

Cognitive Problem-Solving Skills Training and Parent Management Training in the Treatment of Antisocial Behavior in Children

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This study evaluated the effects of problem-solving skills training (PSST) and parent management training (PMT) on children ($N = 97$, ages 7-13 years) referred for severe antisocial behavior. Children and families were assigned randomly to 1 of 3 conditions: PSST, PMT, or PSST and PMT combined. It was predicted that (a) each treatment would improve child functioning (reduce overall deviance and aggressive, antisocial, and delinquent behavior, and increase prosocial competence); and (b) PSST and PMT combined would lead to more marked, pervasive, and durable changes in child functioning and greater changes in parent functioning (parental stress, depression, and overall symptoms). Expectations were supported by results at posttreatment and 1-year follow-up. PSST and PMT combined led to more marked changes in child and parent functioning and placed a greater proportion of youth within the range of nonclinic (normative) levels of functioning.

Antisocial child behavior includes aggressive acts, theft, vandalism, fire setting, lying, truancy, running away, and other acts that violate major social rules and expectations. A persistent pattern of antisocial behavior, referred to as *conduct disorder*, affects diverse domains of current functioning and for many youth portends continued dysfunction in adulthood (see Robins, 1981; Rutter & Giller, 1983). Several characteristics underscore the clinical and social significance of conduct disorder. The prevalence rate is relatively high and encompasses 2 to 6% of school-age children (Institute of Medicine [IOM], 1989). In the United States alone, this translates to between 1.3 and 1.8 million cases. In addition, among children and adolescents, conduct disorder and aggressive and antisocial behaviors encompass one half to one third of all clinic referrals and lead the list of dysfunctions seen in clinical practice (see Kazdin, 1987a). Several longitudinal studies indicate that conduct disorder is relatively stable over time, portends diverse problems in adulthood (e.g., criminal behavior, alcoholism, and poor work adjustment), and often continues across generations (see Pepler & Rubin, 1991; Robins & Rutter, 1990).

Among the challenges to treatment is the range of dysfunctions that antisocial youth display. In addition to their antisocial symptoms, youth often evince hyperactivity, cognitive deficits and distortions, poor peer relations, and academic dysfunction.

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Moreover, parent psychopathology and multiple sources of stress (e.g., socioeconomic disadvantage, marital discord, single-parent families, and large family size) are commonly associated with conduct disorder. Diagnostically, conduct disorder is based on symptoms the child presents. Clinically, however, one is often confronted with a "package" involving parent, family, and socioeconomic factors in which child dysfunction is embedded.

Parent and family characteristics are fundamentally related to antisocial child behavior. Parental stress, psychopathology, and social isolation, poor parental relations, and related factors affect the onset, escalation, and maintenance of antisocial behavior (Pepler & Rubin, 1991; Robins & Rutter, 1990). While research continues to unravel the specific ways in which parent and family influences operate, treatment implications are already evident. For antisocial children, parent dysfunction and family adversity predict dropping out of treatment, degree of therapeutic change among those who remain, and maintenance of treatment gains among those who change (e.g., Dumas & Wahler, 1983; Kazdin, 1990; Patterson, 1986; Webster-Stratton, 1985). Thus, added and related to the task of reducing antisocial child behavior is the need to contend with parent and family issues that materially affect treatment process and outcome.

The scope of dysfunction in children, parents, and families makes conduct disorder a haven for diverse conceptual approaches to treatment. Central constructs from different therapeutic approaches (e.g., poorly developed superego, cognitive deficits, behavioral excesses, poor parenting skills, and untoward family dynamics) can be readily applied to conduct disorder and can serve as a reasonable warrant for treatment selection. However, few treatments have actually documented change with clinically referred antisocial youth (see Brandt & Zlotnick, 1988; Kazdin, 1985). Among the available treatments, cognitively based problem-solving skills training (PSST) and parent management training (PMT) are particu-

larly promising. Each approach has a conceptual model relating specific processes to disruptive and antisocial behavior, research evaluating these processes, and outcome evidence showing change with disruptive children (for reviews, see Dumas, 1989; Kazdin, 1987b; Kendall, 1991; Miller & Prinz, 1990). For these treatments, however, evidence is still far from complete. The specific role of central concepts (e.g., various cognitive processes and parenting practices) in generating and sustaining antisocial behavior, the connection between model-specific processes and therapeutic change, and the integration of influences outside of the specific models raise significant questions. Cognitively based treatment and parent training have reduced aggression and antisocial child behavior at home and at school in several studies, noted in the reviews cited above. Here, too, however, fundamental questions remain. Treatment effects are not always replicated; treatment often leaves children with deviant behavior above the range of normative levels; and gains achieved with treatment are not invariably maintained. Clearly, the need remains for more reliable, potent, and durable therapeutic interventions for antisocial youth.

Understandably, the search for effective interventions begins with evaluation of a specific treatment directed toward salient features of antisocial child behavior. Yet, given the scope of dysfunction, combinations of treatments that address interrelated domains warrant special attention in maximizing therapeutic change (IOM, 1989). There are a number of reasons PSST and PMT might be worth combining. To begin with, the treatments are conceptually complementary. PSST focuses on the individual child and the cognitive-behavioral repertoires he or she brings to diverse interpersonal situations; PMT focuses on child-rearing practices, parent-child interactions, and contingencies that can support prosocial behavior at home and at school. The concurrent focus on cognitive processes of the child, parent-child interaction, and external contingencies to support prosocial child behavior might act in concert and surpass the impact of either PSST or PMT alone.

Another reason for combining these treatments pertains to the potential impact on parent and family functioning. Parents of conduct disordered children engage in inept child-rearing practices and interaction patterns that sustain and escalate child dysfunction (e.g., Patterson, 1986; Patterson, Capaldi, & Bank, 1991). A child-focused treatment, even if effective, may leave unaddressed parenting practices and interactions that contribute to child dysfunction. Maternal stress, depression, and related symptoms contribute to these interactions and in a reciprocal way are likely to be exacerbated by them (e.g., Dumas & Gibson, 1990; Patterson, 1986). Occasionally, PMT has been shown to reduce parental stress and symptoms of dysfunction (Kazdin, 1985; Miller & Prinz, 1990). Thus, a parent-based component of treatment might not only augment change in the child but also affect parent and family domains on which improvement and maintenance partially depend.

The present study evaluated three treatments, namely, PSST, PMT, and their combination (PSST + PMT). Previous research has indicated that PSST and PMT as separate treatments can lead to therapeutic change. Because of their combined and complementary foci, we expected PSST + PMT to lead to more marked, pervasive, and durable changes in antisocial behavior and other areas of child functioning than either constituent

treatment alone. We also expected that PSST + PMT would decrease maternal stress and symptoms of dysfunction and improve family relations.

Method

Participants

Child characteristics. The participants consisted of 97 children (21 girls and 76 boys) referred for treatment to a psychiatric facility that provides services for children, adolescents, and adults. Children referred for aggressive and antisocial behavior were seen at the Child Conduct Clinic, an outpatient service from which the present participants were drawn. Children were included if (a) they were referred to treatment for fighting, unmanageability at home or at school, stealing, running away, truancy, or related antisocial behaviors; (b) they were rated by their parent or guardian above the 90th percentile on either the aggression or delinquency scale of the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983); (c) they were 7 to 13 years of age; (d) they read at or above the second grade level on the Wide Range Achievement Test (WRAT; Jastak & Jastak, 1978); (e) they showed no evidence of neurological impairment, uncontrolled seizures, or dementia; (f) were not receiving psychotropic medication; and (g) both child and parent (or guardian) provided consent. (The reading criterion was invoked because some of the treatment tasks and materials in PSST require rudimentary reading skills.)

The children who met screening criteria ranged in age from 7 to 13 years ($M = 10.3$). Full-scale Wechsler Intelligence Scale for Children—Revised (WISC-R; Wechsler, 1974) intelligence quotient, estimated from Vocabulary and Block Design subtests obtained at intake assessment, ranged from 62 to 135 ($M = 98.4$). Sixty-seven (69.1%) children were White; 30 (30.9%) were Black. Diagnoses of the children, based on criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R; American Psychiatric Association, 1987), were obtained from direct structured interviews conducted separately with the child and their parent(s) prior to treatment. Reliability of the diagnostic interviews was not assessed. On the basis of these interviews, two staff (a child psychiatrist and a social worker) discussed and reached agreement on the primary (principal) diagnosis for each child. Principal Axis I diagnoses included conduct disorder ($n = 48$), oppositional disorder ($n = 40$), attention-deficit hyperactivity disorder ($n = 3$), adjustment disorder ($n = 4$), and various other mental disorders ($n = 6$). The interviews assessed a broad range of symptoms as well as duration criteria to permit delineation of a range of disorders beyond the principal diagnosis. Most (70.8%) of the children met criteria for more than one disorder. The mean number of diagnoses of children in the study was 2.1 disorders.

Parent and family characteristics. The primary caretaker of the child included biological mothers (85.1%), step-, foster, or adoptive mothers (9.6%), or other female relative or guardian (5.4%). They ranged in age from 25 to 39 years ($M = 35.1$). Fifty-nine (60.8%) of the children came from two-parent families; 38 (39.2%) came from single-parent families. Head of household social class (Hollingshead and Redlich, 1958) yielded the following breakdown from lower to higher socioeconomic class: Class V (21.1%), IV (42.2%), III (23.3%), II (10.0%), and I (3.3%). Estimated monthly income for families ranged from \$0–\$500 to more than \$2,500 (median range = \$1,000 to 1,500); 19.8% of the families received social assistance.

Assessment

The central goals of treatment were to reduce antisocial behavior and to improve the child's functioning at home, at school, and in the community, to reduce parental stress and dysfunction, and to improve

family functioning. Measures that reflected the domains of interest were administered immediately before and after treatment and at a 1-year follow-up.

Measures of child dysfunction and prosocial competence. Several measures provided broad indexes of child dysfunction and prosocial behavior. Parents completed the CBCL, which includes 118 items, each rated on a 0- to 2-point scale, that constitute multiple behavior problem scales derived separately for boys and girls in different age groups. The broad-band and summary scales were used because they are applicable to boys and girls of each age group. The Internalizing and Externalizing scales reflect inward-directed (e.g., anxiety or depression) and outward-directed (e.g., aggression or delinquency) problems, respectively. The Total Behavior Problem score includes all items, some of which do not load on specific scales, and reflects overall severity of dysfunction. The CBCL also includes three social competence scales: Participation (child participation in activities), Social (child interactions with others), and School (child's academic performance). These scales yield a Total Social Competence score, which was used to evaluate prosocial functioning.

To evaluate performance at school, the children's teachers completed the Child Behavior Checklist-Teacher Report Form (CBCL-TRF; Achenbach & Edelbrock, 1986). The measure parallels the structure of the parent version of the scale in yielding sex- and age-specific factors and scores for deviance and prosocial functioning. Internalizing, Externalizing, and Total Behavior Problem scales were used to evaluate child dysfunction at school. Several prosocial or positive attribute subscales (performing well in school, working hard, behaving appropriately, learning, and feeling happy) form a composite *total* Adaptive Functioning score that was also examined. Reliability and validity studies of parent and teacher CBCLs have been reported in initial studies on the development of the scales.¹

To assess adaptive and competence-related behaviors further, teachers also completed the Health Resources Inventory (HRI; Gesten, 1976). Each of 54 items is rated on a 5-point scale (1 = *describes the child not at all*, 5 = *describes the child very well*). Several factors (good student, adaptive assertiveness, peer sociability, following rules at school, and frustration tolerance) are included. For present purposes, Following Rules (in class, accepting imposed limits) and Frustration Tolerance (coping with criticism, failure, and pressure) were of interest because they reflect characteristically deficient areas among antisocial children and also serve as an area of focus within treatment. The Total Competence score (sum of all scales) was used to provide an overall index of positive, prosocial functioning. Psychometric evaluation has demonstrated stability of performance (over 4-6 weeks) and alternative types of validity (e.g., convergent and criterion group, with clinic and nonreferred samples). Also, HRI scores are not merely explained by the absence of psychopathology (see Gesten, 1976).

Measures of aggressive, antisocial, and delinquent behaviors. Several measures were included to sample a broad range of aggressive, antisocial, and delinquent behaviors, the primary basis for clinical referral. Parents completed the Interview for Antisocial Behavior (IAB), a semistructured interview that measures diverse overt (e.g., fighting or tantrums) and covert (e.g., stealing or fire setting) antisocial child behaviors (Kazdin & Esveltd-Dawson, 1986). Each of the 30 items is rated on a 5-point scale for severity of dysfunction (1 = *not a problem at all*, 5 = *very much a problem*) and a 3-point scale for duration (1 = *recent or new problem* [≤ 6 months], 3 = *always*). An overall Total Antisocial Behavior score is obtained by summing severity and duration. To provide a more discrete measure of problematic behaviors, the Number of Antisocial Symptoms was derived by tallying those items rated as a 4 (*quite a bit*) or 5 (*very much a problem*) for severity.

Children completed the Children's Action Tendency Scale (CATS; Deluty, 1979), which focuses directly on aggressive behavior. The CATS includes 30 items in which children are asked what they would

do in a variety of interpersonal conflict situations. Response alternatives reflect aggressive, assertive, and submissive responses. Because of the forced-choice format, the scores of the three scales are interdependent. For present purposes, the Aggression scale was selected as the most pertinent, because of its focus on hostile acts as the means of handling conflict with others. The measure has shown adequate internal consistency and test-retest reliability, discriminates between aggressive and nonaggressive children, and reflects change after treatment among antisocial children.

Children also completed the Self-Report Delinquency Checklist (SRD; Elliott, Dunford, & Huizinga, 1987), which assesses delinquent behaviors. The child was interviewed directly and asked questions about the occurrence of delinquent acts at home, at school, and in the community. The items include theft, property damage, illegal services (e.g., peddling drugs), public disorder (e.g., making obscene phone calls), status offenses (e.g., running away), and index offenses (e.g., assault). Select items were excluded (e.g., using checks illegally or threatening others to obtain sex), because they reflect behaviors with extremely low base rates in the age range of the present sample. The measure included 37 items rated on a 4-point scale with numerical anchors for frequency of occurrence (e.g., 1 = *once*, 4 = *five or more times in the previous year*). The Total Delinquency score reflects severity of delinquent behavior. Validity of the scale as a measure of delinquency has been supported in concurrent and longitudinal studies in the report cited above.

Direct observations in the home were not feasible given the large catchment area from which patients were referred. To sample problem behaviors in the home and to supplement more general parent ratings, observations were obtained through the Parent Daily Report (PDR; Chamberlain & Reid, 1987), which requires calling the parents daily. At that time, a list of 23 specific behaviors was reviewed individually with the parent, who noted whether the behavior occurred during the previous 24 hr. Before treatment began, parents were interviewed at the clinic to identify the antisocial child behaviors that occurred (Total Problem Behaviors) and the subset that they viewed as especially problematic for their child (Target Behaviors) among those included in the PDR. At the end of treatment, the phone call procedure was explained and an assessment schedule was agreed on. At each assessment period (posttreatment and 1-year follow-up), 10 calls within a 2- to 3-week period were scheduled to assess the daily occurrence of each behavior on the PDR list. The PDR was mailed to those families without telephones and completed for the 10 observation days. The number of calls or observation days per assessment ranged from 6 to 10 ($M = 9.6$). The measure yielded two scores: daily mean number of problem behaviors and daily mean number of target behaviors each day (i.e., per call). The PDR shows adequate internal consistency, test-retest reliability, intercaller agreement, and moderate correlations (e.g., .4-.6) with overt behaviors in the home (see Foster & Robin, 1988).

Measures of parent and family functioning. We expected treatments, particularly PSST + PMT, to have an impact on maternal perceptions of stress, depression and other symptoms of psychopathology, and family relations. Mothers completed the Parenting Stress Index (PSI; Lloyd & Abidin, 1985), a 120-item scale that assesses sources of stress to the parent. Each item is rated on a 5-point scale to reflect the extent to which particular characteristics are true of them. The Child Domain (47 items) includes 6 subscales (Adaptability, Acceptability,

¹ Teacher-completed measures were administered at pretreatment, posttreatment, and follow-up. If a pretest assessment occasion occurred in summer, the child's teacher in the previous term was contacted for the assessment. In cases where posttreatment and follow-up assessment occurred in summer, the measures were sent after the child began school and was in school for at least 1 month. In this way, teacher assessments were based on at least 1 month of classroom observation.

Demandingness, Mood, Distractibility/Hyperactivity, and Reinforces Parent) that reflect areas in which the child may be perceived as stressful. The Parent Domain (54 items) relates to the parent's views of their own functioning and includes 7 subscales (Depression, Attachment, Restrictions of Role, Sense of Competence, Social Isolation, Relationship With Spouse, and Physical Health). The PSI Total Stress score combines child and parent domains. In addition, the measure includes a separate Life Stress scale consisting of 19 items that measure life events (e.g., change in job or death of a relative) in the environment. We expected the perception of stress (Child Domain, Parent Domain, Total Stress) associated with interpersonal interaction at home to be significantly reduced by the combined treatment condition. Life Events, or "objective" events that occur, were not expected to change or to be influenced differentially by treatments. Reliability (e.g., internal consistency, test-retest reliability over 3 months, and validity (e.g., convergent and criterion group) have supported the construct validity of the scale (e.g., Lloyd & Abidin, 1985).

Mothers completed the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), which reflects severity of depressive symptoms. For each of 21 items, the respondent selects 1 of 3 statements that differ as to the presence or severity of the symptom. The psychometric properties of the BDI have been studied extensively. To sample a broader range of symptoms, mothers also completed the Hopkins Symptom Checklist (SCL-90; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The scale includes 90 items, rated on a 5-point scale, that reflect the degree of discomfort that the symptom has caused in the previous week. Several symptom areas (e.g., somatization, depression, and anxiety) are included. The total score was used to as an overall index of psychiatric dysfunction of the parent. SCL-90 scores correlate highly with clinical ratings and other measures of dysfunction (e.g., MMPI) and differentiate patient and nonpatient groups.

The Family Environment Scale (FES; Moos, Insel, & Humphrey, 1974) is designed to assess interpersonal relationships and the basic organizational structure of the family. Ten scales load on three broad dimensions: Relationship (cohesion, expressiveness, and conflict), Personal Growth (independence, achievement orientation, intellectual-cultural orientation, active-recreational orientation, and moral-religious orientation), and System Maintenance (organization and control). We expected improved relationship and system maintenance dimensions to reflect changes in family functioning. Psychometric evaluation has found moderate to high internal consistency, test-retest stability (up to 1 year), and convergence of selected scales with observed dysfunction in the home (see Foster & Robin, 1988).

Child, parent, and therapist evaluations of treatment. Children, parents, and therapists completed measures to evaluate therapy when treatment had been completed. Children who received PSST completed the Child Evaluation Inventory (CEI), a measure designed to solicit their views about the procedures and the progress they made.² The measure includes 19 items, each rated by the child on a 5-point scale. The first of two subscales (8 items) was designed to measure Treatment Acceptability (e.g., how much the child enjoyed treatment and looked forward to coming to the sessions). We were interested in acceptability to ensure that children (and parents) evaluated the interventions positively. The second scale (11 items) asked the child to evaluate his or her Progress in Treatment (e.g., how much the child learned about getting along with others and about handling problems). Parents completed the Parent Evaluation Inventory (PEI), which was designed to solicit parent evaluations of treatment. This measure is parallel in item content, subscales, and scoring to the CEI, as described previously. Parents completed separate versions to rate their children who received PSST (for PSST and PSST + PMT conditions) and to rate their own treatment (for PMT and PSST + PMT conditions).

Finally, therapists completed the Therapist Evaluation Inventory (TEI) to evaluate children and parents. Separate versions were com-

pleted so that a TEI was completed to evaluate children who received PSST and to evaluate parents who received PMT. The TEI includes the Progress scale, as described previously for the CEI and PEI. A second scale of the TEI measures the therapist evaluation of improvement (e.g., application of skills in everyday life and likely maintenance of changes). The CEI, PEI, and TEI permit evaluation of treatment along the same dimension (progress) from different perspectives. The CEI and PEI (but not the TEI) have been evaluated previously and shown to relate to improvement in other contexts (Kazdin, Bass, Siegel, & Thomas, 1989).

Treatment Conditions

Families who met the screening criteria and completed pretreatment assessments were randomly assigned to conditions and therapists. Treatment was provided individually to each family. The child and/or parent(s) were seen, according to 1 of 3 conditions: PSST, PMT, or PSST + PMT. Each condition lasted between 6 and 8 months ($M = 7.1$, $SD = 1.9$), with no differences in duration among conditions.

Problem-solving skills training. Children assigned to PSST ($n = 29$) received 25 individually administered sessions. Sessions lasted approximately 50 min and were administered once per week. The treatment was originally derived from procedures developed by Spivack, Platt, and Shure (1976) and Kendall and Braswell (1985). Modifications and extensions were made to focus on antisocial children, to emphasize interpersonal situations in everyday life, to include opportunities to individualize the content to address referral concerns and situations in which the child had evinced dysfunction, and to extend training to the home (see Kazdin et al., 1989). The treatment combines cognitive and behavioral techniques to teach problem-solving skills (e.g., generating alternative solutions and engaging in means-ends thinking) to manage interpersonal situations (e.g., with parents, teachers, siblings, and peers; at home, at school, and in community). Within the sessions, practice, modeling, role playing, corrective feedback, and social and token reinforcement were used to develop problem-solving skills. Outside of the sessions, the child was assigned tasks, referred to as *supersolvers*, to apply the steps to increasingly difficult interpersonal situations in everyday life.

Parents were actively involved in the child's treatment. Parents were brought into the sessions to watch, to assist the therapist, and to foster use of the problem-solving steps in the home. The parent received written guidelines regarding how to prompt and to assist the child, observed the therapist and child role play the procedure, received feedback and social reinforcement from the therapist as needed to develop parental skills in prompting and reinforcing the child's use of the steps, and assisted the child in the completion of supersolvers outside of the sessions. Interviews with parent and child, reenactment of the previous week's supersolvers within the treatment session, between-session phone contacts, point incentives at the clinic for supersolver completion, and review of performance during weekly case supervision were used to foster and to monitor completion of the supersolvers.

Parent management training. In the PMT group ($n = 31$), the parent or guardian of each child was seen individually for 16 treatment sessions spread over approximately 6 to 8 months. Each session lasted approximately 1.5 to 2 hr. The sessions were initially conducted weekly but were faded to every other week for the final 3 to 4 sessions. The fading was designed to increase the independence of the parent in

² Copies of the Child, Parent, and Therapist Evaluation Inventories and further descriptions of treatment are available from Alan E. Kazdin.

carrying out and monitoring programs in the home and, for PSST + PMT, to coordinate the completion of treatment at a similar point in time.

The treatment program originally drew on procedures described by Patterson, Reid, Jones, and Conger (1975) and Fleishman and Conger (1978). Changes in content and delivery evolved over the course of our work (Kazdin, Esveldt-Dawson, French, & Unis, 1987a). Sessions covered several content areas and included observing and defining behavior, variations of positive reinforcement, shaping, negotiating and contracting, and providing time out, reprimands, and special contingencies for low-rate behavior. Didactic instruction, modeling, and role play were used to develop specific skills of the parents and to convey techniques to be used at home. After initial programs were in operation for several weeks at home, the child's school was contacted. The therapist, teachers, and parent developed a reinforcement program to address child deportment and academic performance. The program was devised so that the child's performance at school was monitored and evaluated by the teacher but back-up reinforcers (privileges, activities, and small prizes) were earned at home. At different points in treatment the child was brought into the sessions to review the program and to negotiate the reinforcement contingencies. These sessions were included to involve the child in PMT, to monitor the parents' execution and adherence to the program, and to supervise and shape parent-child negotiations of home- and school-based reinforcement contingencies.

PSST and PMT combined. Families assigned to this condition ($n = 37$) received the full regimen of both PSST and PMT, each as described above, over the same time period (6–8 months). Separate therapists provided treatment to the child and to the parents so that the sessions could be conducted concurrently when families came to the clinic.

Treatment Administration

Common features among treatments. Several features of clinical care, individualization of treatment, and case management deserve comment. First, between treatment sessions, the parents were called (1–2 times) to address problems and emergent issues, to refine programs as needed, and to praise the parents for carrying out specific actions discussed in the treatment sessions. Second, parents and children were involved in each treatment condition. For PSST, parents participated with their child at the end of selected treatment sessions to learn their child's problem-solving steps and to help prompt the child's use of the skills. For PMT, the child was involved in selected PMT sessions to review behavioral programs at home and at school and to negotiate contingency contracts. Third, treatments were guided by manuals that specified the content and focus of each session. At the same time, the treatments were individualized to incorporate specific referral problems of the child and to consider parent and child routines, sibling and peer relations, and other home and school circumstances.

Therapists. Seven clinicians (5 women and 2 men; ages 24–56 years, median = 26) served as therapists and were assigned cases in each condition. Each therapist had a master's degree in social work, clinical psychology, or another mental health-related field, and had direct experience with children and families in the clinic prior to the study. The therapists participated in a training program for 6 to 12 months to

learn each treatment. Training involved extensive role playing and modeling to master the treatment, at which point training cases of antisocial children were assigned. Initial training cases of children were closely supervised using direct observation of the sessions, review of tapes with individual therapists on a session-by-session basis, and discussion of the case. Throughout the study, treatment sessions were videotaped for supervision and review purposes.

Treatment integrity. To sustain the integrity of treatment, (a) therapists followed a treatment manual that delineated each session; (b) each therapist saw training cases in each condition; (c) materials were provided to foster correct execution, including checklists that prescribed the necessary materials for each session, the specific themes or tasks, and in-session notes and outlines; (d) documentation of the session summarized what transpired and how the child or parent progressed; and (e) ongoing clinical supervision, direct and unannounced observation (through a one-way mirror) of treatment sessions, weekly review of cases and videotaped sessions, and feedback to therapists were provided throughout the investigation.

Results

Attrition

Ninety-seven children met inclusion criteria, completed pre-treatment assessments, and began treatment. Of these, 76 (78.4%) completed treatment. Of the 21 subjects who terminated early from treatment, 4 were from PSST, 9 from PMT, and 8 from PSST + PMT. (One PMT case that completed treatment was lost for data analytic purposes. For this child, consent for posttreatment and follow-up assessment was revoked as part of a custody dispute.) At posttreatment and at 1-year follow-up, respectively, data were available from the parents, teachers, or both for 75 (77.3%) and 70 (72.2%) of the cases that began treatment.

The proportions of cases that dropped out of PSST, PMT, and PSST + PMT of those assigned to each condition were 13.8%, 29.0%, and 21.6%, respectively. These proportions were not significantly different for the three conditions. In clinical lore, the general view is that PMT makes special demands on parents, when compared with a child-focused treatment, and is likely to lead to greater attrition. In fact, the proportion of cases lost for the two conditions with PMT (PMT only and PSST + PMT) was higher than for PSST-only cases (25.0% vs. 13.8%). A chi-square test of these proportions did not approach statistical significance ($\chi^2 < 1$).

Children and families who dropped out treatment were compared with those who remained. To identify any differences, multiple t tests for continuous variables (e.g., child age) and chi square tests for categorical variables (e.g., sex and race) were conducted across subject and demographic variables and all pretest measures. These tests did not correct for familywise error rate for the number of tests, in an effort to identify potential differences between groups. Across a large number of tests, one difference emerged. Children who dropped out of the study were lower in estimated full-scale WISC-R IQ ($M_s = 91.8$ vs. 99.8), $t(92) = 2.02$, $p < .05$. On other measures, those who dropped out were no different from those who completed treatment.

Table 1
Means and Standard Deviations for Child and Parent Measures

Measure	Pretreatment		Posttreatment		1-year follow-up	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Problem-solving skills training						
Child Behavior Checklist (Parent)						
Total Behavior Problem	72.0	8.4	64.6	8.5	63.9	9.8
Total Social Competence	34.5	7.5	37.2	9.4	39.4	10.2
Child Behavior Checklist (Teacher)						
Total Behavior Problem	68.7	7.3	62.0	9.1	60.6	9.2
Total Adaptive Functioning	36.4	7.8	39.7	8.6	39.8	7.8
Health Resources Inventory						
Following Rules	16.3	5.6	20.1	6.5	19.7	5.1
Frustration Tolerance	15.1	5.0	20.0	7.2	20.7	5.0
Total Competence	90.1	26.0	109.2	27.6	108.8	17.4
Interview for Antisocial Behavior						
Total Antisocial Behavior	104.1	29.8	89.8	28.4	85.8	26.9
No. of Antisocial Symptoms	9.8	4.7	5.5	5.5	4.5	4.9
Children's Action Tendency—						
Aggression scale	6.6	3.2	3.9	3.3	4.6	2.7
Self-Report Delinquency Checklist—						
Total Delinquency	10.8	8.8	6.0	6.0	7.8	7.9
Parent Daily Report—						
Total Problem Behavior	10.3	4.4	4.6	3.2	3.1	2.9
Parenting Stress Index						
Total Stress	252.6	51.2	245.4	50.3	248.6	50.8
Life Events	3.4	2.1	3.4	2.3	2.3	1.6
Beck Depression Inventory	8.2	7.8	6.8	6.3	6.2	6.6
Symptom Checklist-90	47.2	37.3	42.7	30.9	45.0	36.2
Family Environment Scale						
Relationship	8.7	4.7	9.2	4.0	9.1	4.1
Personal Growth	27.5	5.3	29.6	4.8	30.3	5.6
System Maintenance	-0.2	2.4	-0.2	2.2	0.3	2.9
Parent management training						
Child Behavior Checklist (Parent)						
Total Behavior Problem	69.8	7.5	64.2	9.9	66.1	8.8
Total Social Competence	32.7	9.4	38.7	11.5	39.8	9.6
Child Behavior Checklist (Teacher)						
Total Behavior Problem	66.5	7.0	63.0	7.8	60.7	8.2
Total Adaptive Functioning	35.2	8.1	40.5	7.6	41.6	10.4
Health Resources Inventory						
Following Rules	16.0	6.6	17.7	6.2	16.8	6.5
Frustration Tolerance	17.0	6.7	20.3	6.9	17.9	6.4
Total Competence	96.1	28.8	107.5	26.5	100.6	26.6
Interview for Antisocial Behavior						
Total Antisocial Behavior	104.4	29.4	93.4	30.1	94.4	33.4
No. of Antisocial Symptoms	10.2	5.9	6.4	5.7	7.4	7.3
Children's Action Tendency—						
Aggression scale	5.6	4.0	5.5	4.1	5.9	5.1
Self-Report Delinquency Checklist—						
Total Delinquency	11.0	9.6	10.8	11.3	10.4	5.1
Parent Daily Report—						
Total Problem Behavior	10.2	4.3	6.3	4.1	5.6	3.4
Parenting Stress Index						
Total Stress	263.8	53.1	252.6	55.2	263.7	55.0
Life Events	2.3	1.3	2.0	1.3	1.7	1.7
Beck Depression Inventory	6.3	6.4	6.3	5.5	7.8	6.0
Symptom Checklist-90	48.0	45.3	42.9	39.5	50.7	40.8
Family Environment Scale						
Relationship	6.0	5.6	7.4	5.3	7.3	5.7
Personal Growth	27.6	7.2	26.9	6.7	29.7	5.9
System Maintenance	0.2	2.0	0.4	2.1	0.2	2.3

Table 1 (continued)

Measure	Pretreatment		Posttreatment		1-year follow-up	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Problem-solving skills and parent management training combined						
Child Behavior Checklist (Parent)						
Total Behavior Problem	69.6	7.5	60.2	10.7	56.2	10.3
Total Social Competence	36.7	6.9	44.1	9.8	43.5	7.8
Child Behavior Checklist (Teacher)						
Total Behavior Problem	69.0	7.1	60.5	7.6	60.1	8.8
Total Adaptive Functioning	35.5	7.7	40.1	9.9	39.0	10.4
Health Resources Inventory						
Following Rules	14.1	4.0	17.9	4.6	19.2	4.8
Frustration Tolerance	16.8	6.2	19.9	6.8	20.8	6.7
Total Competence	90.9	22.0	104.6	24.9	112.8	25.6
Interview for Antisocial Behavior						
Total Antisocial Behavior	99.2	20.9	74.1	26.2	67.7	23.5
No. of Antisocial Symptoms	9.3	4.9	3.0	4.2	2.3	3.8
Children's Action Tendency						
Aggression scale	5.6	3.1	3.5	2.1	3.5	2.9
Self-Report Delinquency Checklist—						
Total Delinquency	10.0	6.6	4.1	4.1	4.4	4.1
Parent Daily Report—						
Total Problem Behavior	10.2	3.3	2.0	1.6	2.7	2.2
Parenting Stress Index						
Total Stress	264.0	45.1	230.6	39.4	219.4	44.2
Life Events	2.3	1.8	2.9	1.9	2.6	2.0
Beck Depression Inventory	7.0	6.5	3.3	4.0	4.0	4.9
Symptom Checklist-90	45.7	36.8	26.6	22.2	27.4	27.9
Family Environment Scale						
Relationship	9.4	4.7	10.9	3.8	11.0	5.2
Personal Growth	29.0	6.9	30.7	6.1	31.2	5.8
System Maintenance	0.5	2.4	1.8	1.6	1.9	2.3

Data Reduction and Analyses

The assessment battery included several measures, many with subscales in addition to total scores. To summarize the outcome data and to reduce redundancy in the analyses, correlations were computed for subscales for a given measure (e.g., Internalizing, Externalizing, Total Behavior Problem, and Social Competence of the CBCL). If subscales within a given measure correlated highly ($r \geq .85$ and hence $\geq 72\%$ shared variance) with the total score, the total score and not the subscale was included in the data analyses.

Internalizing and Externalizing scales of the parent CBCL correlated highly with Total Behavior Problem scale scores. Hence, only the total score is presented to summarize overall symptoms. In a parallel fashion, for the teacher CBCL, the Total Behavior Problem score was used to summarize overall child deviance. The two PDR scores, Daily Total Problem Behaviors and Target Behaviors, were highly correlated by the above criterion. Hence, the more inclusive measure (mean Daily Total Problem Behaviors) was used to reflect conduct problem behaviors at home. For the PSI, subscale scores from the child and parent domains correlated highly with the total stress score. Hence, only the total PSI score was used to represent parental stress. For all measures for which more than one outcome scale or score was retained (e.g., IAB, HRI, and FES), the scores within the scale were retained because they did not

correlate highly with each other or with total scores, by the criterion described above.³

Preliminary Analyses

Analyses examined whether participants in the three treatment conditions differed at pretreatment on subject and demographic characteristics as well as on measures of child and parent functioning. Analyses of variance (ANOVAs) for continuous variables and chi-square tests for categorical variables revealed no differences among groups. Similar analyses yielded no reliable differences as a function of therapist or Therapist \times Treatment condition ($ps > .20$) on pretreatment, posttreatment, or follow-up measures. Hence, therapist was not included as a factor in the evaluation of treatment.

³ Multiple outcome measures within a given scale were reduced in number, as noted previously. In principle, the number of different measures (e.g., BDI and SCL-90) might be reduced by the same criterion to avoid redundancy in the analyses. However, on a priori grounds, we were interested in the integrity of each measure as an outcome. Moreover, the correlations at pretreatment and at posttreatment indicated that different measures (within and between child and parent domains) did not meet the criterion ($r \geq .85$) we invoked to reduce the number of subscales within a measure.

Treatment Outcome

We expected that each treatment would reduce child symptoms and improve prosocial functioning and that the combined treatment would show more marked and consistent changes across child, parent, and family measures. To examine changes over time, within-group *t* tests were computed separately for each group. To examine group differences, analyses of covariance (ANCOVAs) were used to obtain the posttreatment and follow-up means. Newman-Keuls comparisons ($p < .05$) were used to control familywise error rates to test the primary prediction, namely, that the combined treatment was different from that of each of the other two treatments.

Posttreatment. The means and standard deviations for each of the treatment groups for child and parent measures appear in Table 1. Within-group *t* tests (Table 2), to evaluate change from pre- to posttreatment, indicated that each group improved over the course of treatment on overall measures of child deviance and prosocial functioning and on measures of aggressive, antisocial, and delinquent behavior. On measures of parent stress, depression and other symptoms, and family functioning, PSST and PMT groups showed only a few changes. In contrast, the PSST + PMT group improved on several parent and family measures.

The expectation that the combined treatment would lead to greater changes was suggested by the magnitude of within-group tests but was more directly examined by between-group comparisons. The ANCOVAs (Table 3), using pretreatment scores as the covariate, indicated that groups did not differ on broad rating scales and measures of prosocial functioning (CBCLs and the HRI). Differences at posttreatment were evident for measures of antisocial and delinquent behavior involving parent- and child-report measures (IAB, CATS, and SRD) and parent observations of behavior at home (PDR). Differences were also evident for parent stress (PSI), depression (BDI), symptoms of psychopathology (SCL-90), and family functioning (FES). (As noted earlier, the Life Events scale of the PSI is a measure objective stressful events and was not expected to reflect group differences and treatment effects.)

To evaluate the source of group differences for significant effects, Newman-Keuls tests were performed to control familywise error rates for an alpha of .05 (Table 4). The PSST + PMT group showed significantly less antisocial and conduct problem behaviors (IAB and PDR) than the PSST or PMT groups. The PSST + PMT group was also significantly lower than the other two groups on measures of parental stress (PSI), depression (BDI), overall symptoms of psychopathology (SCL-90), and family system maintenance (FES). On the child-report measures of aggression (CATS) and delinquent behaviors (SRD), both the PSST and the PSST + PMT group were superior to the PMT group. PSST and PMT were no different from each other on several measures. The differences that did emerge for aggression (CATS), delinquent behaviors (SRD), and conduct problem behaviors at home (PDR) favored PSST.

Follow-up. One year after posttreatment assessment, the assessment battery was readministered to children, parents, and teachers. Our previous work has shown that changes achieved in treatment at posttreatment are generally maintained at follow-up, at least up to 1 year (Kazdin et al., 1987a, 1987b, 1989).

Consequently, we expected that the impact of treatment would continue to be evident at follow-up and that at follow-up, PSST + PMT would continue to show more marked and broader changes across measures. Within-group *t* tests (Table 2) indicated that each group had improved on parent and teacher rating scales (CBCLs and the HRI) from pretreatment to follow-up. For measures of aggressive, antisocial, and delinquent behavior, PSST and PSST + PMT showed significant improvements across several measures; PMT showed fewer changes on these measures. PSST and, to a much greater extent, PSST + PMT improved on parent and family functioning from pretreatment to follow-up. In general, each of the treatments improved from pretreatment to follow-up.

Not presented in Table 2 are the changes that were made between posttreatment and the 1-year follow-up. For the PSST + PMT group, further reductions were evident in deviant child behavior (parent CBCL) and for parent stress (PSI; $t(22) = 2.45$ and 2.52 , respectively, $ps < .05$). For the PSST group, child antisocial behavior at home, as measured by the PDR, continued to improve after treatment, $t(23) = 3.23$, $p < .01$. Only PMT showed no further improvements from posttreatment to follow-up. The few statistically significant improvements in the year after treatment for any of the groups must be seen against the larger backdrop of no change on virtually all of the measures. The results suggest that the gains achieved by posttreatment were maintained, at least up to 1 year. An unexpected exception pertains to the PMT group. For some measures, pre- to posttreatment had reflected improvement but pretreatment to follow-up changes did not (CBCL Total Problem, HRI, and IAB; see Table 2). These results suggest that some of the gains made in treatment for the PMT-only group attenuated by follow-up.

On the basis of the number of measures that changed and the magnitude of the changes, the follow-up results suggest that the PSST + PMT group showed the greatest improvements. To test the between-groups differences directly, ANCOVAs were completed (Table 3), using pretest performance as the covariate. The analyses showed significant group differences for parent CBCL ratings of total behavior problems and teacher CBCL ratings of the children's ability to follow rules, level of frustration tolerance, overall social competence (HRI), aggressive, antisocial, and delinquent behavior (IAB, CATS, and SRD), and home observations of conduct problems (PDR). Parental stress, depression, and overall symptoms of dysfunction also were different among the three treatments. The measures of family functioning (FES) no longer yielded significant differences at follow-up.

Newman-Keuls tests were computed on the adjusted means from the ANCOVAs at the 1-year follow-up for those effects that attained significance (Table 4). The PSST + PMT group showed lower Total Behavior Problem scores (parent CBCL) and less antisocial and delinquent behavior on parent- and child-completed measures (IAB and SRD) relative to the PSST or PMT groups. On measures of parent and family functioning, PSST + PMT was significantly lower in reported stress (PSI) and parent symptoms (SCL-90), relative to the other groups. PSST and PSST + PMT groups were better than the PMT-only group but were no different from each other on a number of measures, including following rules, frustration tolerance, and

Table 2
Within-Group t Tests From Pre- to Posttreatment and Pretreatment to 1-Year Follow-up

Measure	Pre- to posttreatment			Pretreatment to follow-up		
	PSST (<i>df</i> = 24)	PMT (<i>df</i> = 20)	PSST + PMT (<i>df</i> = 28)	PSST (<i>df</i> = 23)	PMT (<i>df</i> = 18)	PSST + PMT (<i>df</i> = 27)
Child Behavior Checklist (Parent)						
Total Behavior Problem	5.86***	3.20**	7.81***	5.16***	1.18	6.40***
Total Social Competence	2.30*	2.90**	4.92***	2.81**	3.03**	4.79***
Child Behavior Checklist (Teacher)						
Total Behavior Problem	4.20***	1.70	5.43***	4.79***	3.65**	5.39***
Total Adaptive Functioning	2.65**	3.75***	3.37**	1.64	3.37**	2.21*
Health Resources Inventory						
Following Rules	3.58**	2.52*	6.03***	3.44**	<1	5.25***
Frustration Tolerance	4.15***	2.74**	3.26**	6.21***	<1	3.38**
Total Competence	2.63*	3.04**	5.02***	3.63***	<1	4.74***
Interview for Antisocial Behavior						
Total Antisocial Behavior	3.57**	2.05*	9.03***	4.85***	<1	6.18***
No. of Antisocial Symptoms	6.54***	3.74***	8.13***	7.14***	1.29	7.21***
Children's Action Tendency—						
Aggression scale	4.70***	<1	4.36***	4.05***	<1	3.32**
Self-Report Delinquency Checklist—						
Total Delinquency	3.51**	<1	8.31***	2.01	<1	5.61***
Parent Daily Report—						
Total Problem Behavior	7.54***	3.88***	13.74***	7.31***	2.43*	9.93***
Parenting Stress Index						
Total Stress	1.10	2.26*	4.24***	1.21	<1	4.48***
Life Events	<1	1.16	1.50	2.32*	1.33	<1
Beck Depression Inventory	1.62	<1	4.60***	2.11*	-1.18	2.94**
Symptom Checklist-90	<1	<1	5.23***	<1	<1	3.19**
Family Environment Scale						
Relationship	<1	1.04	2.44*	<1	1.01	1.07
Personal Growth	3.27**	<1	2.36*	2.78**	1.65	2.77**
System Maintenance	<1	<1	2.60*	<1	<1	1.87

Note. To aid interpretation, some of the signs of the *t* tests have been changed, so that a positive *t* value indicates improvement (e.g., decrease in symptoms or increase in prosocial functioning). The groups include problem-solving skills training (PSST), parent management training (PMT), and both of these treatments combined (PSST + PMT).

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

overall social competence (HRI), number of antisocial symptoms (IAB), self-reported aggression (CATS), conduct problems at home (PDR), and parent depression (BDI).

Clinical Impact of Treatment

In outcome research with antisocial youth, demonstrating clinically significant change has been more daunting and illusive than demonstrating statistically significant improvements. Although there is no standardized way to assess clinical significance, one means is to evaluate the extent to which treatments bring child behavior within the nonclinical range of functioning (Kazdin, 1992). Normative data are available for the CBCLs to permit delineation of a range of behavior for nonreferred (community) samples. We evaluated the present improvements to examine the extent to which the treatments produced clinically important changes, as reflected on the CBCL scales.

Mean level of deviance. The primary goal of treatment was to reduce behavioral problems and overall child dysfunction. To reflect an overall level of dysfunction, total behavior problem (CBCL and CBCL-TRF) scales were examined for children who participated in the study, relative to nonreferred samples within the same age range. On the basis of their analyses of

clinical and nonreferred samples, Achenbach and Edelbrock (1983, 1986) identified the 90th and 89th percentiles as cutoff scores for the upper limit of the normal range for the Total Behavior Problem scores of parent and teacher CBCLs, respectively. Scores below these percentiles fall within the nonclinical ("normal") range. For present purposes, these percentile criteria were used to define the upper limit of the normal range on Total Behavior Problem scores for parent and teacher versions of the CBCL, respectively.

The initial question of interest was the extent to which changes achieved among children within the alternative groups were within the nonclinical ranges. To address this question, scores that defined the boundary of the normal range were used as criteria to evaluate performance on the behavior problem scales. Figure 1 presents the Total Behavior Problem scores for parent (upper panel) and teacher (lower panel) CBCLs for children in PSST, PMT, and PSST + PMT, as well as the cutoff scores that are based on data obtained from nonclinic samples. The figure shows that children in each group improved on the parent CBCL (upper panel). The means approached, and for the PSST + PMT group entered, the nonclinical range at post-treatment and improved further by follow-up. For Total Behavior Problem scores on the teacher-completed CBCL (lower

Table 3
Analyses of Covariance at Posttreatment and Follow-up

Measure	Posttreatment (<i>df</i> = 2, 71)	1-year follow-up (<i>df</i> = 2, 66)
Child Behavior Checklist (Parent)		
Total Behavior Problem	1.95	6.96**
Total Social Competence	2.71	<1
Child Behavior Checklist (Teacher)		
Total Behavior Problem	1.29	<1
Total Adaptive Functioning	<1	<1
Health Resources Inventory		
Following Rules	1.87	4.72**
Frustration Tolerance	<1	3.16*
Total Competence	<1	3.33*
Interview for Antisocial Behavior		
Total Antisocial Behavior	4.56**	5.28**
No. of Antisocial Symptoms	4.10*	5.86**
Children's Action Tendency—		
Aggression scale	5.34**	3.99*
Self-Report Delinquency Checklist—		
Total Delinquency	11.48***	7.48***
Parent Daily Report—		
Total Problem Behavior	14.28***	4.55*
Parenting Stress Index		
Total Stress	4.43*	10.24***
Life Events	2.14	1.41
Beck Depression Inventory	7.45***	4.66**
Symptom Checklist-90	4.80**	4.72**
Family Environment Scale		
Relationship	1.71	<1
Personal Growth	5.48**	<1
System Maintenance	7.27***	2.86

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

panel), the means for each group were at or within the normative range at posttreatment. At follow-up, each group mean was within the normative range, and the groups were obviously similar in their outcomes on this measure.

Individual cases. To examine the improvement of individual children, we evaluated the proportion of cases that fell within the normative range for the Total Behavior Problem scores for parent and teacher measures (Table 5). Chi-square tests were computed to examine group differences in placing children within the normal range. On the parent CBCL, group differences only approached significance at posttreatment, $\chi^2 = 4.95$, $p < .06$; by follow-up this effect reached statistical significance ($p < .01$). At both assessment points, the proportion of PSST + PMT cases within normal range was higher than the proportion of PSST and PMT cases. On the teacher CBCL, the proportion of cases within the normal range did not differ among the groups.

Functioning within the normal range for parent or teacher ratings of deviant behavior is obviously important. As a more stringent criterion, we examined the proportion of cases in each group that fell within the normal range on both parent and teacher CBCL measures, excluding anyone who received a score on either measure within that range at pretreatment. At posttreatment and at follow-up, significantly more PSST + PMT cases fell within the normal range on both measures when compared with the other two groups (Table 5). Thus, on

the parent measure and the combination of parent and teacher measures, the PSST + PMT group appeared to achieve greater change in the number of individuals whose symptoms were reduced.

Child and Parent Evaluations of Treatment

Children and parents completed the CEI and the PEI, each of which includes two subscales to assess treatment acceptability and progress in therapy. Of initial interest were child and parent evaluations treatment acceptability. With a range of 8–40, a neutral rating of treatment across the eight items would indicate a moderate level of acceptability (a score of 3 for each item). This neutral rating would yield a mean score of 24; higher scores reflect more positive reactions. Children who received PSST (PSST and PSST + PMT conditions) rated the acceptability of treatment favorably ($M_s = 37.1$ and 35.0 , respectively). Parents of these children also rated their child's treatment favorably ($M_s = 33.6$ and 35.1 , respectively). Parents who received PMT (PMT and PSST + PMT) also rated their own treatment positively ($M_s = 36.4$ and 38.1 , respectively). In general, these ratings suggest that treatment was viewed favorably. Statistical comparisons indicated that treatments were not different in ratings of acceptability.

The other CEI and PEI scales included ratings of progress in treatment. Child ratings of progress in treatment did not differ between PSST and PSST + PMT. However, parents rated their children's progress as significantly greater in the PSST + PMT than in the PSST-only condition ($M_s = 46.1$ vs. 38.8), $F(1, 51) = 15.68$, $p < .001$. Parent's who received PMT evaluated their own progress. Parent ratings of progress were higher in the PSST + PMT condition relative to the PMT-only condition ($M_s = 50.4$ vs. 45.1), $F(1, 48) = 7.74$, $p < .01$.

Therapists rated progress within the session as well as improvement as a result of treatment. Therapist evaluations of progress in the sessions and therapeutic improvement scales were highly correlated for therapists' evaluations of children and parents ($r_s = .83$ and $.88$, respectively, $p_s < .001$). However, the separate TEI scales were maintained to permit a comparison of child, parent, and therapist evaluations on the progress scale. Therapists ratings of progress and improvement of children who received PSST (both PSST and PSST + PMT conditions) did not differ by condition. Therapist ratings of parents who received PMT (both PMT and PSST + PMT cases) hinted at greater progress ($p < .10$) and improvement ($p < .15$) for PSST + PMT than for PMT-only parents, but the differences did not attain significance. Correlations of progress ratings among children, parents, and therapists indicated low relations among these perspectives. Child and parent ratings of the child's progress and therapist and parent ratings of the child's progress were not related ($r_s = .22$ and $.21$, respectively, n_s). Child and therapist ratings of the child's progress and parent and therapist ratings of the parent's progress were related ($r_s = .32$ and $.41$, respectively, $p_s < .01$).

Relations Among Changes Across Domains

Child and parent functioning. Prior analyses indicated systematic improvements in child and parent measures of out-

Table 4
Multiple-Comparison Tests at Posttreatment and Follow-up

Measures	Posttreatment			1-year follow-up		
	PSST	PMT	PSST + PMT	PSST	PMT	PSST + PMT
Child Behavior Checklist (Parent)—						
Total Behavior Problem	—	—	—	63.0 _a	66.9 _a	56.5
Health Resources Inventory						
Following Rules	—	—	—	18.9 _a	16.3	20.2 _a
Frustration Tolerance	—	—	—	21.3 _a	17.6	20.5 _a
Total Competence	—	—	—	109.1 _a	98.8	113.6 _a
Interview for Antisocial Behavior						
Total Antisocial Behavior	91.4 _a	94.7 _a	79.6	83.7 _a	93.7 _a	70.3
No. of Antisocial Symptoms	5.5 _a	6.1 _a	3.3	4.3 _a	7.4	2.5 _a
Children's Action Tendency—						
Aggression scale	3.6 _a	5.8	3.7 _a	4.0 _a	6.3	3.9 _a
Self-Report Delinquency Checklist—						
Total Delinquency	5.9 _a	10.5	4.5 _a	7.6	10.9	4.3
Parent Daily Report—						
Total Problem Behavior	4.6	6.2	2.0	3.1 _a	5.6	2.7 _a
Parenting Stress Index—						
Total Stress	250.8 _a	250.0 _a	227.8	252.9 _a	264.4 _a	214.4
Beck Depression Inventory	6.2 _a	6.8 _a	3.5	5.7 _a	8.4	4.0 _a
Symptom Checklist-90	42.5 _a	42.2 _a	27.3	44.4 _a	50.7 _a	28.0
Family Environment Scale						
Personal Growth	30.1 _a	27.1	30.0 _a	—	—	—
System Maintenance	0.0 _a	0.3 _a	1.7	—	—	—

Note. The groups include problem-solving skills training (PSST), parent management training (PMT), and both of these treatments combined (PSST + PMT). For a given measure at posttreatment (or follow-up), means that share the same subscript are not significantly different. All differences are significant at $p < .05$, using Newman-Keuls tests. The means are adjusted on the basis of analyses of covariance using pretreatment scores as the covariate. Dashes signal that multiple comparisons were not made because the overall test was not statistically significant.

come. The findings do not address the matter of the relation of changes between child and parent functioning. To explore these relations, within-group correlations (averaged by Fisher's z' transformation) were computed for changes between measures of child and parent functioning. Among diverse measures, the results showed small and nonsignificant correlations in changes in the child and parents from pre- to posttreatment and posttreatment to follow-up assessment. Illustrative of these data, improvements in Total Behavior Problem scores from pre- to posttreatment were not significantly correlated with changes in parent stress, depression, or overall parent symptoms (PSI, BDI, and SCL-90; $r_s = .02-.23$). Separate analyses by conditions did not yield a reliable pattern showing that changes in child functioning were significantly correlated with changes in parent functioning.

Deviant and prosocial child behavior. The effects of treatment were evaluated as to reductions in deviant behavior as well as to improvements in prosocial functioning both at home and at school. Within a given rater (parent or teacher), measures of symptoms and prosocial functioning were obtained so that the magnitude of the correlations between deviant and prosocial behavior was not attenuated by the comparison of different raters. For the parent CBCL, Total Behavior Problems and Total Social Competence were significantly, and as expected, negatively correlated at pretreatment ($r = -.37, p < .001$). Changes in Total Behavior Problems and Social Competence, computed by within-cell correlations, were significantly correlated from pre-

to posttreatment ($r = -.30, p < .01$) but not from pretreatment to follow-up ($r = -.18, ns$). The negative signs for these correlations indicate that reductions in behavioral problems were generally associated with increases in prosocial behavior. The magnitude of the correlation at pretreatment and the change correlations indicate that there was a reliable but small relation between symptoms and prosocial behavior before treatment and in the extent to which these domains changed.

Similarly, teacher CBCL ratings included Total Behavior Problems and Adaptive Functioning scores. At pretreatment, these measures were significantly and negatively correlated ($r = -.56, p < .001$). Changes in each of these scales from pre- to posttreatment and from pretreatment to follow-up were significantly correlated ($r_s = -.52$ and $-.35$, respectively, $ps < .01$). Deviant and positive behaviors at school were correlated in the moderate range at pretreatment and tended to change together. In general, the results suggest that deviant and prosocial behavior are related but at the same time somewhat separate domains of functioning.

Child functioning at home and at school. The effects of treatment were evaluated by obtaining ratings of child symptoms at home and at school. Total behavior problem scores at home (CBCL) and at school (CBCL-TRF) were not significantly correlated at pretreatment ($r = -.03, ns$). The correlations for changes in behavioral problems at home and at school from pre- to posttreatment and from pretreatment to follow-up were low and not significant ($r_s = .12$ and $.14$, respectively). These

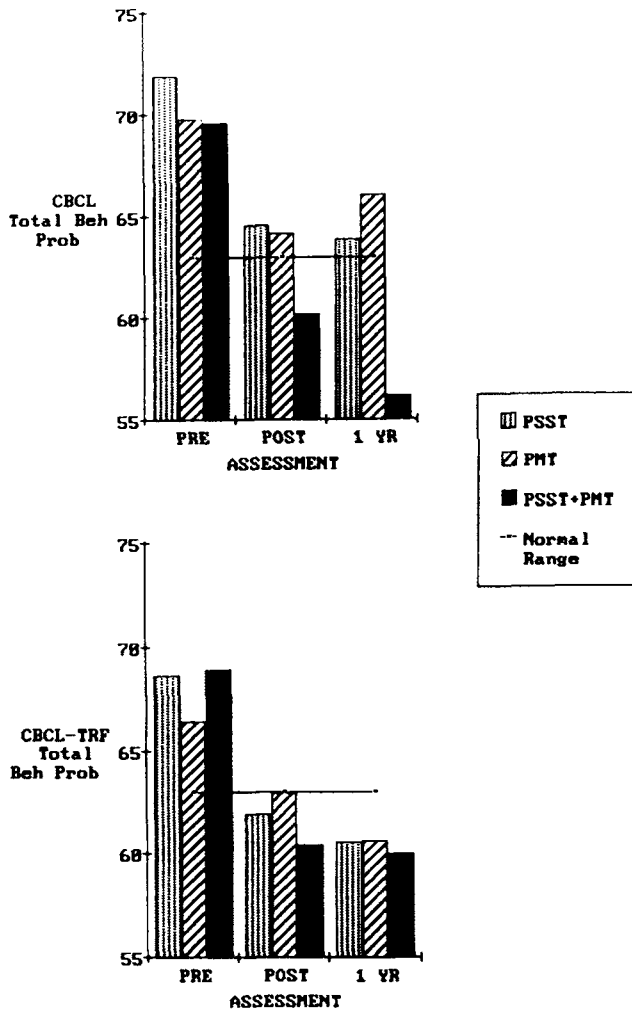


Figure 1. Mean T scores for problem-solving skills training (PSST), parent management training (PMT), and PSST + PMT combined for the Total Behavior Problem scales of the parent-completed Child Behavior Checklist (CBCL, upper panel) and teacher-completed CBCL (lower panel). The horizontal line reflects the upper limit of the non-clinical ("normal") range of children of the same age and sex. The T scores below this line were within the normal range.

data are consistent with our previous work noting that performance at home and at school is often unrelated and that change in these domains shares little variance. The results have implications for treatment evaluation given that quite different patterns might be evident on outcomes that reflect child functioning at home and at school.

Discussion

The major findings were: (a) PSST, PMT, and PSST + PMT were associated with significant improvements in overall child dysfunction, prosocial competence, and aggressive, antisocial, and delinquent behavior; (b) improvements were evident in performance at home, at school, and in the community immediately after treatment and at 1-year follow-up; (c) PSST + PMT

generally had a more marked impact on measures of child aggression, antisocial behavior, and delinquency, and parental stress, depression, and other symptoms of parent dysfunction, relative to PSST and PMT; and (d) PSST + PMT also placed a greater proportion of youth within normative levels of functioning.

Cognitive PSST and PMT, as separate treatments, led to improvements in child functioning. The results are consistent with previous studies of these individual treatments, as noted in reviews cited earlier. In the present study, each treatment was associated with reliable changes in measures completed by different raters (child, parent, and teacher) that reflect performance across multiple response domains (deviant, antisocial, and prosocial behavior) and different settings (home, school, and community). The improvement of each treatment group, given the absence of a no-treatment control condition, might well be due to such influences as history, maturation, repeated testing, and other threats to internal validity. Our previous work at the Child Conduct Clinic using the same recruitment and screening criteria and attention-placebo and alternative comparison groups (relationship therapy) has resulted in little or no change over the course of treatment or follow-up without a specific training regimen (Kazdin et al., 1987a, 1987b, 1989). Nevertheless, previous demonstrations of no change for control and alternative comparison conditions cannot rule out threats to internal validity in the present study.

However, our central goal was to evaluate the differential impact of alternative treatments. Specifically, we expected that the combination of PSST and PMT, in light of their separate treatment outcome literatures, complementary conceptual models, and treatment foci, would generate an intervention more potent than either treatment alone. This expectation was supported. The combined treatment led to more marked changes in antisocial behavior and prosocial behavior of the child and in parental stress and overall symptoms of dysfunction. The effect was also evident in the proportion of children that the combined condition placed within the normative range of functioning. The differences in favor of the combined treatment were evident in several child- and parent-completed measures at posttreatment and follow-up. The teacher-completed measures showed no differences at posttreatment and no differences between PSST and PSST + PMT at follow-up.

We did not make predictions regarding the differential effectiveness of PSST and PMT as separate interventions. In general, both treatments led to change and were similar on outcome measures. Yet, at posttreatment and follow-up, the few statistically significant differences between these two conditions (social competence at school and self-report aggression and delinquency) favored PSST. Also, for PMT only, but not for PSST, a number of child improvements evident at posttreatment were no longer evident at the 1-year follow-up.

A reason to combine PSST and PMT was not only to increase the impact of treatment on the child, but also to provide the parents with more effective means of parenting and interacting with their children at home. The benefits were expected to be reflected in measures of parent stress and dysfunction, critical contextual factors related to the impact and maintenance of treatment gains. The combined treatment led to gains in both child and parent functioning. Interestingly, improvements in

Table 5
Proportion of Children Within the Range of Nonclinic Samples for Total Problem Behaviors at Home and at School at Posttreatment and Follow-up

Measure	PSST		PMT		PSST + PMT		$\chi^2(2)$
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Within normal range at posttreatment							
Parent CBCL	7/21	33.3	7/18	38.9	16/25	64.0	4.95
Teacher CBCL	11/19	57.9	6/14	42.9	16/23	69.6	2.58
Both parent & teacher CBCL	4/15	26.7	2/11	18.2	12/20	60.0	6.82*
Within normal range at 1-year follow-up							
Parent CBCL	7/21	33.3	4/14	28.6	15/21	71.4	8.52**
Teacher CBCL	10/17	58.8	8/14	57.1	15/23	65.2	<1
Both parent & teacher CBCL	2/15	13.3	1/11	9.4	10/20	50.0	8.30*

Note. The groups include problem-solving skills training (PSST), parent management training (PMT), and both of these treatments combined (PSST + PMT). Within the normal range refers to percentiles derived from normative data for separate age and sex groupings for the Total Behavior Problem Scale of the Child Behavior Checklist (CBCL; please see text for criteria). Any case with a pretreatment score within range on a measure was excluded from these proportions.

* $p \leq .05$. ** $p < .01$.

children and parents were not highly correlated. It may well be that child and parent change are not linearly related. A specific threshold may need to be crossed in child improvement to make a difference in parent stress in the home and in how the parents view themselves.

Several limitations of the present study restrict interpretation of the findings. First, the main finding is that the combined treatment produced greater changes on several measures of child and parent functioning. Yet, processes and mechanisms accounting for the changes were not investigated in this study. A more fine-grained analysis of the processes underlying the present findings is essential to identify the factors leading to or predictive of outcome.

Second, the long-term outcome of youth with disruptive behavior disorders is often poor (e.g., Robins, 1981; Weiss & Hechtman, 1986). Our concern with parent stress and dysfunction and parent-child interaction is based in part on previous evidence relating these domains to maintenance of therapeutic changes. Yet, the 1-year follow-up in our study only begins to address the impact of treatment. Longer term follow-up (e.g., 5 years) is needed to assess whether the gains are maintained and, if so, whether treatments vary in their effects.

Third, the combination of PSST and PMT is a reasonable extension of the available literature. Child cognitive processes, parent-child interaction, and parent stress are relevant domains already identified in prior research. At the same time, some domains of dysfunction relevant to antisocial child behavior were not incorporated into treatment. For example, peer relations (bonding) and academic dysfunction, which may play a significant role in maintenance of antisocial behavior (Kazdin, 1987b; Pepler & Rubin, 1991), were addressed only tangentially by our interventions. Whether long-term impact can be achieved without a broader focus remains to be seen. A conceptual and treatment dilemma is how best to treat antisocial

youth to encompass the many domains of dysfunction they and their families often present.

Fourth, there are special difficulties in working clinically with the families of conduct-disordered children. Antisocial children and their families usually have a particularly poor attrition record in research (see Capaldi & Patterson, 1987). In our study, 22% of the cases dropped out of treatment. Attrition in child therapy studies hovers between 45 and 65% (see Pekarik & Stephenson, 1988). Conceivably, our results might only apply to persons who can sustain protracted treatment. Parent training is particularly demanding and hence might be expected to lead to greater attrition than purely child-based therapy. We did not find attrition to be reliably different for PMT versus non-PMT conditions. However, all of our treatments placed demands on the parent and hence may not provide the appropriate test.

Several basic questions remain about how to optimize therapeutic changes among antisocial children and their families. The present study focused on alternative approaches and their combination. A variety of factors beyond the treatment approach are likely to contribute to outcome and warrant examination. In the case of antisocial behavior, subtypes of dysfunction (e.g., Dodge, 1991), family loading of risk factors (Kazdin, 1987b), and alternative paths leading to antisocial behavior (e.g., Patterson et al., 1991) may be useful to help match patients to treatments. The present study represents an effort to develop a treatment package to improve impact and serves as a basis to address other factors that may moderate outcome.

Notwithstanding these and other limitations, the present study was designed to respond to clinical and research issues involving evaluation of treatment with clinically referred antisocial children and families. The central finding is that treatments can effect change in antisocial and prosocial child behavior and that a combined treatment that addresses cognitive pro-

cesses and parent-child interaction may represent a viable intervention. Although our results can only speak to the specific combination we studied, the importance of a broad treatment focus and integration of parent and family issues is highlighted by these findings. The potential benefits of a parent- and family-based focus warrants continued attention given the constellation of dysfunctions that antisocial children and their families often present.

In general, the therapeutic goals for antisocial children are barely in sight. The treatments we have investigated still leave many children outside of the normative range of functioning. Moreover, the present study does not show that treatment controverts the poor long-term prognosis among youth who respond to treatment. Research designed to understand the nature of antisocial children and their families and to draw on this information to bolster treatment effects remains critically important.

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