

Treating Children With Early-Onset Conduct Problems: A Comparison of Child and Parent Training Interventions

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Families of 97 children with early-onset conduct problems, 4 to 8 years old, were randomly assigned to 1 of 4 conditions: a parent training treatment group (PT), a child training group (CT), a combined child and parent training group (CT + PT), or a waiting-list control group (CON). Posttreatment assessments indicated that all 3 treatment conditions had resulted in significant improvements in comparison with controls. Comparisons of the 3 treatment conditions indicated that CT and CT + PT children showed significant improvements in problem solving as well as conflict management skills, as measured by observations of their interactions with a best friend; differences among treatment conditions on these measures consistently favored the CT condition over the PT condition. As for parent and child behavior at home, PT and CT + PT parents and children had significantly more positive interactions, compared with CT parents and children. One-year follow-up assessments indicated that all the significant changes noted immediately posttreatment had been maintained over time. Moreover, child conduct problems at home had significantly lessened over time. Analyses of the clinical significance of the results suggested that the combined CT + PT condition produced the most significant improvements in child behavior at 1-year follow-up.

As has become all too evident to researchers in the field as well as to the general public, the incidence of conduct problems in young children is increasing. Current estimates are that 7% to 25% of children are affected. This trend is disturbing, both in itself and in its social implications, for research has shown that the emergence of early-onset conduct problems in young children (in the form of high rates of oppositional defiant, aggressive, and noncompliant behaviors) is related to a variety of health and behavioral problems in adolescence—peer rejection, drug abuse, depression, juvenile delinquency, and school dropout (Campbell, 1991; Loeber, 1991).

In response to this growing social problem, a variety of innovative parent training interventions have been designed with the aim of reducing children's conduct problems (e.g., for review of parent training, see Eyberg, 1992, and Webster-Stratton, 1993). The rationale for targeting parenting behavior as the primary focus of intervention arises from the considerable body of research indicating that parents of children diagnosed with

oppositional defiant disorder (ODD) or conduct disorder (CD) lack certain fundamental parenting skills (e.g., Patterson, 1982). Indeed, reviews of these parent training interventions are highly promising (e.g., Webster-Stratton, 1993), particularly for young children (ages 4 to 8 years) with early-onset conduct problems. The short- and long-term success of treatment has been documented by significant improvements in children's behaviors (as well as parents') and improved child adjustment for at least two thirds of treated children (Patterson, 1982; Webster-Stratton, 1985).

Despite these successes, there is evidence that some families do not continue to show clinically significant responses to parent training interventions, regardless of whether treatment response is defined as the extent to which children's adjustment falls in the normal (nonclinical) range of functioning as reported on standardized measures completed by parents or teachers (Jacobsen, Follette, & Revenstorf, 1984) or simply as an improvement of 30% or greater in observed behaviors from baseline (Webster-Stratton, Hollinsworth, & Kolpacoff, 1989). In long-term follow-up studies, 30% to 40% of parents who had received parent training reported continued child behavior problems in the clinical range. Teachers reported a similar percentage (25% to 50%) (Forehand & Long, 1986; Webster-Stratton, 1990).

What factors might account for the nonresponse of some families? It could be argued that the effectiveness of parent training as an intervention is limited precisely by its exclusive focus on parenting behavior. Research has shown that other risk factors play a role, risk factors that we term *child risk factors*; namely, children with ODD-CD have deficits in their social skills, problem-solving skills, and self-control, which contribute to poor peer interactions, negative or hostile attributions about events, and conduct problems (e.g., Richard & Dodge, 1982; Rubin & Krasnor, 1986).

In light of these findings, interventions have been designed to

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This research was supported by the National Center for Nursing Research Grant 5 R01 NR01075-11 from the National Institutes of Health and Research Scientist Development Award MH00988-04 from the National Institute of Mental Health.

We are grateful to the following people, who assisted in extensive work related to data collection and data management: Kate Calhoun, Doris Harkness, Karrin Grutz, Nat Houtz, Susan Reanier, Kathy Rogers, and Aaron Wallis. Special appreciation goes to Diane Elliott, Lois Hancock, Terri Hollinsworth, Marcia King, and Joyce Victor for their dedication to the integrity of the child and parent treatment programs.

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address the relevant child risk factors (for review, see Bierman, 1989). Evaluations of these innovative child training programs are somewhat encouraging, but with certain caveats. First, there is a lack of evidence that these programs are effective in reducing conduct problems per se (Denham & Almeida, 1987); their effectiveness has been demonstrated primarily in terms of improved social skills—and only for older children, and only at school (e.g., Kazdin, Esveldt-Dawson, French, & Unis, 1987a, 1987b; Kendall, 1985; Lochman, Burch, Curry, & Lampron, 1984; Spivack, Platt, & Shure, 1976). Younger or less mature children, as well as more aggressive children, have been relatively unaffected by social skills and problem-solving training (Coie, 1990). Existing child training interventions have not produced generalization of improvements in social and cognitive skills from the laboratory, inpatient settings or school to other settings, nor were short-term treatment effects maintained over time (for review, see Beelmann, Pfungsten, & Losel, 1994; Prinz, Blechman, & Dumas, 1994). The absence of generalization and maintenance of acquired skills appears to hold regardless of the child's age.

Why has child training not proven effective with younger conduct-problem children? Three possible explanations are apparent. First, existing child training interventions may have been inappropriate in content or mode of presentation. Interventions designed originally for older school-age children and adolescents are not developmentally appropriate for preschool and early school-age children, who are preoperational in their thinking. Some programs appear to be too cognitively sophisticated. Moreover, with some exceptions, most of these programs have not focused specifically on conduct problems and noncompliance, nor have they addressed specific classroom behaviors such as impulsive talking, bothering other children, failure to raise a quiet hand, and so forth. Direct behavioral prohibitions or specific consequences such as "time out" for negative behaviors are rarely included (Bierman, Miller, & Stabb, 1987). In light of these defects, it is hardly surprising that existing child training interventions have been ineffective, particularly with younger, aggressive, peer-rejected children. Clearly, training interventions for children with conduct problems should be age appropriate and tailored to the particular problem behaviors.

Secondly, the failure of child training interventions to produce cross-setting generalization and long-lasting improvements in behavior may arise from the narrowness of their focus. In focusing on social skills, cognitive problem solving, social perspective taking, or self-control training, an intervention may neglect other relevant risk factors (for review, see Beelman et al., 1994). As for setting, because child training does not usually involve parents, these interventions do not necessarily help children learn to use learned skills at home. Programs that are multimodal (i.e., with affective, behavioral, cognitive, and social components) and cross-contextual (i.e., involving home, school, and clinic) hold promise for better generalization and maintenance of behavioral changes (e.g., Prinz et al., 1994; Weissberg & Allen, 1986).

Thirdly, child training interventions may have failed to produce convincing results because of flawed research design (e.g., heterogeneous groups, small sample sizes, and lack of long-term follow-up). Few studies of child training have involved clinical samples of young children referred specifically for conduct

problems; rather, conduct-problem children are often grouped with socially isolated and withdrawn children or children with other developmental problems, who may respond differently to the intervention. Moreover, there is comparatively little research on interventions with conduct-problem children below the age of 8, with the preponderance of studies focusing on older aggressive children and adolescents (e.g., Kendall, 1981; Weissberg, Caplan, & Bennetto, 1988). Furthermore, because few studies have measured training outcomes by means of direct observation of child behavior in the home or with peers, it is unknown whether children who show improvements in cognitive processes, social skills, and sociometric ratings will also show a reduction in conduct problems. Child training interventions should be evaluated by means of sensitive measures of problem behaviors as well as measures of social skills or other training goals.

The purpose of this randomized trial was to compare three models of intervention: child training (CT), parent training (PT), and a combined approach (CT + PT). Because the first two interventions target different antecedent risk factors, this study enables us to speculate about the relative impact of these risk factors (i.e., children's deficits in social skills, problem solving, and affect regulation vs. parents' use of coercive discipline and negative parenting styles). Our hypothesis was that, by combining the parent and child interventions, we would improve the generalization and clinical effectiveness of our existing parent training program by addressing a wider range of risk factors. This hypothesis is partially supported by the research of Kazdin et al. (1987a, 1987b), who reported that a combination of parent and child training was somewhat superior to either intervention alone, as measured by parent reports of aggressive behavior. This study, however, did not include parent-child interactions as an outcome variable. This variable is crucial in light of recent research by Patterson and Forgatch (1995), which suggests that changes in parents' interactions with their children, as independently observed after treatment, is the best predictor of future child adjustment—not parent or teacher reports.

Families were assigned at random to one of four conditions: (a) CT, (b) PT, (c) CT + PT, and (d) waiting-list control. Detailed assessments of the interventions included parent reports of child behavior and of their own discipline, independent observations of children's interactions with peers in the clinic playroom and with parents at home, independent observations of parents' behaviors at home, assessments of children's social and problem-solving skills, and consumer satisfaction.

Method

Participants

Child characteristics. Criteria for study entry were as follows: (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 misconduct (e.g., noncompliance, aggression, oppositional behaviors) that had been occurring for at least 6 months; (d) parents had to have reported a clinically significant number of child behavior problems (more than 2 *SD* above the mean) on the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980); and (e) the child met criteria for ODD and CD in accor-

dance with the revised third edition of the *Diagnostic and Statistical Manual of Mental Disorders DSM-III-R*; American Psychiatric Association, 1987). Entry into the study first consisted of a telephone screening interview using the ECBI to be sure children met the initial criteria for a clinically significant number of conduct problems. Next they were eligible for a 2–3 hr intake interview, which consisted of a structured diagnostic interview; diagnosis was made according to criteria for ODD and CD in accordance with the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM-III-R*; American Psychiatric Association, 1980). Children meeting the *DSM-III-R* criteria for ODD and attention deficit–hyperactivity disorder (ADHD) were included in the sample because of the high comorbidity of these problems. Three highly trained therapists conducted the intake interviews, and all of these interviews were videotaped for review. Random and regular review of videotaped interviews indicated high reliability of diagnosis among the therapists.

Study children included 72 boys and 25 girls, with a mean age of 68.90 months ($SD = 14.32$). The percentage of Caucasian children was 85.6. The mean number of pretreatment behavior problems according to the mother ECBI Problem Score was 21.82 ($SD = 6.25$), indicating that the children were in the clinical range according to Robinson et al. (1980) (for normative sample nonclinic range, $M = 6.8$, $SD = 3.9$). Home observations before treatment confirmed the ECBI results, with the children exhibiting deviant behaviors with mothers at home at a mean rate of 17.29 (i.e., more than one negative behavior every 2 min).

Attendance. Of the 27 children assigned to CT, all but 1 child attended 15 or more of the 22 sessions. Because this “low attender” attended 13 sessions (more than half), we included him in the analysis. The mean number of sessions attended by CT children was 19.67 ($SD = 2.84$). All the 22 children in the CT + PT condition attended 15 or more sessions. Analysis indicated that CT + PT children attended a mean of 19.00 sessions ($SD = 1.51$), and there were no dropouts. In the PT condition, 23 mothers and 14 fathers attended 15 or more sessions, and the remaining 3 mothers and 3 fathers attended 12–14 sessions. In the CT + PT condition, 18 mothers and 15 fathers attended 15 or more

sessions, and the remaining 2 mothers and 1 father attended 12–14 sessions. The mean number of sessions attended by parents in PT was not significantly different from the number attended by parents in CT + PT (18.23 and 17.88 sessions for mothers and fathers in PT; 19.60 and 18.50 sessions for mothers and fathers in CT + PT).

Parent characteristics. Study parents included 95 mothers and 71 fathers. Of these, 68.0% were married or otherwise partnered; 32.0% were single. See Table 1 for demographic variables by treatment condition.

Treatment Conditions

Once accepted for entry, families were continuously assigned at random to one of four conditions.

CT condition. We assumed that younger children would be more likely to benefit from a performance-based intervention approach, rather than a cognitive or predominantly verbal approach (Singer & Singer, 1983). Videotape modeling is one such performance-based approach. Although there has been no previous research on videotape modeling as a child training intervention, much research attests to the potent modeling effects of television on children’s behaviors (Singer & Singer, 1983)—particularly its promotion of aggressive behaviors. Accordingly, we designed a videotape program of more than 100 vignettes depicting children in a variety of situations and settings (e.g., at home with parents, in the classroom, and on the playground). In addition to using videotape modeling methods, the program involves fantasy play with life-size puppets (including a number of dinosaurs) who present their ongoing interpersonal problems. This element was included because imaginary play is highly important to 4- to 7-year-olds (e.g., Gottman, 1986); we hypothesized, therefore, that a program for young children would be more effective if it appealed to their imaginations. We referred to this child training program as our “Dinosaur School.”

The content of the programs (and the accompanying discussions) specifically addressed interpersonal difficulties typically encountered by

Table 1
Demographic Variables for Four Groups

Demographic measures	CON		CT		PT		CT + PT	
	M or %	SD	M or %	SD	M or %	SD	M or %	SD
C age (months)	67.68	16.39	71.44	12.77	64.00	15.24	72.77	11.63
C gender (% male)	68.2		74.1		80.8		72.7	
C ethnicity (% Caucasian)	86.4		88.9		84.6		81.8	
C age of onset ^a	3.09	2.07	3.74	1.93	2.85	1.69	3.36	1.89
Social position score ^b	30.27	12.28	32.74	15.71	36.08	16.55	33.00	15.34
% with family income (recoded)								
Less than \$9,000	0.0		11.1		15.4		0.0	
\$9,000–\$20,999	18.2		11.1		15.4		9.1	
\$21,000–\$39,999	27.3		29.6		30.8		36.4	
\$40,000–\$69,999	31.8		25.9		23.1		40.9	
\$70,000 or more	22.7		22.2		15.4		13.6	
Marital status (% partnered)	77.3		70.4		61.5		63.6	
M age	34.45	8.43	33.74	5.98	35.96	8.27	36.15	6.60
M education ^c	2.68	1.13	3.07	1.36	3.08	1.41	2.75	0.91
M ethnicity (% Caucasian)	100.0		92.6		92.3		90.0	
F age	38.65	5.86	36.55	7.17	40.12	10.97	38.38	5.41
F education ^c	2.44	0.92	2.60	1.50	2.47	1.23	2.81	1.11
F ethnicity (% Caucasian)	88.9		100.0		82.3		100.0	

Note. CON = waiting-list control ($n = 22$); CT = child training ($n = 27$); PT = parent training ($n = 26$); CT + PT = combined child and parent training ($n = 22$); C = child; M = mother; F = father.

^a Scale for age of onset: 1 = 0–6 months; 2 = 7–12 months; 3 = 13–24 months; 4 = 25–36 months; 5 = 37–48 months; 6 = 49–60 months; 7 = 61–72 months; 8 = 73–84 months; 9 = more than 84 months. ^b For social position score, higher scores denote lower social position. ^c For the Education scale, 1 = graduate school; 2 = 4 years of college; 3 = partial college; 4 = high school graduate; 5 = partial high school.

Table 2
Parent and Teacher Reports of Target Child Behaviors Before and After Treatment by Group

Measures	CON				CT			
	Pre		Post		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Parent								
CBCL total behavior problems*								
Mother	67.68	7.71	66.41	7.21	67.07	7.95	62.15	9.43
Father	62.00	8.59	62.39	8.75	64.30	8.29	55.30	10.94
ECBI intensity score								
Mother	163.67	30.47	155.57	27.86	155.52	29.06	121.70	22.96
Father	144.10	24.93	146.89	28.40	153.60	21.08	124.60	24.55
PSI child domain								
Mother	138.18	22.03	138.45	20.70	140.41	22.18	127.48	22.35
Father	123.89	17.87	129.06	17.77	134.05	18.72	120.85	19.65
Teacher								
PBQ total problems	18.20	11.87	13.30	9.65	20.96	11.32	15.15	11.17

Note. CON = waiting-list control ($n = 22$ mothers + 18 fathers, and 20 teachers); CT = child training ($n = 27$ mothers, 20 fathers, and 26 teachers); PT = parent training ($n = 26$ mothers, 17 fathers, and 23 teachers); CT + PT = combined child and parent training ($n = 20$ mothers, 16 fathers, and 20 teachers); ANCOVA = analysis of covariance; Pre = pretreatment; Post = posttreatment; CBCL = Child Behavior Checklist; ECBI = Eyberg Child Behavior Inventory; PSI = Parenting Stress Index; PBQ = Preschool Behavior Questionnaire.

* CBCL t scores.

* $p < .05$. ** $p < .01$. *** $p < .001$. † $p < .10$, statistically marginal effect.

young children (ages 4 to 8) who have conduct problems: lack of social skills and conflict resolution skills, loneliness and negative attributions, inability to empathize or to understand another perspective, and problems at school. Videotape scenes depicted children coping with stressful situations in a variety of ways: controlling their anger with the "turtle technique"; problem solving at home and school; making friends; coping with rejection and teasing; paying attention to teachers; finding alternatives to bothering a child sitting next to them in the classroom; and cooperating with family members, teachers, and classmates.

At Dinosaur School, children were sent to Time Out for physical aggression and noncompliance. In early sessions, they were shown videotapes of children in Dinosaur School receiving rewards for cooperating and going to Time Out for misbehavior. When shown the videotapes depicting children going to Time Out, the children were taught how to handle themselves in Time Out and what self-talk to use while they were there (e.g., "I can cope with this and calm down," "I can go back and be successful," "I'm okay, I just made a mistake"). To develop skills of empathy and to counter their tendency toward negative attribution, children were asked throughout the program to identify the feelings of the children on the videotapes and to discuss possible reasons for the children's feelings.

Our use of interactive videotape modeling for this CT intervention is based on a coping model wherein children are encouraged to discuss the use of positive social skills in different situations, to apply them to hypothetical situations, and to practice those skills. Children collaborated with each other in small groups to develop a varied repertoire of acceptable solutions and coping skills for situations they frequently encounter. The experience of collaboratively finding new solutions to typical conflicts and discussing feelings that have arisen for them in situations commonly encountered by "problem" children (e.g., being kicked out of school or put "on the wall") also contributes to strong bonds—for these children, sometimes their first friendships.

The methodology of the intervention was also made developmentally appropriate. Because young children are more vulnerable to distraction and possess fewer organizing skills, our CT condition incorporated specific strategies to strengthen motivation, hold their attention, and reinforce key concepts and newly acquired skills. Homework exercises were

sent home with children each week to remind them to practice key concepts, along with cue cards, coloring books, cartoons, and stickers to serve as additional prompts. To enhance generalization, weekly sessions included (a) group activities (e.g., art projects, games) involving the new concepts, (b) role plays to provide opportunities to reenact conflictual situations using new skills, and (c) stories depicting children solving social problems and stating their feelings. In addition, weekly letters were sent to teachers and parents explaining the key concepts being taught that week and the rationale for the targeted skill (e.g., sharing, teamwork, friendly talk, listening, compliance to requests, feeling talk, problem solving, etc.); teachers and parents were asked to reinforce the targeted social skills whenever they noticed the child using them in the home or school. Teachers and parents were provided with weekly good behavior charts, and the children received bonus rewards for bringing these charts to the training session each week.

The children (20 boys, 7 girls) assigned to the CT condition were divided into groups of five or six who came to the clinic weekly for 22 sessions with two therapists (lasting approximately 6 months). During each 2-hr session, children watched approximately 30 min of noncontinuous videotape programs (i.e., 10–12 vignettes of modeled skills per session). After each viewing of a 1- to 2-min vignette (a child with parents or peers), the therapists led a discussion of the interactions, eliciting the children's reactions, ideas, and questions about the material. Leader manuals and a more complete description of the videotape training programs are available (Webster-Stratton, 1991).

PT condition. The parents (26 mothers, 17 fathers) assigned to the PT condition were divided into groups of 10–12 parents who met weekly with a therapist at the clinic for a 2-hr session. Over the course of 22–24 weeks, they watched the 17 videotape programs on parenting and interpersonal skills. The efficacy of this intervention has been amply documented and described in detail elsewhere (e.g., Webster-Stratton, 1990). Here we were interested in comparing the relative efficacy of this proven intervention with our new CT program (partially to evaluate the importance of child vs. parent risk factors) and in determining what additive effects CT might contribute to PT.

CT + PT condition. The families (20 mothers, 16 fathers, and 22 children) assigned to this condition came to the clinic weekly for 22–

PT				CT + PT				4-group ANCOVA F	Contrasts (<i>t</i>)		
Pre		Post		Pre		Post			CT vs. CON	PT vs. CON	CT + PT vs. CON
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
65.50	7.81	56.00	8.93	65.30	6.11	57.05	7.66	7.11***	-1.82†	-4.22***	-3.46**
62.65	7.88	54.47	9.24	66.19	7.75	57.44	10.26	4.83**	-3.33**	-3.08**	-2.83**
166.46	23.72	118.73	27.71	161.55	33.43	121.40	24.25	11.14***	-4.42***	-5.30***	-4.42***
155.10	19.19	112.00	26.72	150.20	26.73	123.10	24.20	9.08***	-3.54**	-5.06***	-3.34**
143.54	19.06	115.42	20.27	141.75	18.65	126.30	17.38	7.69***	-2.78*	-4.78***	-2.43**
127.71	15.23	111.59	17.41	130.44	19.52	115.06	18.03	6.00**	-2.81**	-2.83***	-3.40**
15.39	10.78	14.78	8.11	25.25	13.46	16.60	11.17	0.84	0.15	1.25	-0.21

24 sessions for PT and CT. Their PT and CT training programs were identical to that described above for the other two conditions but took place separately from the other training.

Control group (CON). The families (22 mothers, 18 fathers, and 22 children) assigned to the control condition received no treatment and had no contact with a therapist. After waiting 8–9 months, control-group children were reassessed and families were then randomly assigned to one of the three interventions.

Therapists

Six clinicians and a supervisor (35–50 years old) served as therapists for the parent groups and child groups. Each had a master's or doctoral-level degree in a mental-health-related field (e.g., nursing, social work, psychology, education) and had had considerable experience (5–20 years) with behavior-problem children and family counseling. They received extensive training in the content and techniques of the interventions. Each session was detailed in a manual that specified the content of each session, the videotape vignettes to be shown, questions to be explored, recommended role plays, weekly activities and stories, and homework assignments. Therapist supervision consisted of observation of groups, review of videotapes of group sessions, and weekly meetings to discuss issues relative to individual participants and groups.

Treatment Integrity

To ensure the integrity of treatment, therapists co-conducted their first 22-session group with the supervisor, followed a treatment manual for each session, and kept detailed notes of each session, documenting group process. All therapists completed weekly protocol checklists of standards to be covered in each session (i.e., agenda, number of vignettes, role plays to be completed, themes to be discussed, etc.). All child and parent group sessions were videotaped for feedback and analysis at a regular weekly meeting and therapists received ongoing supervision, feedback, and training throughout the study. Therapists frequently looked at each other's tapes and compared them with the standard set of training tapes

of the supervisor's groups. Finally, the supervisor randomly picked videotapes of group sessions for integrity checks. Treatment integrity was very high because of the close monitoring, standardized materials (i.e., videotapes), and comprehensive training manuals.

Assessment

Families were assessed before treatment, 2 months after treatment, and approximately 1 year later. Measures included parent reports of child behavior, mother reports and independent observations of parent-child interactions in the home, and independent observations of children's interactions with peers in the clinic playground. When possible, fathers, as well as mothers, completed the parent report measures, but instructions were given to complete the questionnaires separately. Because of practical limitations, only the mothers received the weekly telephone calls concerning children's behavior at home. For those 89 children in preschool or grade school, their teachers also completed reports.

Each child was observed in the home for 30 min interacting with his or her mother and for 30 min with his or her father (or with mother only, in cases where there was no father living at home) on two occasions during a 1-week period (between 4:30 pm and 7:30 pm). If there was a participating parent who lived in a different home, the observation was carried out there as well. During these observations, an attempt was made to impose as little structure as possible; family members were asked to "do what you would normally do" (although talking to the observers, watching television, and talking on the telephone were prohibited).

Parent and Teacher Perceptions of Child Behavior

Parent perceptions of child adjustment were measured by the widely used parent forms of the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1991), the ECBI (Robinson et al., 1980), and the Parenting Stress Index (PSI; Abidin, 1983). On the ECBI, only the Intensity Score was used because the Total Problem Score was used as the screening

Table 3
Assessment of Child Social Problem Solving Before and After Treatment by Group

SPST-R variable ^a	CON				CT			
	Pre		Post		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Object acquisition categories								
No. of different positive solutions	3.95	1.56	3.59	1.53	4.30	1.71	5.15	1.35
Proportion of positive to negative solutions	0.81	0.20	0.75	0.28	0.79	0.27	0.83	0.18
Friendship categories								
No. of different positive solutions	2.18	0.80	1.95	0.95	2.30	1.10	2.75	0.98
Proportion of positive to negative solutions	0.80	0.26	0.75	0.27	0.76	0.28	0.91	0.15

Note. SPST-R, Social Problem-Solving Test—Revised. CON = waiting-list control; CT = child training; PT = parent training; CT + PT = combined child and parent training; ANCOVA = analysis of covariance; Pre = pretreatment; Post = posttreatment.
^{*}*p* < .05. ^{**}*p* < .01. ^{***}*p* < .001. †*p* < .10, statistically marginal effect.

criterion for entry into the study. For the PSI, we were interested in the Child Domain, which represented stress emanating from child characteristics.

Parent Daily Reports (PDR). The PDR (Chamberlain & Reid, 1987; Webster-Stratton & Spitzer, 1991) consists of a list of 19 negative and 19 prosocial behaviors commonly exhibited by children. At each assessment phase, mothers were asked to select those negative behaviors that they perceived as particular problems and those positive behaviors that they particularly wanted to increase. From this list, two summary scores were derived: a total target negative behavior score and total target positive behavior score. The individually tailored checklists derived at baseline were used as the basis for phone calls conducted twice a week for 2 weeks at baseline, immediately postintervention and at follow-up. During phone calls, the checklist was read to the mothers, who were asked to report on the occurrence or nonoccurrence of the target behaviors for the previous 24 hr. The number of negative and positive behaviors per 24 hr is averaged over the four calls, comprising two summary variables. In addition, the mothers were asked how many times they had spanked that day. Previous studies have reported interrater reliability ranging from .56 to .97, test-retest reliability of .75, and acceptable internal consistency (.59–.96).

Behar Preschool Behavior Questionnaire (PBQ). The PBQ (Behar, 1977) includes 30 items, each rated on a 0- to 2-point scale, and is completed by teachers. Factor analysis yields three subscales in addition to a Total Behavior Problem Scale. The Total Behavior Problem Scale was selected because it samples a broad range of conduct problems. Test-retest reliability has ranged from .60 to .99.

Assessments of Child Social Problem Solving

The Wally Child Social Problem-Solving Detective Game (WALLY) (Webster-Stratton, 1990) is derived from Spivak and Shure's (1985) Preschool Problem-Solving Test and Rubin and Krasnor's (1986) Child Social Problem-Solving Test. It is designed to assess both qualitative and quantitative dimensions of problem solving. The child is presented with 12 brightly colored illustrations of hypothetical problem situations involving "object acquisition" (i.e., how to obtain a desired object) and "friendship" (i.e., how to make friends with an unfamiliar person). The child is told that he or she is a "problem-solving detective" (each is given a Sherlock Holmes hat) and is asked to resolve the problems in the pictures. As each picture is presented, the child is asked what the character in the situation could do or say to solve the problem. The child is encouraged to give as many answers as he or she can for each situation. The answers are scored on the basis of type of solutions offered (prosocial or negative). Two summary scores are derived for the set of

pictures: the number of different positive solutions proposed and the ratio of positive to negative solutions. There are 16 prosocial solution categories (e.g., admit to accident, apologize, comply, devise another appropriate strategy, exert self-control, explain, give all to other, negotiate, share equally, wait) with satisfactory internal consistency, $\alpha = .55$. There are 17 negative solution categories (e.g., take all for self, deny authority of adult, deny, lie, destructive retaliation to object, grab or take object, hide evidence, physical negative to person, steal, tease or call names, threaten or coerce, yell, scream, stomp) with satisfactory internal consistency, $\alpha = .54$. The validity of WALLY has been established by showing that conduct-problem children use more aggressive strategies and, in the face of failure, are less flexible in thinking of alternative prosocial strategies. Interrater reliability for coding responses has been reported at 88%. Construct validity of the WALLY was established by showing satisfactory correlations between the WALLY total prosocial score and Rubin total positive strategies ($r = .60$) and between the WALLY negative score and Rubin negative strategies ($r = .50$).

Independent Observations of Parent Behaviors and Child Interactions With Parents

Dyadic Parent-Child Interactive Coding System—Revised (DPICS-R). The DPICS-R (Robinson & Eyberg, 1981) is a widely researched observational measure developed specifically for recording behaviors of conduct-problem children and their parents. The DPICS-R, which consists of 29 behavior categories, was used to code the parent-child interactions at home. For this study, we were interested in four parent variables: total commands and criticisms, total praise, positive affect, and negative valence. For the target child's behavior, two summary variables were formed: (a) total child deviance (sum of frequency of whine + yell + cry + physical negative + smart talk + aggression) and (b) total positive affect and warmth (sum of smiles, affectionate touch, and positive talk).

Home observations of parent-child interactions were made by 8 trained observers who were not informed of the treatment conditions of the patients. Before conducting home observations, the observers underwent extensive initial training and were required to maintain 80% reliability with practice tapes. It took approximately 4–6 months for observers to become reliable. To maintain accuracy, observers had weekly training sessions at which they coded videotaped interactions and discussed their coding. To periodically assess reliability, a second observer was present for at least 20% of all the home observations. Mean overall interrater agreement was 79% (range, 71% to 89%), and

PT		CT + PT				Four-group ANCOVA F	CT vs. CON	PT vs. CON	CT + PT vs. CON		
Pre		Post		Pre						Post	
M	SD	M	SD	M	SD					M	SD
3.80	1.78	3.96	1.51	4.68	1.43	5.14	1.25	6.47**	2.75***	1.02	3.29**
0.76	0.28	0.80	0.25	0.84	0.19	0.81	0.14	0.72	1.43	1.07	0.85
2.19	1.08	2.14	0.85	2.18	1.10	2.45	0.96	3.18*	2.86**	0.65	1.78†
0.73	0.27	0.79	0.22	0.75	0.28	0.85	0.17	2.96*	2.82**	0.71	1.58

the product-moment correlation calculated between observers ranged from .80 to .95 for the parent and child behaviors.

Parenting problem solving and collaboration (PS-I CARE). The Problem-Solving-Interaction Communication-Affect-Engagement Coding System (PS-I CARE) was developed (Webster-Stratton, King, & Hollinsworth, 1991) to record parenting problem-solving skills and marital collaboration. Couples were asked to choose two child behavior problems to discuss for 15 min while being videotaped. Coders rated videotapes of couples' problem solving on a dimension called collaboration. The 5-point scale ranged from *low collaboration* ([1] abrasive, dismissive, stonewalling) to *high collaboration* ([5] cooperative, mutually reinforcing, joint ownership of problem).

There were six extensively trained observers who were not informed of the hypotheses of the study. They scored standardized videotapes of couple interactions, achieving a criterion of 80% before formal data collection. Over 50% of the tapes were independently coded by a second coder to establish interrater reliability. Mean overall interrater reliability was 83%. The product-moment correlation calculated between coders was .86 for collaboration.

Independent Observations of Child Interactions with Peers

Each child was asked to visit our playroom with his or her best friend. The friend needed to be within 2 years of the target child's age and of the same sex. There were two sets of instructions given to the children during the 20-min observation. For the cooperative play segment, the children were instructed, "Make the best thing you can together." They were given one Etch-a-Sketch and a box of Lincoln Logs and were told that a photograph would be taken of their joint project when they had finished. For the competitive play segment we set up a situation of potential conflict between the target child and the friend. This was accomplished by taking the target child out of the room, ostensibly to show his or her parent the photo; meanwhile, the friend was given a video game to play and told he or she had only 10 more minutes to play. When the target child returned to the room, he or she found the friend involved in an exciting computer game with exclusive control of the game. In this study, we analyzed only the competitive segment of the interaction because we were interested in seeing what kinds of social problem-solving strategies the target child used and how he or she handled any conflict that arose.

The Peer Problem-Solving-Interaction Communication-Affect Rating Coding System (PPS-I CARE) coding system, a derivative of Gottman's MACRO and MICRO friendship observation measures (Gottman, 1986),

was developed by our staff specifically to evaluate the skills taught in our KIDVID intervention program, as well as to have a sensitive observational measure of changes in peer interactions. The coding system includes three main categories: total negative social skills, negative conflict management, and positive conflict management. The negative social skills category consists of nine items involving communication (e.g., disagreement, commands, criticisms, negative talk, demand attention). The negative conflict management category consists of 19 items, 11 of which are physically negative (e.g., grabbing object away, hitting other child, intruding in other child's space, destructive response, rule violations), and eight of which are verbally negative (e.g., threatening, crying, smart talking, yelling). The positive conflict management category consists of five items (explain or give reason for request, withdraw from conflict situation, ignore negative behavior of friend, offer a prosocial solution to the problem, and compromise). Because we analyzed the competitive play situation, for this study we were interested in only two variables: total number of negative conflict management strategies and the ratio of positive to negative conflict management strategies.

It took approximately 6 months of weekly training and practice for observers to become reliable. To assess reliability, a second coder analyzed 30% of all videotapes; these were randomly selected. The percent agreement reliability was calculated for each 5-min segment and was based on occurrence (not nonoccurrence) of observed behaviors. Mean overall interrater agreement was 79% (range, 69%–92%), and the intraclass correlations calculated between observers for the summary variables ranged from .74 for positive conflict management strategies to .92 for negative conflict management strategies.

Social Validity Measure

Our consumer satisfaction questionnaire, adapted from the work of Forehand and McMahon (1981) consisted of 21 items with a 7-point Likert scale response format. Parents were presented with written statements to which they responded by selecting a point on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Three subscales measured parents' perceptions of improvements in child behavior, format of treatment (e.g., ease of home assignments, notes to teachers), and usefulness of treatment. The internal consistency of the subscales ranged from .71 to .90.

Results

Treatment effects were evaluated by parent report measures of child behavior (ECBI, CBCL, PSI); teacher report measures

Table 4
 Child Observations at Home and Peer Interactions Before and After Treatment by Group

	CON				CT			
	Pre		Post		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Home and laboratory behavior observations								
Mother observations of target behaviors (PDR) ^a								
Target negative behaviors	9.77	3.65	7.45	2.79	10.56	2.90	4.30	2.16
No. negative per 24 hr	6.73	3.00	6.10	2.94	6.07	1.69	4.60	1.75
Target positive behaviors	10.50	5.24	7.18	3.95	12.74	3.65	5.11	2.94
No. positive per 24 hr	5.93	2.90	5.89	3.10	6.51	2.87	8.04	2.87
Home observation ^b								
Child total deviance								
With mothers	14.20	13.86	15.07	24.10	17.42	22.02	8.88	7.47
With fathers	9.88	7.07	8.79	14.05	15.78	22.16	6.81	7.20
Child positive affect and warmth								
With mothers	12.23	8.76	11.61	7.23	13.42	11.87	16.10	14.34
With fathers	15.44	18.19	11.32	11.18	8.81	7.61	15.53	11.94
Laboratory observation of children with peers ^c								
Total negative conflict management	6.45	6.80	8.09	7.70	5.81	5.42	3.59	4.93
Ratio of positive conflict management to negative	0.29	0.28	0.24	0.24	0.30	0.30	0.51	0.31

Note. CON = waiting-list control; CT = child training; PT = parent training; CT + PT = combined child and parent training; ANCOVA = analysis of covariance; Pre = pretreatment; Post = posttreatment; PDR = Parent Daily Report.

^aPDR, Mother observations at home (Chamberlain & Reid). ^bDPICS-R, Independent rater observations at home (Robinson & Eyberg, 1981).

^cPPS-ICARE, Peer Problem-Solving Interaction Communication Affect Rating (Webster-Stratton, 1991).

* $p < .05$. ** $p < .01$. *** $p < .001$. † $p < .10$, statistically marginal effect.

of child behavior (PBQ); maternal daily reports of targeted child behaviors and discipline (PDR); assessments of social problem solving (WALLY); independent observations of child behavior in the home with parents (DPICS-R) and with peers in the laboratory (PPS-ICARE); and parent consumer satisfaction. A four-group analysis of covariance (ANCOVA) design was used to evaluate treatment effects for each of the dependent variables, using pretreatment performance as the covariate. Significant effects were followed by preplanned contrasts (t statistics), comparing each treatment group. Second, three contrasts evaluated the relative effectiveness of the three treatment conditions.

The analysis of variance (ANOVAs) and chi-square analysis for dichotomous variables revealed no significant differences among the four groups on the demographic or family background variables (i.e., marital status, education, income, social class, child's sex and age); nor were there were any significant differences between groups at baseline for parent reports of child behavior (CBCL, ECBI, PSI), teacher reports of child behavior, or observations of child behavior in the home or laboratory.

Parent and Teacher Reports of Child Behavior Problems

Significant differences for each of the three mother report measures were obtained by four-group ANCOVA. Next, we compared each of the treatment conditions with the controls. For the CT condition, the improvement in child behavior problems as reported by mothers on two of the three measures (ECBI, PSI) was significantly greater than for control children. For the PT only and CT + PT combined treatment conditions, there

was significantly greater improvement in child behavior problems than for control children, according to all three mother report measures. For fathers, there was a similar pattern. Four-group ANCOVA revealed significant group differences according to all three father report variables of child behavior problems (CBCL, ECBI, PSI). Fathers in all three treatment conditions reported significant improvements in behavior problems on all three measures, compared with control fathers' reports.

When the three treatment groups were compared with each other, significantly fewer behavior problems were reported by PT mothers on the CBCL Total Problem score, $t(90) = -2.56$, $p < .05$, and lower stress on the PSI, $t(90) = -2.67$, $p < .01$, than were reported by CT mothers. There was a statistically marginal effect for CT + PT mothers to report fewer behavior problems on the CBCL, $t(90) = -1.88$, $p < .10$ than CT mothers. No significant differences among treatment groups appeared in father reports. There was, however, a trend ($p < .10$) for fathers from the PT condition to report fewer behavior problems on the ECBI than did CT fathers.

There was no significant four-group ANCOVA for teacher reports of behavior problems on the PBQ. See Table 2 for mean scores, standard deviations, F tests, and t tests for the report variables.

Mother Daily Observations of Targeted Child Behaviors

Significant differences between treatment and control groups on mothers' home observations of targeted positive and negative behaviors (on the PDR) were found according to a four-group ANCOVA. Mothers in all three treatment groups observed significantly fewer targeted negative behaviors and more prosocial

PT		CT + PT				Four-group ANCOVA F	Contrasts (<i>t</i>)				
Pre		Post		Pre			Post		CT vs. CON	PT vs. CON	CT + PT vs. CON
M	SD	M	SD	M	SD		M	SD			
10.15	3.26	3.27	2.68	10.45	3.31	3.91	3.01	16.74***	-5.26***	-6.52***	-5.51***
6.38	2.74	4.26	2.93	6.27	2.30	4.15	1.89	4.24**	-2.07*	-3.13**	-3.09**
12.73	5.42	5.12	4.97	12.59	4.78	4.27	2.93	10.05***	-4.28***	-4.23***	-5.01***
7.24	3.65	8.77	3.26	6.97	3.30	8.18	3.08	4.64**	3.16**	3.37**	2.61*
16.94	14.55	9.96	8.17	20.95	33.31	11.28	9.71	1.00	-1.64	-1.36	-1.05
16.03	9.02	7.21	7.69	18.19	25.55	8.51	6.62	0.21	-0.60	-0.47	0.02
11.04	9.01	19.42	18.87	6.70	6.88	19.58	17.14	1.91	0.94	1.91†	2.12*
13.00	8.91	20.38	14.65	9.84	7.82	15.31	12.95	1.80	1.44	2.30*	1.29
4.50	5.09	4.00	5.48	5.55	4.67	3.64	3.92	3.17*	-2.76**	-2.18*	-2.55**
0.34	0.34	0.29	0.33	0.21	0.21	0.40	0.38	3.37**	2.80**	0.38	1.84†

behaviors at home than control mothers. There were no significant differences among the three treatment conditions.

Assessments of Child Social Problem Solving

A four-group ANCOVA revealed significant group differences in one of the two scores for children's responses to hypothetical conflict situations on the WALLY. Comparisons revealed that, for the CT and CT + PT children, the improvement in the number of different positive solutions was significantly greater than for control children. There was no significant difference in the WALLY scores of children in the PT condition, compared with control children.

When the three treatment groups were compared with each other, CT and CT + PT children had a significantly higher number of different positive solutions than PT children, $t(91) = 2.29$, $p < .05$, and $t(91) = 2.14$, $p < .05$, respectively. Table 3 presents mean scores, standard deviations, *F* tests, and *t* values for this measure.

Independent Observations of Child Behavior at Home and With Peers

Assessments of children's interactions with their best friends (PPS-I CARE) revealed significant group differences for independent raters' observations of children's total negative conflict management skills and ratio of positive to negative conflict management according to four-group ANCOVA. For all three treatment conditions, the improvement in children's negative conflict management skills with peers was significantly greater than for control children. The CT children also showed a significantly higher ratio of positive to negative conflict management skills

than control children. There was a marginally significant change in the predicted direction for CT + PT children in their ratio of positive to negative conflict management skills, compared with controls. PT children showed no significant difference from controls on this variable.

Comparisons between the treatment conditions revealed that CT children used a significantly higher ratio of positive to negative conflict management strategies than the PT-only children, $t(90) = -2.37$, $p < .01$.

Home observations of child behaviors (DPICS-R) revealed no significant overall group differences in total child deviance and positive affect when interacting with mothers or fathers at home according to a four-group ANCOVA (see Table 4). For none of the treatment conditions was there any significant difference from controls in children's total deviant behavior at home. There was, however, a significant difference between control children and CT + PT children in terms of children's positive affect with mothers, and there was a marginally significant difference between control children and PT children in terms of positive affect with mothers. When children's interactions with fathers were examined, there was a significant difference between control and PT children in terms of positive affect. These data suggest that children in the PT and CT + PT conditions were more positive in their interactions with their parents than control children were. When the three groups were compared with each other, there were no significant differences in observed child behavior at home. However, because of the wide variability of child deviant behaviors in the home observations, we felt that the ANCOVA for this variable may be misleading and subsequently we used nonparametric analysis of a comparison of percent reduction in child deviant behaviors. This is discussed below (see *Clinical Significance*).

Table 5
 Parent Behavior Summary Scores Before and After Treatment by Group

Parent behavior	CON				CT			
	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
Total commands and criticisms								
Mother	40.43	16.74	43.48	21.51	49.29	30.49	37.90	24.46
Father	25.29	13.24	22.26	18.38	28.81	16.44	24.33	15.46
Total praise								
Mother	4.27	3.25	5.80	3.96	6.27	7.02	5.42	5.52
Father	2.56	4.04	3.18	3.26	3.00	3.18	4.17	5.55
Positive affect								
Mother	7.61	8.22	6.95	6.21	7.25	6.76	9.33	7.35
Father	9.06	12.88	6.41	6.63	4.42	4.53	7.42	5.72
Negative valence								
Mother	2.89	0.40	2.85	0.28	2.83	0.35	2.77	0.27
Father	2.85	0.37	2.78	0.25	2.85	0.19	2.66	0.30
Total spanks (PDR)								
Mother	0.38	0.97	0.62	1.20	0.22	0.51	0.07	0.27
Couple collaboration ^a	3.75	0.75	3.17	0.94	3.23	0.83	3.15	0.80

Note. CON = waiting-list control; CT = child training; PT = parent training; CT + PT = combined child and parent training; ANCOVA = analysis of covariance; Pre = pretreatment; Post = posttreatment; PDR = Parent Daily Reports.

^a This variable only applies to couples when there is a mother and partner involved with the child. For CON, $n = 12$; CT, $n = 13$; PT, $n = 13$; CT + PT, $n = 11$.

* $p < .05$. ** $p < .01$. † Statistically marginal ($p < .10$) effect.

Observations of Parenting Behavior at Home

A four-group ANCOVA yielded significant differences between groups in all four of the mother behavior variables (see Table 5). Next we compared each of the treatment conditions with controls. For mothers in the CT condition, only one of the four parenting behavior variables (namely, total criticisms and commands) significantly improved in comparison to mothers in the control group; there were no significant differences between control mothers and CT mothers in mother praise, positive affect, and negative valence. For mothers in the PT-only condition, all four parenting variables changed in the predicted direction compared with controls, and for the mothers in the CT + PT treatment conditions, three of the four variables changed in the predicted direction. When the treatment conditions were compared with each other, PT and CT + PT mothers had significantly more praise behaviors than CT mothers, $t(89) = 3.17$, $p < .01$, and $t(89) = 2.66$, $p < .01$.

Four-group ANCOVA also revealed (by means of the PDR) a significant effect for mothers' use of spanking. For the CT + PT condition, there were significant differences compared with control mothers' daily reports. There was no significant difference among the three treatment conditions.

For fathers, the pattern was similar, although there were no significant differences between the CT condition and controls on any of the CT parenting behavior variables. For fathers in the PT condition, three of the four parenting behavior variables changed in the predicted direction, compared with control fathers. For fathers in the CT + PT condition, only one variable (praise) was marginally significant when compared with controls. When the treatment conditions were compared with each other, PT fathers had significantly more positive affect and lower

negative valence than CT + PT fathers, $t(63) = -2.07$, $p < .05$, and $t(63) = 2.00$, $p < .05$, respectively. PT fathers showed a marginally significant increase ($p < .10$) in praise statements compared with CT fathers.

Finally, for observations of couples' collaboration skills when discussing their child's problems, four-group ANCOVA was significant. CT + PT showed significantly more collaboration skills than controls, $t(44) = 2.73$, $p < .01$. CT parents showed no significant differences compared with controls. Further analysis indicated that for both conditions that included PT, parents showed significantly more collaboration skills than parents who had not received PT (i.e., CT treatment and controls), $t(46) = 7.14$, $p < .01$.

Clinical Significance

Along with statistical significance, a major concern is the extent to which the treatment conditions produced clinically significant improvements (Schmaling & Jacobson, 1987). We used several conservative criteria to assess the clinical significance of the findings. We used mother data as the basis for four of our criteria because of the smaller sample size of fathers; moreover, the results for father data were very similar to those for mothers. We did not use teacher data as a basis for determining clinical significance because only 59% of the teacher reports at baseline were in the clinical range. Our four criteria for clinical significance were (a) a t score of less than 60 on the mothers' CBCL (this t score has been identified by Achenbach and Edelbrock, 1991, as the cutoff point between normal and clinic samples); (b) a reduction in targeted child negative behaviors of at least 30% as reported by mothers (PDR); (c) a decrease in mother criticisms of at least 30% (DPICS-R); and

PT				CT + PT				Four-group ANCOVA <i>F</i>	Contrasts (<i>t</i>)		
Pre		Post		Pre		Post			CT vs. CON	PT vs. CON	CT + PT vs. CON
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
55.06	35.84	36.35	24.17	45.25	28.95	35.17	16.44	2.87*	-1.99*	-2.84**	-2.02*
38.85	36.34	26.91	13.42	42.69	26.32	29.31	19.70	0.11	0.24	-0.30	0.56
5.29	4.48	9.25	6.52	4.58	3.65	8.48	5.34	4.33**	-0.96	2.07*	1.67
3.12	2.38	7.47	6.53	2.81	2.29	6.91	7.26	2.12	0.41	2.06*	1.82†
8.15	5.23	12.17	8.25	3.65	4.21	10.15	8.99	3.00*	1.32	2.49*	2.59*
4.41	4.40	9.79	10.96	4.31	4.64	5.03	4.88	2.45†	1.44	2.45*	0.39
2.88	0.30	2.56	0.32	3.01	0.32	2.71	0.32	4.89**	-0.69	-3.51**	-2.00*
2.87	0.23	2.59	0.35	2.93	0.25	2.80	0.20	2.11	-1.36	-2.16*	-0.12
0.68	1.82	0.04	0.20	0.75	0.97	0.35	0.93	3.60*	-2.52*	-3.12**	-1.59
2.92	0.64	3.38	0.96	3.09	0.94	3.82	0.98	2.90*	0.74	1.80†	2.73**

(d) a reduction in total child deviance of at least 30% (DPICSR). The figure of 30% was based on previous studies of conduct-problem children, which reported 30% reductions as indicators of treatment success (Webster-Stratton et al., 1989). Both observational and report data were chosen as criteria in order to avoid reliance on a single criterion measure and to provide validity to the findings.

Mother reports of child behavior in normal range. Immediately posttreatment, 80.8% of PT mothers and 70.0% of the CT + PT mothers reported clinically significant changes in their child's behavior (CBCL) into the normal range on the CBCL, as compared with 37.0% of CT mothers and 27.3% of control mothers. Chi-square analyses comparing each treatment condition to the control condition were significant for the PT condition, $\chi^2(1, N = 48) = 13.86, p < .001$, and for the CT + PT condition, $\chi^2(1, N = 42) = 7.67, p < .01$, in comparison to controls, but not for the CT condition.

Improvements in mother and child behaviors. Immediately posttreatment, there was a 30% reduction in targeted child negative behaviors as reported by mothers (on the PDR) for 88.9% of CT children, 92.3% of PT children, and 90.9% of CT + PT children, in comparison with 27.3% of control children. All three treatment conditions were significantly different ($p < .001$) from control according to chi-square analysis. Independent observations of children interacting with their mothers showed a reduction in total deviant behaviors of at least 30% for 73.1% of CT children, 73.1% of PT children, 60.0% of CT + PT children and 54.5% of control children. Chi-square analysis of percent reduction for each treatment condition compared with controls was not significant.

In regard to mother behaviors, 45.5% of CT mothers, 68.2% of PT mothers, and 71.4% of CT + PT mothers showed a

reduction in criticisms of at least 30%, compared with 27.8% of control mothers. Chi-square analysis indicated significant differences for the PT and CT + PT conditions as compared to control mothers, $\chi^2(1, N = 48) = 5.19, p < .05$, and $\chi^2(1, N = 42) = 4.75, p < .05$.

Consumer Satisfaction

Overall consumer satisfaction with the program was high, with 92.6% of CT mothers, 90% of CT fathers, and 95% of PT and CT + PT mothers and fathers reporting "positive" to "very positive" improvements in children's behaviors as a result of the training program. In terms of mothers' overall satisfaction, a three-group ANCOVA revealed a trend for group differences, $F(2, 70) = 2.74, p < .10$. Range tests indicated that the two treatment conditions that included the PT intervention were not significantly different from each other, so they were combined to determine whether they differed from the CT condition. *t* tests indicated that mothers in the PT and CT + PT condition had higher satisfaction scores than mothers in the CT-only condition, $t(71) = -2.35, p < .05$. Similar results were found for fathers. Overall ANOVA showed a trend, $F(2, 50) = 2.80, p < .10$. Further analysis found that CT fathers rated the program significantly lower than the two conditions that included PT, $t(51) = -2.21, p < .05$.

One-Year Follow-Up

One year after the completion of posttreatment assessments, 89% of the CT children (3 refused to participate) and 100% of the CT + PT and PT children were reassessed by means of parent and teacher reports, home observations and social prob-

Table 6
Assessment of Child Behaviors Pretreatment, Posttreatment, and 1-Year Follow-Up

Behavior	CT							
	Pre		Post		F/U		Pre	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Parent and teacher reports								
CBCL total behavior problems								
Mother	67.00	7.78	61.71	9.33	58.57	10.65	65.28	7.89
Father	62.88	7.82	56.50	11.18	54.75	13.11	62.19	7.90
ECBI intensity score								
Mother	154.05	27.50	123.77	24.26	117.73	32.93	165.32	23.47
Father	148.00	16.30	123.00	19.22	114.81	27.71	154.25	19.47
PSI child domain								
Mother	137.12	25.55	127.29	22.50	129.82	28.83	142.46	19.47
Father	133.00	20.84	118.85	20.28	120.54	27.98	125.47	14.16
Teacher reports								
PBQ total problems	21.00	11.78	14.96	11.55	18.42	12.00	15.73	10.91
Mother observations (PDR)*								
Target negative behaviors	10.67	2.59	4.33	1.88	4.76	3.13	10.00	3.23
Target positive behaviors	13.24	3.11	5.38	3.11	6.19	3.39	12.76	5.53
Independent child assessments								
WALLY social problem-solving								
No. of different positive solutions	5.68	2.33	7.63	2.24	8.32	2.06	5.59	2.32
No. of positive-to-negative solutions	0.66	0.30	0.79	0.22	0.80	0.20	0.66	0.27
Child total deviance								
With mother	18.95	23.59	7.16	5.73	7.89	8.22	17.27	15.16
With father	16.73	24.24	5.73	6.07	5.50	5.90	16.54	9.01
Child positive affect and warmth								
With mother	11.34	10.39	17.00	15.51	18.00	16.62	11.25	9.71
With father	9.23	8.28	16.13	12.97	11.50	7.38	14.71	8.84

Note. CT = child training; PT = parent training; CT + PT = combined child and parent training; ANOVA = analysis of variance; F/U = follow-up; Pre = pretreatment; Post = post-treatment; CBCL = Child Behavior Checklist; ECBI = Eyberg Child Behavior Inventory; PSI = Parenting Stress Index; PBQ = Preschool Behavior Questionnaire; PDR = Parent Daily Reports; WALLY = Wally Child Social Problem-Solving Detective Game.

* PDR, Mother observations at home. Decrease in targeted positive behavior (behaviors want to see more of) reflect an increase in observed positive behaviors.

* $p < .05$ ** $p < .01$. *** $p < .001$. † Statistically marginal ($p < .10$) effect.

lem-solving skills assessments. Follow-up analysis consisted of a repeated measures ANOVA with three groups (CT, PT, CT + PT) and three times (pretreatment, posttreatment, and follow-up) to determine time and Time \times Group interaction effects. If the analysis revealed a significant time effect, then the following planned contrasts (t statistics) were conducted: (a) pretreatment versus 1-year follow-up and (b) immediate posttreatment versus 1-year follow-up. Where there was a significant Time \times Group interaction, we analyzed the time effects for each group separately.

A repeated measures ANOVA revealed significant time effects ($p < .01$) for all the mother and father report variables (PDR, CBCL, ECBI, PSI). When we compared 1-year follow-up report data with baseline pretreatment scores, mothers and fathers from all three treatment groups reported significantly ($p < .001$) fewer child behavior problems (CBCL, ECBI) and lower parenting stress levels (PSI). On the PDR reports, mothers from all three treatment groups reported significantly fewer targeted negative behaviors, fewer targeted prosocial behaviors (reflecting an increase in observed positive behaviors), and less spanking than at baseline. We found only one borderline Group \times Time interac-

tion, namely, for the child domain measure on the mothers' PSI, $F(4, 116) = 2.34$, $p < .10$. Further analysis indicated that the levels of stress attributable to child characteristics had dropped significantly from pretreatment to 1-year follow-up for PT and CT + PT mothers, whereas CT mothers did not report significant change. Contrasts between posttreatment and 1-year follow-up were not significant for any of the parent report variables, suggesting stability of these measures after treatment.

Assessments of children's social problem-solving skills through a repeated measures ANOVA revealed significant time effects for both scores on the WALLY measure; for number of different positive strategies, $F(2, 120) = 20.54$, $p < .001$; for ratio of positive to negative strategies, $F(2, 120) = 4.50$, $p < .05$. When we compared 1-year follow-up tests with baseline pretreatment scores, children from all three treatment groups showed a significantly greater number of different positive strategies proposed in response to hypothetical situations, as well as a higher ratio of positive to negative strategies. There were no significant differences on these measures between posttreatment and follow-up.

Analysis of home observations of child behavior by repeated

PT		CT + PT								Repeated measures ANOVA F	Contrasts (t)	
Post		F/U		Pre		Post		F/U			Pre vs. 1-year F/U	Post vs. 1-year F/U
M	SD	M	SD	M	SD	M	SD	M	SD			
55.32	8.40	55.08	10.55	65.30	6.11	57.05	7.66	57.70	8.72	42.78***	7.84***	ns
53.75	9.04	53.50	8.94	66.19	7.75	57.44	10.26	57.00	11.34	30.48***	6.30***	ns
118.72	28.28	119.28	31.69	161.55	33.43	121.40	24.25	112.15	32.93	74.42***	9.83***	ns
110.56	26.91	108.31	40.05	150.19	26.73	123.13	24.20	114.56	31.86	43.08***	7.65***	ns
117.13	19.55	117.13	25.57	141.75	18.65	126.30	17.38	122.10	24.51	26.25***	6.09***	ns
109.67	17.62	106.73	13.54	130.44	19.52	115.06	18.03	114.88	26.07	19.54***	4.95***	ns
15.32	7.88	18.86	9.68	25.82	14.35	16.00	11.62	21.71	11.97	7.69**	ns	-3.06**
3.24	2.73	3.88	3.18	10.45	3.31	3.91	3.01	3.45	2.86	214.48**	16.39***	ns
5.12	5.07	4.40	3.14	12.59	4.78	4.27	2.93	4.00	3.28	229.05***	17.24***	ns
6.64	1.99	7.68	1.49	6.73	2.31	8.32	1.96	8.32	2.12	20.54***	-6.59***	ns
0.73	0.21	0.75	0.21	0.77	0.25	0.79	0.17	0.81	0.11	4.50*	-2.76**	ns
10.27	8.68	8.75	8.18	20.95	33.31	11.28	9.71	4.47	3.63	11.81***	3.82***	2.08*
8.25	8.09	6.46	4.98	18.19	25.55	8.81	6.62	4.56	3.90	10.19***	3.59**	1.81†
20.14	20.39	20.50	15.84	6.70	6.88	19.58	17.14	18.05	12.03	9.69***	-4.46***	ns
21.86	15.22	25.36	14.77	9.84	7.82	15.31	12.95	16.63	16.01	5.67**	-3.06**	ns

measures ANOVA revealed significant time effects for child deviance with both mothers and fathers, $F(2, 116) = 11.81, p < .001$, and $F(2, 84) = 10.19, p < .001$, respectively; and for child positive affect and physical warmth toward mothers and fathers, $F(2, 116) = 9.69, p < .001$, and $F(2, 84) = 5.67, p < .01$, respectively. When we compared 1-year follow-up home observations with pretreatment observations, all three treatment groups exhibited significantly lower levels of total child deviant behaviors and higher levels of positive affect and physical warmth. In addition, contrasts between posttreatment and 1-year follow-up were significant ($p < .05$) for child deviant behaviors with mother and marginally significant ($p < .10$) for child deviant behaviors with father, indicating that the children showed continued improvements in the year following treatment. Thus the independent observations of children's behaviors corroborated the parents' reports of improved child adjustment 1 year later.

In regard to home observations of parent behavior, a repeated measures ANOVA revealed significant ($p < .01$) time effects for all four parenting variables (command plus criticals, praise, positive affect, and valence) for mothers and fathers. When we

compared 1-year follow-up home observations with pretreatment observations, all three treatment groups showed fewer commands and criticisms, less negative valence, and more positive affect. There was a significant Group \times Time interaction for mother praise, $F(4, 116) = 2.90, p < .05$. Further analysis of pretreatment versus follow-up data revealed that PT and CT + PT mothers were observed to have significantly higher levels of praise, whereas CT mothers did not show significant change. Nonsignificant results from comparisons of observed parent behavior at posttreatment versus follow-up suggest maintenance of treatment effects in the year following treatment. Means and standard deviations for pretreatment, posttreatment and 1-year follow-up assessments for the treatment groups are presented in Table 6 and Table 7.

Repeated measures ANOVA of teacher reports of child behavior revealed a significant time effect, $F(2, 120) = 7.69, p < .01$, for the whole group of children but no Group \times Time interaction. Further analysis with the subsample of 54 children who had teacher PBQ scores in the abnormal range at pretest revealed a significant improvement from pretest to 1-year follow-up, $t(74) = 2.95, p < .01$ for all three groups.

Table 7
Assessment of Parent Behaviors at Home Pretreatment, Posttreatment, and 1-Year Follow-Up

Parent behavior	CT						PT			
	Pre		Post		F/U		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total commands and criticisms										
Mother	45.42	33.08	35.29	24.55	35.32	21.62	52.86	26.73	33.84	19.22
Father	24.40	13.74	20.93	13.61	24.97	16.71	43.04	38.97	27.00	14.58
Total praise										
Mother	5.95	7.07	4.82	5.54	4.95	6.16	5.23	4.82	9.41	6.83
Father	3.27	3.37	3.53	5.05	4.40	3.39	3.25	2.59	7.43	7.02
Positive affect										
Mother	6.97	7.13	9.45	7.89	11.21	9.84	8.43	5.39	12.82	8.73
Father	4.57	4.91	6.97	6.18	8.37	6.94	5.11	4.53	10.75	11.60
Negative valence										
Mother	2.86	0.36	2.72	0.29	2.77	0.29	2.87	0.32	2.52	0.33
Father	2.84	0.20	2.67	0.30	2.77	0.22	2.87	0.24	2.55	0.35

Note. CT = child training; PT = parent training; CT + PT = combined child and parent training; ANOVA = analysis of variance; F/U = follow-up; Pre = pretreatment; Post = posttreatment.

* $p < .05$. ** $p < .01$. *** $p < .001$. † Statistically marginal ($p < .10$) effect.

Clinical Significance of Follow-Up Assessments

The clinical effectiveness of the three interventions 1 year later was measured by percent reduction in total child deviant behaviors as observed at home. We chose this outcome variable because it represented the least biased measure (as opposed to parent reports) and because problem behaviors at home were the original cause of parents seeking professional help. At 1-year follow-up, there was a reduction of at least 30% from pretreatment levels in deviant behaviors when interacting with their mothers for 73.7% of CT children, 60.0% of PT children, and 95% of CT + PT children. The percentage of children who achieved a 30% reduction in deviant behaviors was significantly greater for the CT + PT condition than for the PT condition, $\chi^2(1, N = 42) = 7.45, p < .01$. In addition, there was a marginally significant trend for the percentage of children who showed a 30% reduction at follow-up to be greater in the CT + PT condition than in the CT condition, $\chi^2(1, N = 39) = 3.40, p < .10$. Further analysis using the McNemar test for the significance of change showed that a significant number of children in the CT + PT group who had not shown a 30% reduction in child deviance at posttreatment did so at follow-up, $\chi^2(1, N = 19) = 4.0, p < .05$.

Consumer Satisfaction at Follow-Up

A repeated measures Group (CT, PT, CT + PT) \times Time (Posttreatment and Follow-Up) ANOVA showed no significant changes over time in either mothers' or fathers' overall satisfaction with the program and no significant interactions between group and time. Overall satisfaction continued to be high at follow-up, with 95.2% of mothers and 100% of fathers reporting improvements in children's behavior.

Discussion

The purpose of this study was to compare the treatment outcomes of three intervention models targeting different risk fac-

tors. In general, effects on risk factors reflected the type of intervention the families had received. Intervention that involved PT was superior to CT in terms of child behavior improvements (as reported by parents), parent behaviors (as observed by independent raters) and consumer satisfaction. Intervention which involved child training was superior to parent training in terms of child social problem-solving and conflict management skills (as tested and observed, respectively).

All three treatment groups of parents reported highly significant improvements in their children's behaviors (CBCL, ECBI, PSI, and PDR). Moreover, independent observations of children's interactions with peers in the laboratory showed significant improvements in conflict management skills for all three treatment groups, compared with control children. Differences in the efficacy of the three interventions emerged when child social problem-solving tests and home observations were analyzed. Assessments of social problem solving showed a significantly greater number of different positive solutions for both CT and CT + PT treatment groups, compared with control children, but no improvement was due to the PT treatment. Children from the CT + PT group showed significantly higher levels of positive affect when interacting with their mothers, as did PT children when interacting with their fathers, whereas children from the CT group did not show any difference from control children in their interactions with parents. Mothers in the PT and CT + PT groups and fathers in the PT group showed significant improvements on three of the four parent variables in their interactions with their children, whereas CT mothers changed on one variable and CT fathers showed no changes in their behavior.

When CT + PT combination was compared with either condition alone, the unique contribution of each intervention becomes clear. The combined training was superior to CT in terms of improvements in parenting behaviors (i.e., mother praise and couple collaboration) and child behavior problems. The combined training was superior to parent training in terms of in-

F/U		CT + PT						Repeated measures ANOVA F	Contrasts (<i>t</i>)	
		Pre		Post		F/U			Pre vs. 1-year F/U	Post vs. 1-year F/U
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
33.55	18.50	45.25	28.95	35.17	16.44	31.33	16.22	13.91***	4.38***	<i>ns</i>
30.71	13.03	42.69	26.32	29.31	19.70	31.28	23.38	4.23*	1.73†	<i>ns</i>
9.57	9.65	4.58	3.65	8.48	5.34	7.68	7.08	5.23**	-2.29*	<i>ns</i>
8.14	9.02	2.81	2.29	6.91	7.26	4.97	5.00	6.09**	-2.83**	<i>ns</i>
13.77	14.69	3.65	4.21	10.15	8.99	12.15	11.51	11.48***	-4.40***	<i>ns</i>
11.07	8.58	4.31	4.64	5.03	4.88	6.09	8.47	7.67**	-3.55**	<i>ns</i>
2.53	0.31	3.01	0.32	2.71	0.32	2.71	0.46	17.80***	5.68***	<i>ns</i>
2.59	0.35	2.93	0.25	2.80	0.20	2.82	0.23	11.20***	3.19**	<i>ns</i>

creasing children's social problem-solving skills. Thus, the combined intervention produced more significant improvements across a broader range of outcome variables: improved parent reports of behavior problems, parent-child interactions at home, as well as child social problem-solving skills, conflict management strategies with peers, and consumer satisfaction.

It is encouraging to find that, at 1-year follow-up, all the significant findings noted immediately posttreatment were maintained. Moreover, child deviance at home (as independently observed), which had not shown a statistically significant reduction when compared with controls immediately posttreatment, showed a significant reduction over time for all three treatment conditions, particularly for the CT + PT children. Analysis of the clinical significance of the three interventions also suggested the superiority of CT + PT condition, which resulted in a reduction in child deviance of at least 30% for 95% of the children, compared with 59.1% of the PT children and 73.7% of the CT children. This suggests a "delayed" effect for the combined intervention so that when intervention addresses both parent and child risk factors, the improvements in both sets of factors apparently reinforce each other over time to produce less child deviance at home. Nonetheless, despite the relative superiority of CT + PT over PT or CT alone, the combined treatment intervention did not produce enhanced effects in terms of behavior problems at school as reported by teachers.

There are several possible explanations for the failure of these interventions to produce improvements in behavior in the school setting. First, teachers were not directly involved in the intervention. In all three interventions, information about the training program and suggestions for behaviors that teachers could reinforce in the classroom were mailed to teachers once a month. However, there was no monitoring of whether teachers followed these suggestions (or even read the information). Thus, it seems likely that the treatment program did not sufficiently impact the classroom.

Alternatively, the failure of any of the interventions to produce

behavioral changes in the school setting may be attributable to the fact that only 60% of the children actually had behavior problems at school in the clinical range according to teacher reports on the PBQ. This is typical of the setting specificity and instability of conduct problems at this young age (Egeland, Kalkoske, Gottesman, & Erickson, 1990); our data on well over 600 children (4-7 years old) diagnosed with ODD or CD have suggested that only 50% to 60% of the young children with conduct problems at home will show cross-setting stability of the aggressive behaviors. A low baseline rate of behavior problems (as based on teacher reports) creates a floor effect, making it difficult to determine significant improvements in the behavior of the small sample that does have abnormal ratings at baseline. Nonetheless our post hoc analyses of the subsample of children who were in the clinical range pretest indicated a significant overall decrease from pretreatment to 1-year follow-up but no individual group differences.

Of particular interest in this study were the findings relating to the CT intervention. Our CT program led to significant improvements in conduct problems and in social problem solving as measured by parent reports of behavior at home, independent assessments of child social skills in the clinic, and observations of child behaviors at home and with peers. Consumer satisfaction measures indicated that parents perceived the program as highly acceptable and useful for their children in terms of overall behavior improvements. Our data indicate that the social problem-solving skills learned in the program and demonstrated by the children when tested were actually used when the children were faced with a real conflict situation with a friend. Moreover, improvements in child social skills and conduct problems were noted by both mothers and fathers at home, suggesting that the skills learned in the clinic generalized to the home and were maintained over time. Analysis of the clinical effectiveness of the program indicated that at 1-year follow-up the behavior problems of approximately two thirds of the children were in the normal rather than the abnormal range (according to parent

reports on CBCL and ECBI), and 75% showed a 30% decrease from baseline levels in observed deviant behaviors at home. These findings would seem to contradict the earlier findings that suggested that younger children, as well as more aggressive children, are relatively unaffected by child social skills and problem-solving training (e.g., Coie, 1990).

Should we continue to develop child training programs as an independent intervention for children with conduct problems, given our findings of the relative superiority of CT + PT? Yes. For it is undeniable that some parents will not participate in parent training programs, for any number of reasons—the length of time involved (15–22 sessions), the associated costs, the inconvenience, scheduling constraints, unwillingness, opposition. In such cases, the CT program is the only possible avenue for intervening with the conduct-problem child. CT programs can be offered at school or preschool to children whose parents are unable or unwilling to participate in PT programs.

Several limitations of this study deserve comment. First, because the control group was subsequently treated, it is difficult to determine whether long-term changes were due to maturation or to treatment per se. For ethical reasons, we did not feel that we could deny families treatment for longer than 9 months. Secondly, our sample size did not allow us to determine the characteristics of the children who failed to benefit from intervention. A larger treated group in each condition would permit analysis of whether particular child factors (e.g., ADHD, gender, developmental delays) or parent factors (e.g., maternal depression, life stress) might predict a child's ability to respond to a CT or PT approach. Perhaps different treatment approaches are best suited to different types of families or different conduct problems.

Its limitations notwithstanding, the present study suggests that an interactive, videotape modeling, multimodal child training program holds promise for helping young children with conduct problems learn to modify their aggressive responses and to use more appropriate social skills and that it also can be used to increase the effectiveness of PT—specifically, to produce more direct changes in children's social problem solving and peer interactions. The results warrant the continued development and evaluation of CT programs for children with early-onset conduct problems.

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Received December 29, 1995

Revision received February 28, 1996

Accepted February 28, 1996 ■