table 4 indicates that for the 12 nonresponder dyads, all but one was a single parent family and had a higher index of socioeconomic disadvantage as well as a lower negative life change score.

TABLE 2
COMPARISON OF MOTHERS' ATTITUDES AND MOTHER-CHILDREN INTERACTIONS AT
BASELINE, IMMEDIATELY POSTTREATMENT AND ONE YEAR LATER

	Pretreatment		Immediate posttreatment		1-year follow-up	
Variables	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Mother reports						
Achenbach total behavior problem score	64.31 ± 28.6		40.97 ± 23.7†††		35.35 ± 21.7***	
Mother behaviors						
Critical statements	13.23 ± 13.4		6.05 ± 5.4†††		5.34 ± 5.1***	
Physical negative	1.45 ± 1.7		1.06 ± 2.0		.85 ± 3.4	
Child behaviors						
Noncompliance	6.08 ± 4.5		2.94 ± 2.6†††		1.87 ± 2.3***	
Deviance	12.64 ± 11.2		4.64 ± 5.5†††		1.66 ± 2.3***	

††† $p < .001$. Comparison of immediate posttreatment with pretreatment scores.
*** $p < .001$. Comparison of 1-year follow-up with pretreatment scores.

Prediction of Treatment Outcome

The major results of this study show that over half of the families were helped subtantially, according to several outcome criteria, by a parent-training program. Moreover, these attitude and behavior changes were maintained or improved 1 year posttreatment. Thus, this report is consistent with other studies which have reported the success of parent-training programs (Dumas & Wahler, 1983; Forehand & Atkeson, 1977; Patterson, 1974). The final purpose of this study was to determine which predictor variables or combination of variables were related to treatment response or nonresponse.

The three predictor variables assessed were as follows:

(a) Mother Depression
(b) Index of Socioeconomic Disadvantage: comprised of education, income, marital status and referral status
(c) Life Experience Survey: number of negative life experiences over year preceding and following treatment

The three independent predictor variables were entered into a forward stepwise discriminant function analyses in the order of their reduction of the Wilk's lambda in relation to the criteria of responder and nonresponder at the two posttreatment assessments. Table 4 gives the discriminant analyses results for the responder/nonresponder comparison, separately for each of the four outcome criteria, immediate posttreatment, and Table 5 gives these analyses for the four outcome criteria at the 1-year follow-up. Only those variables which formed a significant function (at

$p < .05$) were listed, in order of their entry into the function. The two cases that dropped out of treatment were not included in the analysis phase but were included as nonresponders in the classification phase of the discriminant function analysis. The tables also include the simple correlations of each predictor with the criterion, canonical correlation, and the total percentage of variance accounted for at each step. One note of caution to the reader is that the classification results were undoubtedly inflated by sampling error since they were based on the sample used to generate the equation, not a cross validation sample.

For the child behavior outcome criteria at the immediate posttreatment assessment, the discriminant function based on two predictors was significant, $F(2, 28) = 3.44, p < .04$. These were: (a) Index of Socioeconomic Disadvantage, and (b) Negative Life Experience Score. Nonresponders to treatment tended to have higher socioeconomic disadvantage and lower negative life change. This model accounted for 20% of the variance. However, the variable, Index of Socioeconomic Disadvantage, contributed a significant amount of unique variance (15%). At 1-year follow-up, the discriminant function based on the same two predictors was also significant, $F(2, 28) = 4.65, p < .01$. This model accounted for 25% of the variance with each variable contributing an equal amount of unique variance. Moreover, the model consisting of these two predictors correctly classified 27 out of 33 families (81.8%).

For the mother behavior outcome criterion at the immediate posttreatment assessment, the discriminant function based on one predictor, Index of Socioeconomic Disadvantage, was not quite significant, $F(1, 29) = 3.25, p < .08$. At the 1-year follow-up, the discriminant function based on two predictors was significant, $F(2, 28) = 4.87, p < .01$. These were: (a) Negative Life Experience Score, and (b) Index of Socioeconomic Disadvantage. Nonresponders to treatment tended to have lower negative life change and higher socioeconomic disadvantage. This model accounted for 26% of the variance with each variable contributing an equal amount of variance. The model consisting of these two predictors correctly classified 24 of 33 families (72.7%).

For the mother perception attitude outcome criterion at the immediate posttreatment assessment, the discriminant function based on one predictor was significant, $F(1, 29) = 6.87, p < .01$. This predictor was the Negative Life Experience Score and accounted for 19% of the variance. At the 1-year follow-up, the discriminant function based on the same predictor was highly significant, $F(1, 29) = 14.9, p < .0006$. This predictor model accounted for 34% of the variance. At both assessments the nonresponders to treatment tended to have higher negative life change scores.

For the mother and child behavior outcome criterion at the immediate posttreatment assessment, the discriminant function based on one predictor, Index of Socioeconomic Disadvantage, was not quite significant, $F(1, 29) = 3.65, p < .06$. At the 1-year follow-up, the discriminant function analysis based on two predictors was significant, $F(2, 28) = 6.95, p <$

TABLE 3
DEMOGRAPHIC VARIABLES AND MEAN SCORES OF PREDICTORS AND OUTCOME CRITERIA FOR RESPONDERS AND NONRESPONDERS AT 1-YEAR FOLLOW-UP

	Child behavior outcome		Mother behavior outcome		Mother attitude outcome		Mother and child behavior outcome	
	R (n = 27)	NR (n = 6)	R (n = 22)	NR (n = 11)	R (n = 21)	NR (n = 12)	R (n = 21)	NR (n = 12)
Demographic variables								
Mean age of child (months)[d]	58.7 (17.9)	62.3 (21.7)	56.1 (15.6)	65.7 (22.3)	59.6 (19.1)	58.8 (17.6)	55.7 (15.8)	65.7 (21.2)
Sex of child[a]								
Male	20	4	16	8	15	9	16	8
Female	7	2	6	3	6	3	5	4
Mean social position score[b,c]	50.5 (14.2)	58.0 (9.7)	49.8 (14.7)	56.0 (10.6)	50.8 (12.2)	53.7 (16.2)	49.3 (14.9)	56.4 (10.2)
Marital status[a]								
Single	12	6	8	10	11	7	7	11
Married or cohabiting	15	0	14	1	10	5	14	1
Predictors[d]								
Index of socioeconomic disadvantage[c]	2.1 (1.4)	3.0 (.63)	2.0 (1.3)	2.8 (1.2)	2.2 (1.4)	2.5 (1.2)	2.0 (1.3)	2.8 (1.1)
Beck depression score	12.0 (9.4)	11.5 (11.9)	11.1 (9.9)	13.5 (9.6)	10.8 (9.9)	14.0 (9.3)	11.7 (9.8)	12.4 (9.9)

Note. R = responder; NR = nonresponder.
[a] Reflects actual numbers of cases.
[b] Based on Hollingshead and Redlich's (1958) Two Factor Index of Social Position (education and occupation).
[c] Minimum and maximum range of score possible 0–4.
[d] Means and numbers in parentheses are standard deviations.

TABLE 3
CONTINUED

	Child behavior outcome		Mother behavior outcome		Mother attitude outcome		Mother and child behavior outcome	
	R (n = 27)	NR (n = 6)	R (n = 22)	NR (n = 11)	R (n = 21)	NR (n = 12)	R (n = 21)	NR (n = 12)
Negative life change score	7.6 (6.8)	.25 (.50)	8.2 (7.1)	2.8 (4.1)	3.9 (4.6)	12.3 (7.4)	8.6 (7.0)	2.5 (4.0)
Outcome criteria 1 year posttreatment[d]								
Achenbach child behavior inventory	37.0 (22.1)	24.3 (16.9)	38.6 (23.9)	27.4 (12.9)	24.8 (12.2)	57.6 (20.8)	38.4 (24.5)	29.0 (13.1)
Mother critical statements	4.6 (4.2)	10.0 (8.9)	3.4 (3.2)	10.1 (6.0)	4.9 (5.2)	6.3 (5.2)	3.4 (3.3)	9.4 (6.1)
Mother physical negative behaviors	.28 (.86)	4.7 (9.2)	.06 (.23)	2.8 (6.1)	1.0 (4.0)	.50 (1.3)	.07 (.24)	2.5 (5.8)
Child noncompliance	1.5 (1.5)	4.6 (4.4)	1.2 (1.4)	3.5 (3.1)	1.8 (2.4)	1.9 (1.9)	1.2 (1.5)	3.4 (2.9)
Child deviance	1.4 (2.1)	3.6 (2.7)	1.4 (2.3)	2.2 (2.3)	1.1 (1.7)	2.7 (2.9)	1.3 (2.2)	2.4 (2.3)

Note. R = responder; NR = nonresponder.
[a] Reflects actual numbers of cases.
[b] Based on Hollingshead and Redlich's (1958) Two Factor Index of Social Position (education and occupation).
[c] Minimum and maximum range of score possible 0–4.
[d] Means and numbers in parentheses are standard deviations.

TABLE 4
PREDICTORS OF TREATMENT RESPONSE FROM DISCRIMINANT FUNCTION ANALYSES AT IMMEDIATE POSTTREATMENT

Outcome criterion	Predictors	Simple correlation with criterion	Increment in criterion variance accounted for (%)	Canonical correlation	Number of		% Correctly classified	F	Significance
					Responders n (%)	Non-responders n (%)			
Child behavior outcome	ISED[b]	.41**	15.08	.44	18 (55)	16 (45)	70.6	3.44	.04
	NLES[a]	−.16	4.66						
Mother behavior outcome	ISED	.33*	10.89	.32	22 (65)	12 (35)	67.6	3.25	.08
Mother perception outcome	NLES	.44**	19.36	.44	19 (56)	15 (44)	55.9	6.87	.01
Combined mother-child behavior outcome	ISED	.36*	12.1	.33	14 (41)	20 (59)	65.0	3.65	.06

[a] NLES = Negative life experiences score.
[b] ISED = Index of socioeconomic disadvantage.
* $p < .05$. ** $p < .01$.

TABLE 5
PREDICTORS OF TREATMENT RESPONSE FROM DISCRIMINANT FUNCTION ANALYSIS AT 1-YEAR FOLLOW-UP

Outcome criterion	Predictors	Simple correlation with criterion	Increment in criterion variance accounted for (%)	Canonical correlation	Number of Responders n (%)	Number of Non-responders n (%)	% Correctly classified	F	Significance
Child behavior outcome	NLES[a] ISED[b]	−.37* .28	13.52 11.41	.50	27 (79)	6 (21)	81.8	4.65	.01
Mother behavior outcome	NLES ISED	−.37* .29*	13.65 12.14	.51	22 (67)	11 (33)	72.7	4.87	.01
Mother perception outcome	NLES	.58***	34.0	.58	21 (64)	12 (36)	70.0	14.9	.0006
Combined mother-child behavior outcome	NLES ISED	−.43** .32*	18.26 14.90	.58	21 (64)	12 (36)	72.7	6.95	.004

[a] NLES = Negative life experiences score.
[b] ISED = Index of socioeconomic disadvantage.
* $p < .05$. ** $p < .01$. *** $p < .001$.

.004. These were: (a) Negative Life Experience Score, and (b) Index of Socioeconomic Disadvantage. Nonresponders to treatment tended to have lower negative life change and higher socioeconomic disadvantage. This model accounted for 33% of the variance with each variable contributing an equal amount of the variance.

DISCUSSION

The search for reliable predictors which are related to treatment success or failure for families with conduct disordered children is a complex and intriguing task. There are at least three important points to take into consideration: (a) time the posttreatment assessment is carried out, (b) definition of outcome criterion, and (c) nature of the predictors analyzed. First, this study illustrates that depending on whether the family assessment is made immediately posttreatment or 1-year posttreatment results in somewhat different clusters of predictors of treatment success or failure. However, immediately posttreatment the predictors were less accurate and accounted for a smaller percentage of the variance, in comparison to the 1-year follow-up analyses. Perhaps immediately posttreatment it is too early to predict treatment success or failure, for parent attitude change and mother-child behavior change may be a delayed response. In fact, in this study, 41% of mothers and children responded favorably to treatment immediately posttreatment, but at the 1-year follow-up, 64% of mothers and children responded favorably to treatment in terms of the combined mother and child behavior outcome criterion. Thus, the 1-year follow-up analysis seems to provide not only a more stable and a more accurate prediction of responders and nonresponders to treatment, but a better understanding of predictors which affect the durability of treatment effects over time.

Second, not only is the time chosen for the posttreatment assessment important, but the criterion used to define treatment success or failure is a crucial consideration. In this study four different outcome criteria were used to measure treatment success. While it could be argued that a reduction in children's noncompliance and deviance behaviors is the most important outcome criterion, there is still considerable evidence to indicate that in clinic populations there may be some children who are not necessarily more deviant than normal children, but rather it is the mothers' perceptions and behaviors that are more deviant (Rickard, Forehand, Wells, Griest, & McMahon, 1981). In such cases mother perception and behavior change would be an important treatment outcome criterion. This study showed that depending on the definition of treatment outcome criterion, different clusters of predictors of treatment success or failure emerged.

Nonetheless, despite the somewhat different constellations of predictors depending on the time of posttreatment assessment and the outcome criterion used, a number of important findings emerged in relation to specific predictors which contributed significantly more of the unique variance to each of the models. At both the immediate posttreatment

assessment and the 1-year follow-up, the index of socioeconomic disadvantage seemed to emerge as an important predictor for the child behavior and mother-child behavior outcome criteria, that is, the more disadvantaged the family (single, low income, and low education), the less likely it was to benefit from parent training. The socioeconomic index variable accounted for from 11 to 15% of the variance for the two child and mother behavior outcome criteria. Further analyses of the components of the index of socioeconomic disadvantage revealed that at the 1-year follow-up significantly ($p < .01$) more of the nonresponders to treatment on the mother and child behavior outcome criteria were from single parent families. There appeared to be minimal difference between responders and nonresponders in terms of income or in terms of Hollingshead and Redlich's (1958) social position score which is based on education and occupation. Therefore, the lack of social support seems to be an important predictor of therapy success or failure. These results correspond to the study by Dumas and Wahler (1983) with an outcome criterion very comparable to the combined mother-child behavior outcome criterion in this study which reported that the socioeconomic disadvantage index accounted for from 7 to 9% of the variance. Moreover, they reported that social isolation coupled with socioeconomic disadvantage improved the predictions of nonresponders to treatment.

Another ecological variable that appeared to contribute a significant amount to the prediction models of all four outcome criteria at the 1-year follow-up assessment was the negative life experience score. This score contributed 34% of the variance to the prediction model for the mother attitude outcome criterion. A high negative life experience score was more associated with nonresponders on this outcome criterion. This finding suggests that those mothers who perceived that they had more negative life stresses over the previous year also had more negative attitudes towards their children's behaviors. These results seemed to support the "coercion process" described by Patterson and Reid (1970) and Wahler (1980) that parents of conduct disordered children get trapped in many different types of negative relationships and life experiences. However, when the negative life experience score was entered in the prediction model for the child behavior, mother behavior and combined mother-child behavior outcome criteria, analysis indicated that a low negative life experience score was associated with nonresponders. This rather surprising finding seems to contradict the theory proposed that high negative life stress would have a detrimental effect on parent-child relationships. However, further analysis of the Life Experience Survey offers some possible explanations. It was found that responders to treatment on the mother and child behavior outcome criterion not only reported more negative life experiences, but also more positive life experiences than nonresponders. In fact, the ratio of positive events reported was greater than the number of negative events reported for responders. The mean positive life experience score for the responders was 10.6 and the mean for the nonresponders was 6.3. Moreover, it was shown that during the year

posttreatment, 45% of responders had moved to a new residence (versus 20% of nonresponders), 50% had experienced a change in financial status (versus 10% of nonresponders), 40% a change in job (versus 10% of nonresponders), 30% had become pregnant again (versus none of non-responders), and 45% a change in recreation and social activities (versus 20% of nonresponders). Thus responders generally had more life experiences than nonresponders and perceived the majority of these changes as positive changes in their lives. It could be hypothesized that for the responders these positive environmental changes would not only ameliorate the stress produced by any negative events, but perhaps even foster the maintenance of treatment in terms of improved mother-child behavior outcomes. Additionally, since it was noted earlier than significantly more of the responders on the three mother and child behavior outcome criteria were married, this social support could also help buffer the effects of negative life stress versus nonresponders who did not have this support and seemed to avoid life experiences in general. Thus, there may be some interaction between types of life experiences and availability of social support.

It is surprising that the mother personality variable, pretreatment depression, was not a better predictor of treatment success or failure. One of the reasons for this finding was perhaps because this variable was highly correlated with the socioeconomic disadvantage index ($r = .45$, $p < .01$) and negative life stress ($r = .41$, $p < .01$) and once these predictors were entered there may have been little variance left to explain. Another possible reason pretreatment depression did not emerge as a more significant predictor was because mother depression decreased significantly from pre- to immediate posttreatment assessment, $t(31) = 4.18$, $p < .0001$, and from pre- to 1-year follow-up assessment, $t(30) = 3.51$, $p < .001$.

In summary, this study seems to illustrate that there is no single predictor that is responsible for treatment success or failure. However, the ecological variables, life experiences and socioeconomic disadvantage, do seem to add a significant amount of variance to the models and accurately classified 70 to 80% of the families at follow-up. In particular, single parent families with their associated economic difficulties and lack of support emerged as a significant predictor of nonresponse to therapy. The practical implications of this for mental health professionals seem to suggest the importance of altering treatment programs not only to include parent training concepts, but also to include ways to obtain social support, and to cope with socioeconomic difficulties and negative life experiences. In addition, it would seem to be important to detect those parents who continue to be depressed posttreatment and to offer them further treatment specifically related to depression management.

One limitation of this study is the small sample size and the number of predictors employed. Moreover, the classification results were undoubtedly inflated since they were based on the sample used to generate the equation and not a cross validation sample. However, this type of research is scarce and still in the earliest hypothesis generating stage. Most

similar studies to date have been conducted with comparable sample sizes (Dumas & Wahler, 1983; Griest, Forehand, & Wells, 1981; McMahon, Forehand, & Wells, 1981; Wahler & Afton, 1980). With respect to the number of predictors investigated in this study, there is a need to identify the variables which may be important in predicting treatment success or failure. The next stage of the research is to use these models to attempt to replicate the findings with larger populations. Little has been known about the interplay of various family and ecological variables and the treatment of conduct disordered children. Research which can help us understand those families that will respond or not respond to treatment and its practical implications for improving treatment programs is sorely needed.

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