

Follow-Up of Children Who Received the Incredible Years Intervention for Oppositional-Defiant Disorder: Maintenance and Prediction of 2-Year Outcome

M. JAMILA REID

CAROLYN WEBSTER-STRATTON

MARY HAMMOND

University of Washington

This paper presents 2-year follow-up data for a sample of 159, 4- to 7-year-old children with oppositional-defiant disorder (ODD) who were randomly assigned to: parent training (PT), parent plus teacher training (PT + TT), child training (CT), child plus teacher training (CT + TT), parent plus child plus teacher training (PT + CT + TT). At the 2-year follow-up, approximately 75% of children were functioning in the normal range according to parent and teacher reports. Twenty-five percent of children were classified as treatment nonresponders at home and/or at school. Teacher training added significantly to long-term school outcomes for children who had pervasive behavior problems. Baseline, post, and 1-year follow-up parenting practices distinguished between home treatment responders and nonresponders (parents of nonresponders were more critical and less positive). For children with baseline pervasive home-school problems, baseline maternal parenting and posttreatment marital discord were associated with poor treatment response at home at the 2-year follow-up. In addition, 80% of pervasive children whose mothers were highly critical immediately posttreatment were classified as school nonresponders at the 2-year follow-up.

This research was supported by the NIH National Center for Nursing Research Grant #5 R01 NR01075-11 and Research Scientist Development Award MH00988-09 from NIMH. The authors are grateful to a number of people who assisted in extensive work related to data collection and data management: Kate Calhoun, Doris Harkness, Karrin Bianchi, Nat Houtz, Susan Reanier, Kathy Rogers, and Aaron Wallis. Special appreciation to Lois Hancock, Peter Loft, Carole Hooven, Julie Rinaldi, Aaron Wallis, and Karrin Bianchi for their dedication to the integrity of the child and parent treatment programs.

The second author of this paper has disclosed a potential financial conflict of interest because she disseminates these treatments and stands to gain from a favorable report. Because of this, she has voluntarily agreed to distance herself from certain critical research activities (i.e., recruiting, consenting, primary data handling, and analysis) and the University of Washington has approved these arrangements.

Address correspondence to Carolyn Webster-Stratton, University of Washington, School of Nursing, Parenting Clinic, 1107 NE 45th St., Suite 305, Seattle, WA 98105.

Early-onset conduct problems are among the most costly mental disorders to society because such a large proportion of youth with oppositional-defiant disorder (ODD) and conduct disorder (CD) remain involved with mental health agencies or criminal justice systems throughout their lives (Kazdin, 1987). When untreated, early-onset ODD/CD, distinguished by high rates of oppositional, defiant, aggressive, and noncompliant behaviors, is stable over time and appears to be the single most important behavioral risk factor for adolescent delinquency (Kellam, Werthamer-Larsson, Lawrence, & Brown, 1991; Patterson, Reid, & Dishion, 1992). Such behavior has repeatedly been found to predict the development of drug abuse in adolescence as well as other problems such as violence, delinquency, and school dropout (Snyder, 2001). Moreover, since conduct disorder becomes increasingly resistant to change over time, intervention that begins in the early school years is a strategic means of halting the progression of early conduct problems to later delinquency and antisocial behavior.

Given the poor prognosis for children with early-onset conduct problems, there has been a recent increased recognition that early intervention targeted at reducing risk factors such as aggression and noncompliance, as well as increasing their protective factors such as social competence (i.e., problem solving) and academic competence (i.e., interest in learning), could be the single most important step in preventing academic failure, substance abuse, and delinquency in later years. To date, research has indicated that parent intervention programs are an effective way to reduce or eliminate behavior problems before they "ripple" to result in peer rejection, well-established negative reputations, school problems (Bierman, Miller, & Stabb, 1987; Coie, 1990a, 1990b; Laird, Jordan, Dodge, Pettit, & Bates, 2001), and academic failure. A report that emerged from the Division 12 Task Force on Effective Psychosocial Interventions (Task Force on Promotion and Dissemination of Psychosocial Procedures, 1995) reviewed empirically supported mental health treatments for childhood conduct disorders and identified the Incredible Years Parenting Program as one of two "well established" treatments for conduct disorder (Brestan & Eyberg, 1998). This parent intervention program has been shown to produce clinically significant change in children's behaviors, particularly in home interactions with parents immediately posttreatment for approximately 75% of treated children compared to untreated controls, with these results maintaining at the 1-year and 2-year follow-up (Webster-Stratton, 1990; Webster-Stratton & Hammond, 1997; Webster-Stratton, Reid, & Hammond, in press).

More recently, the Incredible Years Parent Training Program was combined with Teacher and Child Training Programs (or a combination of these treatment modalities) in an effort to promote better generalization of children's prosocial behaviors from home to school and with peers. Prior research has suggested that treatment targeted at school risk factors as well as home risk factors will produce more effective short-term gains for reducing children's conduct problems at school as well as at home (e.g., Brestan & Eyberg, 1998; Reid, Eddy, Fetrow, & Stoolmiller, 1999; Webster-Stratton & Hammond,

1997; Webster-Stratton et al., in press). However, to date, the effects of the Incredible Years Teacher and Child Training Programs have not been evaluated for longer follow-up periods. In order to determine whether adding child or teacher components to parent training has the desired preventive effects on later conduct problems, it is important to obtain longer-term follow-up data on treated children. In addition, while these interventions have been shown to move 75% of children from the clinical to the normal range, 25% of treated children continue to show clinical levels of behavior problems at home and/or school. This suggests that, while the treatment was effective for the majority of the sample, a significant proportion of treated children continued to exhibit behaviors that placed them at considerable risk for continued problems into middle school and high school. Understanding what characteristics predict which children will continue to show problematic behaviors has important implications for treatment programs and for preventing the escalation of early conduct problems into later substance abuse and delinquency.

This paper presents 2-year follow-up data for a sample of 159, 4- to 8-year-old children with ODD who were randomly assigned to parent training (PT), parent plus teacher training (PT + TT), child training (CT), child plus teacher training (CT + TT), parent plus child plus teacher training (PT + CT + TT), or a waiting-list control (CON). Immediately following the 6-month intervention, all treatments resulted in significantly fewer conduct problems with mothers, teachers, and peers compared to controls, and these results were maintained at the 1-year follow-up (Webster-Stratton & Hammond, 1997; Webster-Stratton et al., in press). We hypothesized that the positive treatment results found at posttreatment and at the 1-year follow-up would be maintained at the 2-year follow-up, particularly for those intervention conditions that addressed more than one risk factor. It was also expected that posttreatment parenting behaviors would be significant predictors of long-term outcome such that children of parents who continued to show high levels of posttreatment harsh/critical parenting would show less long-term treatment response at home and at school. Because we believe that coercive parenting interactions are central to the ongoing development of conduct problems, we hypothesized that if we did not obtain a substantial reduction in harsh and critical parenting posttreatment, that this would lead to less long-term treatment response for these children.

Methods

Subjects

Child characteristics. Criteria for study entry were: (a) the child was between 4 and 7 years old; (b) the child had no debilitating physical impairment, intellectual deficit or history of psychosis and was not receiving any form of psychological treatment at the time of referral; (c) the primary referral problem was child conduct problems (e.g., noncompliance, aggression, oppositional behaviors) that had been occurring for at least 6 months; (d) parents

reported a clinically significant number of child behavior problems (more than two standard deviations above the mean) on the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980); and (e) the child met *DSM-IV* criteria for ODD and/or CD. For details on screening and intake process, see Webster-Stratton et al. (in press). Study children were 90% boys, with a mean intake age of 70.99 months ($SD = 11.47$), and 79% were Caucasian.

Treatments

Families were randomly assigned to receive CT only, PT only, PT + TT, CT + TT, PT + CT + PT, or were assigned to a wait-list control group that received treatment after an 8- to 9-month waiting period (after the postassessments were conducted for all groups). All treatments are described in detail elsewhere (Webster-Stratton et al., in press).

Attrition and Characteristics of the 2-Year Follow-up Sample

One hundred and fifty-nine families completed the pre- and immediate post-treatment assessments (4 families dropped out after the baseline assessment and did not attend treatment or complete postassessments). There was no significant difference in dropout rate by treatment condition from pre- to postassessment. Of these 159 families, 133 families were in one of the five treatment conditions; the 26 families in the waiting-list control groups received treatment after 1 year and completed no follow-up assessments. Ninety-one percent ($n = 121$) of these 133 treated families completed assessments at the 2-year follow-up. Significantly more families dropped out of the CT condition ($n = 8$) than any other condition (PT, $n = 1$; PT + TT, $n = 0$; CT + TT, $n = 1$; PT + CT + TT, $n = 2$). Children whose families dropped from the CT condition at the 2-year follow-up had significantly lower posttreatment externalizing scores on the CBCL than CT children who did not drop, $t(24) = 3.18, p < .01$. Thus, in the CT condition, families who dropped from the study at the 2-year follow-up had children with fewer behavior problems at postassessment.

Attendance. Intervention dosage was high for all treatment conditions. Over 90% of the children assigned to the CT conditions (CT, CT + TT, or CT + PT + TT) attended at least 15 of the 18 two-hour sessions offered. Over 95% of the parents assigned to the PT conditions (PT, PT + TT, or CT + PT + TT) received at least 15 of the 22 two-hour sessions offered. Analysis indicated no significant differences by treatment condition in the number of sessions children or parents attended. All teachers in TT conditions attended (or made up) all 4 days of training.

Procedures

Families were assessed prior to treatment, 1 to 2 months after treatment, 1-year posttreatment, and 2 years posttreatment (because the waiting-list control group received treatment after the postassessment, no follow-up data are available for this condition). Measures at pre, post, and 1-year follow-up

included parent reports of child behavior and independent observations of parent and child interactions in the home, teacher reports of child behavior and independent observations of children's interactions with teachers and peers in the classroom, and independent observations of children's interactions with peers in the clinic playroom during a structured play session. At the 2-year follow-up, parent and teacher questionnaires were collected, but home and school observational data were not collected.

Measures

Composite Scores for Baseline, Posttreatment, and 1-Year Follow-up

Reliable, valid, and well-established measures were chosen to define each of five major outcome domains (i.e., positive and negative parenting, child social competence, child conduct problems at home and at school) by multiple measures as reported by multiple agents (teachers, parents, independent observers). Scales for each composite score were selected from established measures based on our theory of what behaviors the intervention addressed. The fit of the measures in each composite was examined using principal components analysis. A single factor solution was used and measures with factor loadings of less than .40 were eliminated. Cronbach's alpha was used to evaluate the internal consistency of each composite score. A composite score is likely to provide better measurement despite lower internal consistency than a single measure or agent. In experimental research, lower reliability coefficients can be accepted as satisfactory when the theory justifies combining measures. For example, somewhat dissimilar items are combined to represent multiple facets of a domain (i.e., overt and covert child negative behaviors or observations and report methods), which lowers the reliability coefficient (Rosenthal & Rownow, 1991). The approach we used to develop composite scores followed a similar strategy to that used by Dishion, Patterson, Stoolmiller, and Skinner (1991). Composite scores were computed by converting component measures to percentiles based on the range of each scale and averaging the percentile scale scores. For more information about the construction of these composite scores, please see Webster-Stratton et al. (in press). See Table 1 for a list of scales included in each composite score as well as the references and brief information about each scale. Reliability and validity of all scales are described in other publications (e.g., Webster-Stratton & Hammond, 1997; Webster-Stratton & Lindsay, 1999) or are available by request from the authors.

Results

Summary of Previously Reported Treatment Results Using Composite Scores

Following the 6-month intervention, all treatment conditions resulted in significantly fewer conduct problems for children with mothers, teachers, and peers compared to controls. Children's negative behavior with fathers was lower

TABLE 1
COMPOSITE SCORES WITH COMPONENT VARIABLES

Composite Score and Component Scales	Reference	Alpha for Composite	Type of Measure
Negative parenting composite: mother and father		.59 for mothers .49 for fathers	
Total critical statements (<i>Dyadic Parent-Child Interactive Coding System Revised</i> : DPICS-R)	Robinson & Eyberg, 1981; Webster-Stratton, 1985b		Home observation
Harsh/Critical Parenting scale (<i>Coder Impressions Inventory</i> : CII)	Webster-Stratton et al., in press		Home observation
Family needs intervention (single item) (CII)	Webster-Stratton, Hollinsworth, & Rogers, 1991; Webster-Stratton & Spitzer, 1991		Home observation
Harsh Discipline scale (<i>Parenting Practices Interview</i> : PPI)	Oregon Social Learning Center (OSLC)		Parent report
Ratio of critical to positive discipline (<i>Daily Discipline Inventory</i> : DDI)	Webster-Stratton et al., 1991; Webster-Stratton & Spitzer, 1991		Phone interview: mother
Positive parenting composite: mother and father		.55 for mothers .63 for fathers	
Positive Parenting scale (DPICS-R)	See above		Home observation
Nurturing/Supportive Parenting scale (CII)	See above		Home observation
Supportive Parenting scale (PPI)	See above		Parent report
Child conduct problems at home composite: with mother and father		.78 for mothers .74 for fathers	
Total deviance + noncompliance (DPICS-R)	See above		Home observation
Negative valance (DPICS-R)	See above		Home observation
Overall poor conduct (single item) (CII)	See above		Home observation
Percent time inappropriate (single item) (CII)	See above		Home observation
Intensity score (<i>Eyberg Child Behavior Inventory</i> : ECBI)	Robinson et al., 1980		Parent report

Child conduct problems at school and with peers composite		.77	
Total negative with peers/teachers (MOOSSES)	Tapp, Wehby, & Ellis, 1993		School observation
Poor Authority Acceptance scale (<i>Social Health Profile</i> : SHP)	Werthamer-Larsson, Kellam, & Oveson-McGregor, 1990		School observation
Aggressive Behavior scale (<i>Teacher Assessment of Social Behavior</i> : TASB)	Cassidy & Asher, 1992		Teacher report
Poor Behavioral Conduct scale (<i>Teacher Rating Scales of the Perceived Competence Scale for Young Children</i> : PCSC)	Harter & Pike, 1984		Teacher report
Inappropriate Behavior With Peers scale (<i>Dyadic Peer Interaction Scale</i> : DPIS)	Webster-Stratton et al., 2001		Peer laboratory observation
Child social competence with peers composite		.52	
Positive Communication scale (DPIS)	See above		Peer laboratory observation
Social Contact (SHP)	See above		School observation
Social Acceptance (PCSC)	See above		Teacher report
Prosocial (TASB)	See above		Teacher report
Measures used in analyses but not in composite scores			
<i>Teacher Report Form</i> (TRF)	Achenbach, 1991		Teacher report
<i>Life Experience Survey</i> (LES)	Sarason, Johnson, & Siegel, 1978		Parent report
<i>Dyadic Adjustment Scale</i> (DAS)	Spanier, 1976		Parent report
<i>Beck Depression Inventory</i> (BDI)	Beck, Steer, & Garbin, 1988		Parent report
<i>Hollingshead Social Position Score</i>	Hollingshead & Redlich, 1958		Parent report

TABLE 2
EFFECT SIZE (COHEN'S *d*) FOR SIGNIFICANT FINDINGS ACROSS OUTCOME
DOMAINS FOR EACH TREATMENT GROUP COMPARED TO CONTROL

Composite domains	PT	PT + TT	CT	CT + TT	PT + CT
	vs. Control	vs. Control	vs. Control	vs. Control	vs. Control
Mother negative parenting	.81	.84	.51	.51	.74
Father negative parenting	.51	.91			.77
Mother positive parenting	.51	.51			.46
Father positive parenting	.35				
Child negative at home/mother	.67	.41	.41	.55	.57
Child negative at home/father	.63	.51		.35 ⁺	.63
Child positive with peers			.35	.29 ⁺	.46
Child negative at school	.35	.41	.41	.41	.46
Teacher negative		.63	.35	.46	.55
Summary of significance	7 of 9	7 of 9	5 of 9	4 of 9	8 of 9

⁺ $p < .10$, all others $p \leq .05$.

in the three PT conditions (PT, PT + TT, CT + PT + TT) when compared with children's behavior with fathers in the control condition. Children showed more prosocial skills with peers in the CT conditions (CT, CT + TT, CT + PT + TT) than in control. All PT conditions resulted in less negative and more positive parenting for mothers and less negative parenting for fathers than in control. Mothers and teachers were also less negative than control mothers and teachers when children received CT. Adding TT to PT or CT improved treatment outcome in terms of teacher behavior management in the classroom and according to teacher reports of behavior problems (data reported in Webster-Stratton et al., in press). Effect sizes for these posttreatment results can be found in Table 2. Results for six of the seven composite scores showed maintenance to the 1-year follow-up. The one exception to this was that school behavior of children in the PT + CT + TT deteriorated somewhat from post to the follow-up.

Two-Year Follow-up Descriptive Information

At the 2-year follow-up, parents were asked what additional treatment or services they had obtained for their children following the end of their Incredible Years intervention. Results indicated no significant difference for any of these variables by treatment condition. In addition, rates of medication use for children with pervasive problems did not differ by treatment condition. See Table 3 for the percentage of children who received additional therapy, special education placement, or medication for ADHD.

TABLE 3
2-YEAR FOLLOW-UP DESCRIPTIVE INFORMATION

Additional Services Sought Following Intervention	Percentage
Child therapy	26.7
Family therapy	12.1
Special Education placement	39.6
Child on medication for ADHD	49.5

Note. Ns ranged from 97 to 106.

Clinical Significance at the 2-Year Follow-up

Since our long-term intervention goal is to prevent and treat children's conduct problems, a marker of treatment success is the extent to which children showed clinically significant improvement from baseline to posttreatment. All children in this sample were selected based on their parents' baseline reports of significant behavior problems at home. Clinically significant improvement for home behavior was determined by a 20% reduction in children's ECBI intensity scores according to mother reports. Additionally, half of the children in this sample had pervasive behavior problems at baseline (i.e., clinical levels of behavior problems according to parents' reports *and* teachers' reports of behaviors at school); therefore, it is important to understand the extent to which the interventions produced clinically important changes for this subset of children who initially showed problems at school as well as at home (Schmaling & Jacobson, 1987). These children (baseline TRF scores >63; 54% of the sample) were considered to have made a clinically significant improvement at school if their scores on the TRF moved from above the clinical cutoff score at baseline to below the cutoff immediately posttreatment or at the 2-year follow-up.

Conduct problems at home. See Table 4 for percentage of children who showed a 20% improvement in the ECBI immediately posttreatment and at the 2-year follow-up. On the mother report of ECBI intensity scores *immediately posttreatment*, all treatment conditions except CT and CT + TT showed clinically significant improvement compared to control. In the PT condition, 46.2% of the children improved significantly compared to 20% of control children, $\chi^2(1, N = 51) = 3.92, p < .05$. In the PT + TT condition, 59.1% of the children improved compared to controls, $\chi^2(1, N = 47) = 7.57, p < .01$. In the PT + CT + TT condition, 55% of the children improved compared to controls, $\chi(1, N = 45) = 5.94, p < .02$. There were no significant differences between treatment groups. At the *2-year follow-up*, there was no longer a control group for comparison. However, comparison among groups showed that children in the PT + TT group showed significantly better outcome than children in the PT alone condition, $\chi^2(1, N = 48) = 5.27, p < .02$.

TABLE 4
 CLINICAL SIGNIFICANCE: PERCENT OF CHILDREN SHOWING CLINICALLY SIGNIFICANT CHANGE
 AT POSTTREATMENT AND 2-YEAR FOLLOW-UP

	PT %	PT + TT %	CT %	CT + TT %	PT + CT + TT %	Control %	Significant Contrasts
Mother report child conduct problems at home							
Posttreatment ^a							
Mother report (ECBI Intensity) ^b 20% reduction from baseline	46.2*	59.1**	42.1	47.1	55.0*	20.0	PT, PT + TT, PT + CT + TT > Control
2-year follow-up ^d							
Mother report (ECBI Intensity) ^b 20% reduction from baseline	50.0	81.8	57.9	35.3	60.0	NA	PT + TT > PT*
Teacher report child conduct problems in the classroom							
Posttreatment							
Teacher report, (TRF ExtT) ^c normal range at post 2-year follow-up	25.0	23.1	53.3**	38.5*	36.4*	0.00	CT, CT + TT, PT + CT + TT > Control
Teacher report, (TRF ExtT) ^c normal range at post	57.1	58.3	50.0	53.8	50.0	NA	

^a For posttreatment, PT *n* = 26; PT + TT *n* = 22; CT *n* = 19; CT + TT *n* = 17; PT + CT + TT *n* = 20; Control *n* = 25.

^b ECBI: 20% reduction in the ECBI intensity score was considered clinically significant change.

^c TRF < 63. Only included children above 63 at baseline (54% of the entire sample).

^d For 2-year follow-up, PT *n* = 26; PT + TT *n* = 22; CT *n* = 19; CT + TT *n* = 17; PT + CT + TT *n* = 20; no control group at follow up.

* *p* < .05; ** *p* < .01; *** *p* < .001; + *p* < .10. Significantly different from control group.

Conduct problems at school. According to the teacher report (TRF), immediately posttreatment the CT, CT + TT, and PT + CT + TT conditions showed clinically significant improvements compared to control. Chi-square analyses for each condition compared to control are as follows: CT, $\chi^2(1, N = 23) = 6.54, p < .01$; CT + TT, $\chi^2(1, N = 21) = 4.04, p < .04$; PT + CT + TT, $\chi^2(1, N = 19) = 3.68, p < .05$. There were no between-treatment differences according to teacher reports. At the 2-year follow-up, the numbers of children showing clinically significant improvements on teacher report maintained or improved for all five treatment groups. There were no significant differences between treatment groups; in fact, 50% to 58% of children in all groups showed clinically significant improvement according to teacher reports (since only 50% of the original sample had baseline school problems, this means that approximately 25% of the total original sample were non-responders at school).

Predictors of 2-Year Follow-up Treatment Success and Failure

We were interested in knowing whether the group of children who showed clinically significant treatment response 2 years after treatment were different than the group of nonresponder children who did not fall into the normal range, and, if so, when those differences were apparent. Based on the 2-year follow-up parent and teacher reports, we classified children as treatment responders (if their 2-year follow-up scores were in the normal range) or non-responders (still in the clinical range at the 2-year follow-up). We did this for the entire sample of children and also for the subset of children with pervasive baseline problems (in clinical range on the teacher TRF). We then compared (using *t* tests or chi-square) the 2-year treatment nonresponders and responders on three categories of risk factors: (1) parenting interactions (negative and positive parenting composite scores), (2) child composite scores of behavior at home and school, and (3) family stress (marital satisfaction, parental depression, marital status, social class, and negative life stress). In addition, we compared 2-year outcomes across treatment groups. See Table 5 for a list of the predictor variables examined by domain. The relationship between each predictor variable and the 2-year follow-up child outcomes was examined for three time points: baseline, immediate posttreatment, and 2-year follow-up.

Predictors of 2-year treatment success and failure at home (for the entire sample). At the 2-year follow-up, we classified 75% of these children as "treatment responders at home" because they were in the normal range on the ECBI, and 25% as "treatment nonresponders at home" because they remained in the clinical range.

Treatment condition significantly predicted children's 2-year treatment response on the ECBI, with children in the PT condition and the PT + TT conditions showing significantly greater rates of treatment success than children in the other conditions. Four parenting predictors significantly distinguished the 2-year ECBI treatment responders from the nonresponders (see

TABLE 5
VARIABLES USED TO PREDICT 2-YEAR FOLLOW-UP TREATMENT RESPONSE BY DOMAIN

Parenting interactions
Mother negative parenting composite
Mother positive parenting composite
Father negative parenting composite
Father positive parenting composite
Child behavior at home and at school
Child negative at home with mother composite
Child negative at home with father composite
Child negative school/peer composite
Child negative with peers composite
Family stress
Mother DAS total scale
Father DAS total scale
Marital status
Mother Beck Depression Inventory
Father Beck Depression Inventory
Negative Life Events (mother report)

Note. Relationships between each predictor variable and 2-year child outcome were examined for three time points: baseline, 1-year follow-up, and 2-year follow-up.

TABLE 6
SIGNIFICANT PREDICTORS OF CHILD BEHAVIOR AT HOME
AT THE 2-YEAR FOLLOW-UP (MOTHER REPORT)

Significant Predictors of 2-year Outcome	Mother ECBI Intensity at 2-year Follow-up						<i>t</i> -test
	2-year Responders 69%			2-year Nonresponders 31%			
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	
Baseline mother positive parenting composite	63.74	11.48	79	57.62	14.13	25	<i>t</i> (102) = 2.19*
Baseline father positive parenting composite	58.22	14.59	55	50.13	17.02	22	<i>t</i> (75) = 2.09*
Baseline mother BDI depression scores	7.43	6.04	77	10.40	6.60	25	<i>t</i> (100) = -2.09*
Immediate post tx mother positive parenting composite	69.96	11.56	79	63.30	13.47	25	<i>t</i> (102) = 2.41*
Immediate post tx mother BDI depression	5.20	5.09	79	8.00	5.56	24	<i>t</i> (102) = -2.34*
Immediate post tx father BDI depression	3.83	3.83	54	1.95	2.15	22	<i>t</i> (102) = 2.16*
1-year follow-up mother negative parenting composite	29.40	13.08	77	37.21	15.39	25	<i>t</i> (100) = -2.48*

Note. Cases included in analyses were in clinical range at baseline on mother's ECBI (intensity >128).

* *p* < .05.

Table 6 for means and significance tests for these variables; nonsignificant results are not reported in this table but are available by request from the authors). Parents of treatment responders demonstrated more positive parenting at baseline (significant for both parents) and 1-year follow-up (mothers only) than parents of treatment nonresponders. Mothers of treatment responders were also less negative than mothers of treatment nonresponders at the 1-year follow-up. Surprisingly, no child composite scores at any time point predicted 2-year ECBI treatment response. Of the six family stress predictor variables examined, BDI was the only significant predictor of outcome. Mothers who reported higher levels of depression at baseline and posttreatment were more likely to have a nonresponder child. Fathers' posttreatment BDI scores also distinguished between treatment responders and nonresponders, although these results were not in the predicted direction.

Predictors of 2-year treatment response for children with pervasive home and school problems. Sixty-five children (54%) in our sample had pervasive home and school problems at baseline as measured by scores above the clinical cutoff on the teacher TRF. Of these pervasive children, at 2-year follow-up 26% ($n = 17$) were classified as treatment responders (below the clinical cutoff at the 2-year follow-up) both at home and at school ("home/school" responders). Twenty-nine percent ($n = 19$) were responders at home but not at school ("home-only" responders); 15% ($n = 10$) were responders at school but not at home ("school-only" responders); and 29% ($n = 19$) were still above the clinical cutoffs at both home and school ("pervasive nonresponders"). Our analyses of the children with pervasive behavior problems used the same predictor variables (parent, child, and family variables) at the same three time points to predict the 2-year outcomes.

Children in the PT + TT condition were more likely than the other conditions combined to show 2-year treatment response both at home and at school; PT + TT (50%), PT (20%), CT (25%), CT + TT (10%), and PT + CT + TT (16%); $\chi^2(1, N = 65) = 7.17, p = .007$. Children in the CT + TT condition were more likely to show 2-year treatment response at school (but not at home) than other conditions combined: CT + TT (40%), PT (20%), CT (0%), PT + TT (0%), and PT + CT + TT (16%), $\chi^2(1, N = 65) = 6.78, p = .009$.

For the pervasive subgroup mothers' baseline parenting interactions distinguished between treatment responders and nonresponders (see Table 7 for means and significance tests). At baseline, positive parenting was significantly higher for home/school responders than for home-only responders. Thus, higher levels of mothers' positive parenting were associated with pervasive success (i.e., success at both home and school). Fathers' parenting interactions at any time point did not predict 2-year treatment response. Similarly, none of the child composite scores at any time point predicted children's 2-year treatment response.

In the analyses of family stress variables for children with pervasive problems, marital discord predicted treatment nonresponse at home. The group of children who were 2-year school-only responders (and nonresponders at

TABLE 7
SIGNIFICANT PREDICTORS OF TREATMENT RESPONSE/NONRESPONSE AT HOME AND/OR SCHOOL AT 2-YEAR FOLLOW-UP FOR CASES WITH PERVASIVE CONDUCT PROBLEMS AT BASELINE

	Home & School Responders (H/S) 28%		Home Only Responders (H) 25%		School Only Responders (S) 16%		Nonresponders Home & School (NR) 32%		ANOVA	Newman-Keuls Range Test $p < .05$
	M	SD	M	SD	M	SD	M	SD		
Baseline										
Mother positive parenting composite	67.69	10.42	58.64	13.16	56.17	8.03	63.02	10.47	19	$F(3, 61) = 3.08^*$ H/S > H
Mother DAS total scale	116.08	13.60	114.67	11.18	99.50	15.23	108.42	13.58	12	$F(3, 41) = 3.08^*$ H/S, H > S

Note. Cutoff scores to distinguish response and nonresponse: Home; ECBI Intensity > 123 (Eyberg normative sample $M + 1SD$), School; TRF Externalizing > 59 (borderline-clinical range).
 * $p < .05$.

home) had significantly lower mother DAS (Dyadic Adjustment Scale; Spanier, 1976) at the 1-year follow-up than children who were home/school and home-only responders. No other family stress variables predicted outcome for children with pervasive problems.

Risk Cutoffs for Mothers' Critical Parenting

In our past work, a cutoff score of 10 or more maternal critical statements during the 30-minute home observation has discriminated between abusive and nonabusive parenting (Webster-Stratton, 1985a), and highly critical parenting has been related to poor child outcome (Reid, Baydar, & Webster-Stratton, 2003). Mothers' critical statements were also found to predict treatment success or failure (defined as delinquency and substance abuse) on a 10-year follow-up of children with conduct problems who had received the Incredible Years parent training program (Rinaldi, 2001). Since mothers' negative parenting interactions were also a predictor of 2-year treatment response in the above analyses, we were interested in looking further at mothers' critical parenting using the previously established DPICS cutoff for highly critical parenting (>10 critical statements in 30 minutes).

We chose the teacher report of behavior problems on the TRF as the outcome variable for this analysis because school outcome is a key predictor of children's future adjustment (Dodge, Pettit, & Bates, 1984) and because teacher reports are not only independent of the home observations of critical parenting but less biased indicators of children's adjustment than parent reports. We limited our analyses to children who were above the clinical threshold at baseline on the externalizing score of the TRF (>59), and classified them as responders or nonresponders at the 2-year follow up. We then classified their mothers' posttreatment parenting as "highly critical" (>10) or "noncritical" (<10). We used chi-square analyses to compare children's 2-year follow-up treatment response for highly critical and noncritical mothers. This difference was significant, $\chi^2(1, N = 75) = 4.17, p < .05$, with children of highly critical mothers showing higher rates of treatment nonresponse at school (81%) than children of noncritical mothers (55%). Thus, 81% of the children whose mothers continued to be highly critical posttreatment continued to show school behaviors in the clinical range at the 2-year follow-up.

Discussion

These analyses provide information, according to teachers' and parents' reports on standardized measures, about the maintenance of the treatment effects over time and the comparability of single and multiple risk factor interventions to prevent or halt the continued development of conduct problems for young children. They also provide an analysis of predictor variables associated with treatment success at home and at school.

Two years after treatment, 75% of the entire sample of children scored in

the normal range according to parent report. For children with pervasive problems, defined as problems at school as well as at home, 26% were in the normal range in both settings at the 2-year follow-up, another 44% of the sample scored in the normal range in one setting (29% home normal, 15% school normal). Thus, well over the majority of children in the sample were functioning in the normal range at home and/or at school 2 years after completing treatment for diagnosable levels of behavior problems. Without a control group, it is impossible to say whether these positive outcomes reflect normal maturation or were a direct result of the intervention. However, longitudinal data (Kazdin, 1987; Moffitt, 1990) suggest that, without treatment, children with early-onset conduct problems are at high risk for continuing on the trajectory of escalating conduct disorder and substance abuse. Despite these positive results, however, it is concerning that approximately 25% of the sample was still exhibiting significant levels of problem behaviors at home and/or at school.

Additionally, at the 2-year follow-up, 40% of parents reported that their children had special education placements, and 50% reported that their children had been placed on medication for ADHD. These findings were uniformly found across treatment groups. Thus, 40% to 50% of the entire sample was receiving extra educational support or medication for ADHD.

Given the number of children who showed continued behavior problems, we were interested in examining possible predictors of treatment response at the 2-year follow-up. First we examined whether treatment condition was a significant predictor of treatment outcome. Next, since parenting, prior child behavior problems, and family stress are all risk factors that have been associated with children's conduct problems, we used variables in each of these risk categories to predict treatment response and nonresponse at the 2-year follow-up.

When predicting children's treatment response at home in the entire sample (according to mother report), treatment condition significantly predicted outcome, with PT and PT + TT treatments predicting significantly better outcomes than other treatment conditions. In addition, parenting differentiated between treatment responders and nonresponders. Mothers' and fathers' positive parenting interactions at baseline, mothers' positive parenting at post-treatment, and mothers' negative parenting interactions at the 1-year follow-up significantly distinguished between children whose home behavior was in the normal or abnormal range at the 2-year follow-up. As would be expected, lower levels of positive parenting and higher levels of negative parenting were associated with poorer outcomes. Child behavior (at home and school) and family stress variables did not predict home treatment outcome.

In addition, mothers' reported depression on the BDI distinguished between treatment responders and nonresponders in the total sample. Baseline and immediate posttreatment maternal depression scores were higher (BDI = 10.40) for the 2-year treatment nonresponders than the treatment responders (BDI = 7.43). Fathers' posttreatment BDI scores also distinguished between

treatment responders and nonresponders; however, these results were in the unexpected direction, with fathers of responders showing slightly higher scores than nonresponders. This finding is puzzling, but it is important to note that all father BDI scores were very low (3.83 for the responders and 1.95 for the nonresponders). Thus, neither responders nor nonresponders had fathers who were reporting clinical levels of depression. We used these same predictor variables to examine 2-year treatment response for children with pervasive (home and school) behavior problems. For these children, whether they received a single-risk factor (PT or CT) or two-risk factor treatment condition (adding TT) resulted in a significant difference in terms of treatment outcome at 2-year follow-up. More of the pervasive children in the PT + TT condition (50%) were in the normal range at home and at school than children in any other condition (range: 10% to 25%). In addition, more children in the CT + TT condition (40%) showed improved school outcomes compared to other groups (range: 0% to 22%). Thus, teacher training added to child or parent training in terms of positive school outcomes for children who showed pervasive home and school problems at baseline.

Mothers' parenting was also a significant predictor of 2-year treatment outcome for children with pervasive problems. Two-year positive outcomes across home *and* school settings were associated with higher levels of mothers' baseline positive parenting. Fathers' parenting and child behavior at home and school did not distinguish between responders and nonresponders (this may be due to smaller sample size and lower power). Mothers' posttreatment marital satisfaction scores also significantly predicted treatment response. Children who were school-only responders (and home nonresponders) had parents who were less satisfied in their marriages by approximately one standard deviation on the DAS.

It is somewhat surprising and interesting that parenting behavior predicted 2-year outcome and that child behavior did not. A recent study by Loeber and colleagues (Burke, Loeber, Mutchka, & Lahey, 2002) found that children's prior conduct disorder diagnosis, their delinquent acts, and their poor communication skills were the strongest predictors of persistent delinquency in adolescence. The difference in these findings could be due to the child's age. The children in the Loeber sample were older (7 to 12 years) at the first assessment point than the children in our sample. Perhaps parenting has a stronger effect on children's behavior in the younger age range. Another notable difference between these two studies is that the Loeber study did not use independent observations of children's behavior. Perhaps the independent observations provided more sensitive measures of parenting and child behaviors than parent reports provide.

Given the indication that parenting behavior was an important predictor of 2-year treatment response, we were interested in determining whether a risk cutoff for critical parenting could be used to predict which families would be likely to need ongoing treatment following our initial intervention. In our prior research, the cutoff of 10 maternal critical statements during a 1-hour

observation period has been an indicator of high-risk parenting. We used this cutoff to determine whether the children of mothers who continued to be highly critical following treatment would be at higher risk for treatment failure than children of noncritical mothers. We found that if mothers were highly critical (>10 critical statements) at the posttreatment assessment, their children showed an 80% likelihood of having clinically significant problems at school at the 2-year follow-up. Thus, highly critical parenting from mothers is a strong predictor of continued poor outcome for children. This finding is consistent with work by Schrepferman and Snyder, who found that when posttreatment coercive interactions between parents and their children with conduct problems did not reach a normative level, children were at increased risk for later arrest and out-of-home placements (Schrepferman & Snyder, 2002). Thus, it seems that it is not enough for treatment to reduce negative parenting behaviors (in both studies coercive parent-child interactions significantly decreased overall). Rather, negative parenting may need to be brought below a critical threshold in order to reduce the risk of continued conduct problems. For families that did not reach this threshold, we would want to continue to work with a parent and child until we had lowered the level of negativity to below this cutoff. It should be noted, however, that in our sample, approximately half of the children of noncritical mothers were also struggling at school. So, while critical parenting places children at higher risk for negative outcomes, other factors, such as distressed marriages or child temperament, are also contributing to poor outcomes for children.

Perhaps a medical analogy is appropriate. Physicians know that high blood pressure is a risk factor for heart disease, and a patient whose blood pressure falls above a clinical cutoff would almost certainly be put on medication because of the higher probability of heart disease, stroke, and death without intervention. This does not preclude other causes of heart disease, and, indeed, many patients may still be at risk for heart disease in the absence of a high blood pressure risk indicator due to factors such as diabetes, high cholesterol, lack of exercise, or being overweight. However, blood pressure is one measurable and reliable risk factor with a known treatment option, and those with other risk factors will need additional intervention. In this same way, a high level of critical parenting is one reliable risk factor for later conduct disorders, and parenting training does produce reductions in critical parenting. However, parents who, posttreatment, are still at risk on this indicator should receive further preventive intervention to lessen the risk of their child's continuing conduct problems, in the same way that a person with hypertension needs additional treatment if the first drug does not control the problem.

We are encouraged by the finding that teacher training added significantly to child and parent training in terms of longer-term reduction and prevention of conduct problems in children's school outcomes. Analyses of the short-term results comparing treatment combinations showed few differential treatment effects by conditions (although all conditions were superior to control). Since we had hypothesized that teacher training would add significantly to

parent or child training, we were somewhat puzzled by those results. It may have been that since only 50% of our sample showed pervasive problems at home and at school, effects of the treatment on school behavior were diluted when we conducted the analyses on the entire sample of children (50% of whom did not show baseline problems at school). These more selective analyses using only children with pervasive problems speak to the added benefits of intervention with teachers when a child's behavior problems extend to the school setting.

Regarding treatment recommendations, it seems that treatments that include the PT component are important in terms of improving children's behavior at home, while TT enhanced the effects of CT or PT for children with pervasive problems. Therefore, PT + TT would be the first treatment of choice for children with pervasive problems as that combination produced the most changes in children's behavior across settings. However, if parent training is not a viable option, the combination of CT + TT is likely to produce significant change in children's behavior at school and with peers. In addition, the prediction analyses indicated that posttreatment levels of parenting behaviors are an important indicator of whether children are at continued risk. Parents who show clinically high (>10 criticisms) levels of critical parenting immediately following treatment have children who are at greater long-term risk. It seems that clinicians who are treating young children for conduct problems should match the treatments (parent, child, and/or teacher interventions) they offer to the domain in which the problems are occurring as well as monitor posttreatment levels of negative parenting and stress in order to prevent children from continuing on the trajectory from early-onset conduct problems to later, more serious school problems and delinquency.

References

- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77-100.
- Bierman, K. L., Miller, C. M., & Stabb, S. (1987). Improving the social behavior and peer acceptance of rejected boys: Effects of social skills training with instructions and prohibitions. *Journal of Consulting and Clinical Psychology, 55*, 194-200.
- Brestan, E. V., & Eyberg, S. M. (1998). Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology, 27*, 180-189.
- Burke, J. D., Loeber, R., Mutchka, J. S., & Lahey, B. B. (2002). A question for DSM-V: Which better predicts persistent conduct disorder—delinquent acts or conduct symptoms. *Criminal Behaviour and Mental Health, 12*, 37-52.
- Cassidy, J., & Asher, S. R. (1992). Loneliness and peer relations in young children. *Child Development, 63*, 350-365.
- Coie, J. D. (1990a). Adapting interventions to the problems of aggressive and disruptive rejected children. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 309-337). Cambridge: Cambridge University Press.

- Coie, J. D. (1990b). Toward a theory of peer rejection. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 365–398). Cambridge: Cambridge University Press.
- Dishion, T. J., Patterson, G. R., Stoolmiller, M., & Skinner, M. L. (1991). Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology, 27*, 172–180.
- Dodge, K. A., Pettit, G. S., & Bates, J. E. (1984). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development, 65*, 649–665.
- Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development, 55*, 1969–1982.
- Hollingshead, A. B., & Redlich, F. C. (1958). *Social class and mental illness*. New York: Wiley Press.
- Kazdin, A. E. (1987). *Conduct disorders in childhood and adolescence*. Newbury Park, CA: Sage.
- Kellam, S. G., Werthamer-Larsson, L., Lawrence, J., & Brown, C. H. (1991). Developmental epidemiologically based preventive trials: Baseline modeling of early target behaviors and depressive symptoms. *American Journal of Community Psychology, 19*, 563–584.
- Laird, R. D., Jordan, K. Y., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2001). Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Development and Psychopathology, 13*, 337–354.
- Moffitt, T. E. (1990). Juvenile delinquency and attention deficit disorder. Boys' developmental trajectories from age 3 to 15. *Child Development, 61*, 893–910.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *A social interactional approach: Anti-social boys (Vol. 4)*. Eugene, OR: Castalia.
- Reid, J. B., Eddy, J. M., Fetrow, R. A., & Stoolmiller, M. (1999). Description and immediate impacts of a preventive intervention for conduct problems. *American Journal of Community Psychology, 27*, 483–517.
- Reid, M. J., Baydar, N., & Webster-Stratton, C. (2003). *Halting the development of externalizing behaviors in Head Start children: The effects of preventive parent training*. Manuscript submitted for publication.
- Rinaldi, J. A. (2001). *Long-term outcomes of parent training and predictors of adolescent adjustment*. Unpublished manuscript.
- Robinson, E. A., & Eyberg, S. M. (1981). The dyadic parent-child interaction coding system: Standardization and validation. *Journal of Consulting and Clinical Psychology, 49*, 245–250.
- Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*, 22–28.
- Rosenthal, R., & Rownow, R. L. (1991). *Essentials of behavioral research, methods and data analysis*. San Francisco: McGraw-Hill.
- Sarason, I. G., Johnson, J. H., & Siegel, M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology, 46*, 932–946.
- Schmaling, K. B., & Jacobson, N. S. (1987, November). *The clinical significance of treatment gains resulting from parent training interventions for children with conduct problems: An analysis of outcome data*. Paper presented at the annual meeting of the Association for Advancement of Behavior Therapy, Boston.
- Schrepferman, L., & Snyder, J. (2002). Coercion: The link between treatment mechanisms in behavioral parent training and risk reduction in child antisocial behavior. *Behavior Therapy, 33*, 339–359.
- Snyder, H. (2001). Epidemiology of official offending. In R. Loeber & D. Farrington (Eds.), *Child delinquents: Development, intervention, and service needs* (pp. 25–46). Thousand Oaks, CA: Sage.

- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38, 15–28.
- Tapp, J. T., Wehby, J. H., & Ellis, D. N. (1993). MOOSES: A multiple option observation system for experimental studies. *Behavioral Research Methods, Instruments, & Computers*, 25, 53–56.
- Task Force on Promotion and Dissemination of Psychosocial Procedures. (1995). Training in and dissemination of empirically-validated psychological treatments: Report and recommendations. *The Clinical Psychologist*, 48, 3–23.
- Webster-Stratton, C. (1985a). Comparison of abusive and nonabusive families with conduct-disordered children. *American Journal of Orthopsychiatry*, 55, 59–69.
- Webster-Stratton, C. (1985b). *Dyadic parent-child interactive coding system-revised (DPICS-R): Manual*. Unpublished manual, University of Washington.
- Webster-Stratton, C. (1990). Long-term follow-up of families with young conduct-problem children: From preschool to grade school. *Journal of Consulting and Clinical Psychology*, 19, 1344–1349.
- Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology*, 65, 93–109.
- Webster-Stratton, C., Hollinsworth, T., & Rogers, K. (1991). *Peer Problem-Solving Interaction Communication Affect Rating Coding System (PPS-I-CARE)*. Unpublished manuscript, University of Washington.
- Webster-Stratton, C., & Lindsay, D. W. (1999). Social competence and conduct problems in young children: Issues in assessment. *Journal of Clinical Child Psychology*, 28, 25–43.
- Webster-Stratton, C., Reid, M. J., & Hammond, M. (in press). Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *Journal of Clinical Child and Adolescent Psychology*.
- Webster-Stratton, C., & Spitzer, A. (1991). Development, reliability, and validity of the Daily Telephone Discipline Interview. *Behavioral Assessment*, 13, 221–239.
- Werthamer-Larsson, L., Kellam, S. G., & Oveson-McGregor, K. E. (Eds.). (1990). *Teacher interview: Teacher observation of classroom adaptation-revised (TOCA-R)*. Baltimore: Johns Hopkins University.

RECEIVED: December 2, 2002

ACCEPTED: April 7, 2003