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Moderators of Treatment Outcome in Cognitively Based Treatment of Antisocial Children[1]

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This study examined cognitive/academic functioning and severity of clinical dysfunction as moderators of treatment outcome of cognitively based treatment among children (N = 120, ages 7 to 13 years) referred for aggressive and antisocial behavior. We predicted that more favorable treatment outcome would be evident among children higher in intellectual functioning, reading achievement, and level of school functioning, and with less severe and chronic symptoms of antisocial behavior and fewer symptoms across a range of diagnoses. The predictions were evaluated in relation to posttreatment behavioral problems and prosocial functioning at home and at school. Reading achievement, academic and school dysfunction, and number of symptoms across all diagnoses predicted treatment outcome. Additional analyses indicated that parent, family, and contextual factors (socioeconomic disadvantage, parent dysfunction, and adverse child-rearing practices) were related to child predictors, as well as to treatment outcome. The results convey the importance of child moderators of cognitive-behavioral treatment, as well as broader parent, family, and contextual influences in which these are embedded.

KEY WORDS: cognitively based treatment; child antisocial behavior; conduct disorder.

Cognitive-behavioral treatments for children and adolescents focus on self-statements, problem-solving skills, perspective taking, and self-regulation

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and monitoring, among other strategies (see Kendall, 1991). Several controlled studies have indicated that treatment is effective, compared to no treatment and various "attention placebo" control conditions, for youths with externalizing problems such as oppositional, impulsive, aggressive, and antisocial behavior (see Baer & Nietzel, 1991; Durlak, Fuhrman, & Lampman, 1991; Dush, Hirt, & Schroeder, 1989). Even so, many children may not respond or may not respond well enough for the change to reflect clinically meaningful outcomes. Identifying those factors that influence (moderate) the effectiveness of treatment would be extremely important, both to enhance understanding of how treatment operates and to direct youths toward treatment from which they are likely to profit.

Older children (e.g., > 10 to 11 years of age) respond better to cognitively based treatment than do younger children, as attested to by meta-analyses of the outcome research (Durlak et al., 1991; Dush et al., 1989). Higher levels of cognitive functioning and abilities (e.g., intellectual functioning, abstract reasoning) have been proposed to explain this difference, although direct empirical tests have yet to be reported. The hypothesis is plausible, given that a broad set of interrelated factors that span neuropsychological, intellectual, and academic/school dysfunction have been implicated in the paths leading to conduct disorder and poor long-term prognosis (see Kazdin, 1995; Moffitt, 1993). In particular, intelligence and related abstract verbal abilities, achievement (particularly reading), and academic and educational delays have been identified as risk factors for onset and poor prognosis of conduct problems. Also, abstract verbal abilities relate to key features of conduct problems such as inhibition of impulsive responding, self-control, and performance of aggressive acts (Kopp, 1982; Luria, 1961; Wilson & Herrnstein, 1985). In varying degrees, cognitively based treatment draws on verbal abilities and strategies very closely aligned with the deficits that many conduct problem youths experience. Consequently, it would be reasonable for youths who are higher in these abilities to respond better to treatment.

A plausible alternative explanation is that age effects are accounted for in whole or in part by severity of dysfunction. In relation to conduct problem youths, later onset of dysfunction is associated with less severe and less enduring symptoms (see Kazdin, 1995). Youths whose conduct problems have an early onset show more stable and severe (e.g., aggressive) symptoms, greater family dysfunction, and a worse long-term prognosis, in addition to deficits in cognitive abilities (see Hinshaw, Lahey, & Hart, 1993; Moffitt, 1993; Patterson, Capaldi, & Bank, 1991). When younger and older youths are compared, the older group may perform better at the end of treatment, in part, because the older group includes some cases with a later onset, and hence less severe, conduct problems. Thus, severity of child dys-

function is another explanation of why older children may respond better to treatment. Although not usually studied, severity of dysfunction may also reflect diverse symptoms across a range of disorders. In clinical settings, conduct problem youths often show symptoms across a range of disorders and meet criteria for more than one diagnosis (e.g., Kazdin, Siegel, & Bass, 1992; Kendall, Reber, McLeer, Epps, & Ronan, 1990). Consequently, we also examined symptoms across a range of diagnoses in addition to history of conduct problems.

Differences in the proportion of boys and girls in comparisons of older and younger children could also contribute to the age-related effects. The reason is that the disproportionate ratio of boys to girls with conduct problems (e.g., 3:1 or 4:1) applies mostly to younger (early onset) cases; the proportion evens out considerably among late-onset conduct problem youths (see Zoccolillo, 1993). Studies showing that older children may respond better than younger children to cognitively based treatment could have a slightly larger proportion of girls in the older group, based on characteristics of later-onset conduct problems. Many of the abilities utilized in cognitively based treatment, such as perspective taking, empathy, and attention to contextual variables in social situations, are more evident in girls than in boys, as part of normal development (e.g., Zahn-Waxler, Cole, & Barrett, 1991). Building on these strengths, it may be that cognitively based treatment is more effective with girls, which could be reflected in older children (with proportionally more girls) showing greater responsiveness to treatment.

The main purpose of the present study was to examine the basis of prior findings that age moderates treatment outcome in cognitively based treatment. Cognitive functioning, as well as severity of child dysfunction, could readily explain or contribute to the age effects. Among the many cognitive abilities that might be studied, we examined intellectual functioning and reading achievement. In addition, we examined academic and school functioning of the children because these are very related to measures of intellectual functioning and achievement and also affect long-term prognosis of antisocial youths (Kazdin, 1995). Apart from cognitive and academic functioning, we also evaluated severity of child dysfunction because of its association with age in the case of conduct problem children. Two different measures were selected to represent dysfunction. History of conduct problems is known to predict poor long-term prognosis, as mentioned earlier. It is reasonable to expect that children with more diverse conduct problems in their past will be more difficult to treat. Consequently, we assessed the child's history of antisocial behavior including the scope of symptoms in the child's past. A second measure focused on the number of symptoms across the broad range of diagnoses. It is likely that youths

with greater dysfunction across multiple diagnoses (comorbidity) would also respond less well to treatment. Based on the above discussion, we predicted that children lower in intellectual functioning and reading achievement, and with greater academic and educational dysfunction, histories of conduct problems, and more symptoms across the diagnostic spectrum, would be less likely to respond to treatment. Child age and sex could be associated with cognitive abilities, as well as symptom impairment, for reasons noted previously, and were also examined.

While it is important to identify child variables as moderators of treatment, isolated child characteristics are likely to be related to other parent, family, and contextual influences (Brofenbrenner, 1979; Lerner, 1991). More specifically, cognitive/academic functioning and scope of clinical dysfunction are likely to be associated with coexisting parent, family, and contextual factors (e.g., socioeconomic disadvantage, parent psychopathology, high levels of stress) that may interfere with treatment participation and the magnitude of improvement. Parent, family, and contextual influences raise the prospect of a "package" of moderators that relate to treatment outcome and suggest a range of mechanisms through which moderators could operate. Also, once these factors are considered, cognitive/academic functioning and characteristics of child symptoms may no longer predict outcome. The present study evaluated intellectual functioning, reading achievement, academic impairment, history of conduct problems, and total number of symptoms as predictors of treatment outcome and the contribution of parent, family, and contextual factors with which they were likely to be associated. Parent, family, and contextual factors included socioeconomic disadvantage, difficult living circumstances, parent stress and dysfunction, and adverse child-rearing practices, which are known to influence prognosis of conduct problem youths outside of the context of treatment (see Kazdin, 1995).

METHOD

Participants

The study was conducted at an outpatient treatment clinic for children and families. Attendance to the clinic was initiated by families who contacted a triage center in a child psychiatry service. Children with aggressive, antisocial, or oppositional behavior were referred to the Child Conduct Clinic, where this study was conducted. After referral, children and families completed an initial evaluation to obtain diagnostic information, as well as

to assess diverse areas of child, parent, and family functioning. After assessment, treatment began, as described further below.

The study included 120 children (30 girls and 90 boys) who ranged in age from 7 to 13 years (M = 10.2, SD = 1.5). Seventy-seven (64.2%) of the children were Caucasian, 35 (29.2%) were African American, 7 (5.8%) were Hispanic, and 1 (.8%) was Asian American. To obtain diagnoses of the children, parents were interviewed using the Research Diagnostic Interview (Kazdin et al., 1992), a structured diagnostic interview to assess the presence, absence, and duration of symptoms, based on criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.) (DSM-III-R; American Psychiatric Association, 1987). The interview was modified from the Schedule of Affective Disorder and Schizophrenia for School-Age Children (Chambers et al., 1985). Reliability of Axis I diagnosis, from observation of the diagnostic interview by independent observers for 44 randomly selected cases over the period of recruitment, yielded high agreement (kappa = .95 across all diagnoses). Principal Axis I diagnoses included conduct disorder (42.9%), oppositional defiant disorder (36.1%), various other disorders including attention-deficit hyperactivity disorder, anxiety disorder, and major depression (15.0%), or cases did not meet criteria for a diagnosable Axis I disorder (5.9%). Most children in this sample (69.2%) met criteria for more than one disorder (M = 2.1, range = 0 to 5 disorders).

The primary caretaker of the child included biological mothers (90.8%), step, foster, or adoptive mothers (6.7%), or other relative or guardian (2.5%). Mothers ranged in age from 25 to 56 years (M = 34.9, SD = 6.2). Family head of household was usually the biological mother or father (74.2%); 40.0% of the children came from single-parent families. Family socioeconomic class (Hollingshead & Redlich, 1958) included (from lower to higher) Classes V (22.4%), IV (33.6%), III (26.7%), II (10.3%), and I (6.9%). Median monthly family income was $1,000 to $1,500 (range from 0 to $500 to > $2,500); 22.2% of the families received social assistance.

Assessment

Child predictors (intellectual functioning, reading achievement, academic impairment, history of antisocial behavior, total number of symptoms) of treatment outcome were assessed at intake. At the end of treatment, behavioral problems and prosocial functioning at home and at school served as the criteria to evaluate treatment outcome. Parent, family, and contextual domains, also assessed at pretreatment, included measures

of socioeconomic disadvantage, family constellation, parental stress and psychopathology, and adverse family child-rearing practices, as described further below. These domains, along with the child predictors, mentioned previously, place conduct problem children at risk for poor long-term prognosis and hence may make them less amenable to intervention (see Kazdin, 1995). Measures drew on varied assessment formats (interviews, questionnaires) and informants (e.g., parents, teachers, children).

Child Predictors. Child age and sex were assessed from the parent-completed General Information Measure that assesses child, parent, and family demographic variables. Level of intelligence was obtained from individual administration of two scales of the Wechsler Intelligence Scale for Children—Revised (WISC-R; Wechsler, 1974). Vocabulary and Block Design subtests were used to estimate full-scale IQ. These two subtests correlate highly (r = .91) with full-scale IQ, and, in combination, provide the best estimate of the total score, based on any combination of two subscales (Sattler, 1986). Second, reading level was assessed by the Wide Range Achievement Test—Revised (WRAT-R; Jastak & Jastak, 1978). The use of IQ and reading achievement to assess cognitive functioning is in keeping with other studies of antisocial children (see Moffitt, 1993; Patterson et al., 1991).

A related domain of academic and school functioning was obtained from the Risk Factor Interview (RFI; Kazdin, Mazurick, & Bass, 1993), a structured clinician-administered interview administered to the parents. The RFI assesses several domains related to onset of antisocial behavior and risk for poor prognosis (Kazdin, 1995; Robins & Rutter, 1990). The measure was developed in prior research showing that the domains predicted poor prognosis of hospitalized antisocial youths 1 to 2 years after discharge (Kazdin, 1989) and has been validated in studies that relate RFI subscales to socioeconomic disadvantage, parent and child impairment, and participation in treatment among families of conduct problem children (Kazdin et al., 1993; Kazdin, Mazurick, & Siegel, 1994). The RFI scales assess Academic/School Functioning of the Child, Child History of Antisocial Behavior, Poor Family Living Accommodations, Parent History of Antisocial Behavior (separately for each parent), Adverse Family Child-Rearing Practices (e.g., harsh punishment, poor monitoring of the child), and Child Peer Contacts (contact and activity with antisocial peers). Each scale includes multiple items rated for presence, severity, or degree of dysfunction. Scale scores are reached by summing items, with a higher score indicating greater dysfunction or presumed risk loading. For the present study, only selected scales were of interest. The Academic/School Functioning Scale of the RFI was used to assess how well or poorly the child was functioning at school. The scale includes 12 items, in yes-no format,

that focus on academic delays, academic achievement, and child status (e.g., child failing in class, ever left behind in a grade level).

Child symptoms or dysfunction at pretreatment were assessed in two ways. First, from the RFI, mentioned earlier, we used the Child History of Antisocial Behavior subscale. The scale includes 18 items, in a yes-no format, that assess diverse antisocial behaviors (e.g., fighting, stealing, vandalism, property damage) antedating the present episode leading to referral. The items reflect antisocial behaviors in the child's past. Second, from the intake diagnostic interview, mentioned earlier, we counted the total number of symptoms present across all DSM-III-R (APA, 1987) diagnoses (e.g., conduct disorder, oppositional defiant disorder, attention deficit disorder, anxiety disorder, depression, and others). Higher scores for this measure reflect a greater number of symptoms.[3]

Parent, Family, and Contextual Characteristics. Several parent, family, and contextual characteristics were assessed at intake and were included because they were expected to relate to key child characteristics of interest (cognitive/academic functioning, child symptoms) and treatment outcome. Family *socioeconomic disadvantage,* as a measure of the context in which the child lives, was assessed because of the pervasive influence on mental health and physical health outcomes (Adler et al., 1994), child intellectual functioning (Sattler, 1986), and treatment outcome of conduct problem youths (Dumas & Wahler, 1983). Socioeconomic disadvantage was operationalized in three ways. From the General Information Measure, we assessed Hollingshead and Redlich's (1958) level of educational and occupational attainment, family income (6-point scale where 1 = *0 to $500/month; 6 = > $2,500/month*), and whether the family received public assistance.

Characteristics of the *family constellation* were selected that are related to child dysfunction. Three measures were used including mother age, number of parents in the home, and relationship of the child to the head of household. Families with younger mothers, headed by single parents, or with a nonbiological caretaker as the guardian are at increased risk for poorer long-term prognosis (see Kazdin, 1995; Rutter & Giller, 1983). We expected these factors to related to severity of child impairment and hence to treatment outcome.

[3]As a measure of severity of dysfunction, we considered the number of diagnoses (comorbidity) for which a child met criteria as a possible measure. However, number of diagnoses has a restricted range (none to five in the present sample), is less sensitive as a result in representing the range of clinical symptoms, and ignores clinically important information (e.g., multiple symptoms the child may show that do not yield to diagnosis of a second or other disorder). Also, youths with the identical number of diagnoses could vary widely in the range of clinically significant symptoms within and across diagnoses. Consequently, we used total number of symptoms present across all diagnoses. Total number of symptoms across diagnoses was highly correlated with the number of diagnoses [$r(119) = .73$, $p < .001$].

Parent stress and dysfunction also are likely to be associated with current child dysfunction, as well as poor long-term child prognosis. Two measures to assess this domain were obtained from the Parenting Stress Index (PSI), a 120-item scale designed to assess several sources of stress to the parent (Abidin, 1990). The items (each rated by the parent on a 5-point scale) reflect areas of stress related to the child (e.g., demandingness, mood) and to the parents' views of their own functioning (e.g., restrictions of role, social isolation), and yield a total perceived stress score. In addition, a separate Life Stress scale of the PSI includes 19 items that measure life events (e.g., change in job, death of a relative) that are weighted based on prior research on their impact. Total stress and life events scores were used. Multiple forms of reliability and validity of PSI have been established in several studies (see Abidin, 1990).

Two measures of parent dysfunction were included. First, to sample a broad range of symptoms, parents completed the Hopkins Symptom Checklist (SCL-90; Derogatis & Cleary, 1977). The scale includes 90 items, rated on a 5-point scale, to reflect the degree of discomfort across several symptom areas. The total score was used as an overall index of psychiatric dysfunction of the parent. The SCL-90 scores correlate highly with clinical ratings and other measures of dysfunction (e.g., the Minnesota Multiphasic Personality Inventory), differentiate patient and nonpatient groups, and as a result have been widely used as a measure of dysfunction in adults. Second, from the (RFI), mentioned earlier, the Parent History of Antisocial Behavior subscale was used. The scale includes 18 items (Likert format) that encompass specific antisocial and delinquent behaviors in the parent's past (e.g., running away, stealing, property destruction, trouble with the law).

Finally, *adverse child-rearing practices* of the parents were assessed. From the RFI, the Adverse Family Child-Rearing Practices subscale was used. The subscale included 29 Likert-type items (1- to 5-point scale, *almost always* to *almost never*) that covered a range of child-rearing practices (e.g., use of harsh and inconsistent punishment, poor parent monitoring and supervision of the child). Adverse child-rearing practices characterize early onset and more severe cases of conduct problems (see Kazdin, 1995).

Treatment Outcome Assessment. Treatment outcome is multifaceted and no single measure or assessment modality provides a complete picture of therapeutic change. Parent and teacher ratings were selected as outcome criteria because (1) the measures permit evaluation of deviance and prosocial functioning and adjustment at home and at school, which are critically relevant outcomes; (2) normative data are available for the measures and hence provide a developmentally informed basis to evaluate the level of functioning of youths relative to nonreferred peers; and (3) these are the

most frequently used outcome criteria in child therapy research (Kazdin, Bass, Ayers, & Rodgers, 1990).

To evaluate child functioning at home, parents completed the Child Behavior Checklist (CBCL; Achenbach, 1991a). This measure includes 118 items, each rated on a 0- to 2-point scale, that comprise multiple behavior problem scales. The Total Behavior Problem score includes all items and reflects overall severity of dysfunction. The CBCL also includes a Total Social Competence score (comprised of subscale assessing child participation in activities, interactions with others, and school performance) which was used to evaluate prosocial functioning. The children's teachers in the community were mailed and completed the Child Behavior Checklist—Teacher Report Form (CBCL-TRF; Achenbach, 1991b). the measure parallels the structure of the parent version of the scale. The Total Behavior Problem scale was used to evaluate child dysfunction at school. The adaptive functioning summary score, a composite of four subscales (Working Hard, Behaving Appropriately, Learning, Happy), was used to evaluate positive adjustment at school. Parent and teacher ratings of child functioning were administered immediately before and after treatment. Posttreatment measures served as the outcome criteria to evaluate the predictors, noted previously.

Treatment Administration

After intake assessment, children and families began treatment. All children received problem-solving skills training (PSST), administered individually (once per week) for 20 to 25 sessions; each session was approximately 1 hour long and scheduled weekly (for approximately 7 to 8 months). The treatment originally derived from procedures developed by Spivack, Platt, and Shure (1976) and Kendall and Braswell (1985). Extensive modifications 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. The treatment combined cognitive and behavioral techniques to teach problem-solving skills (e.g., generating alternative solutions, means-ends thinking) to manage interpersonal situations (e.g., with parents, teachers, siblings, and peers; at home, at school, in community). Within the sessions practice, modeling, extensive role-playing, corrective feedback, and social and token reinforcement were used to develop problem-solving skills. Outside of the sessions, the child applied problem-solving steps to increasingly difficult interpersonal situations in everyday life. Parents were actively involved in the children's treatment. Parents were brought into the sessions to watch, then to assist

the therapist, and to foster use of the problem-solving steps in the child in treatment and in everyday life.

Treatment included a core set of sessions to convey central content areas, themes, and skills areas. Within the core sessions, child, parent, and family circumstances including problem areas, domains of dysfunction, special conditions of the family (e.g., living conditions, job schedules, custody issues, presence of extended family members) were accommodated. Occasionally, optional sessions were provided to address specific problems or to work on a theme that was not sufficiently well conveyed in the core session. Further details of the treatment program are provided elsewhere (Kazdin, 1996; Kazdin et al., 1992). Twelve full-time, masters-degree-level clinicians (10 female, 2 male; 11 Caucasian, 1 African American; ages 24 to 56 years) served as therapists.

RESULTS

Preliminary Analyses

Change over the Course of Treatment. Our prior evaluations have shown that children who receive the cognitively based treatment, highlighted previously, improve to a significantly greater degree than children who receive alternative treatment (e.g., relationship based play therapy) and control (e.g., attention placebo, contact only) conditions (e.g., Kazdin, Bass, Siegel, & Thomas, 1989; Kazdin et al., 1992). Although the present study was not concerned with comparison of different conditions, we were interested in assessing whether children who received problem-solving skills training improved over the course of treatment. Evaluation of improvements was based on pre to postchanges in parent and teacher CBCL scores. Table I provides the scores for subject demographic variables, pretest measures (predictors), and posttreatment outcomes (criteria). Within-group *t*-tests indicated that children improved over the course of treatment, as reflected in parent ratings of total behavior problems [$t(118) = 9.53, p < .001$] and social competence [$t(118) = 6.41, p < .001$] and in teacher ratings of total behavior problems [$t(116) = 6.57, p < .001$] and adaptive functioning [$t(115) = 4.74, p < .001$]. These changes reflected reductions in symptoms and increases in prosocial behavior, both at home and at school.

Data Reduction and Analyses. We predicted that cognitive/academic functioning (intelligence, reading achievement, school performance) and clinical dysfunction (child history of antisocial behavior, total number of symptoms across DSM diagnoses) would predict treatment outcome. The interrelations among these measures were examined to identify the poten-

Table I. Means and Standard Deviations (or Proportions) for Child, Parent, and Family Characteristics[a]

Domains/measures	Total sample (N = 120)	
	Means (%)	*SD*
Child characteristics		
Child age	10.18	1.53
Child sex—% male	75.00	
WISC-R full-scale IQ	100.71	17.23
WRAT-R	98.15	16.74
Academic/school dysfunction	17.47	2.86
History of antisocial symptoms	19.78	1.74
Total DSM-III-R symptoms	27.33	8.79
Parent-Child Behavior Checklist		
Pre Tot Beh Problems	70.58	9.04
Post Tot Beh Problems	63.01	10.00
Pre Soc Competence	38.20	8.33
Post Soc Competence	42.73	9.81
Teacher-Child Behavior Checklist		
Pre Tot Beh Problems	66.40	8.77
Post Tot Beh Problems	60.50	8.91
Pre Adaptive Functioning	36.31	7.84
Post Adaptive Functioning	39.99	9.39
Socioeconomic characteristics		
Hollingshead Class	45.17	17.98
Income Level	3.66	1.62
On Public Assistance	22.22	
Parent/family constellation		
Mother age	34.88	6.22
Single-parent family	40.00	
Head household bioparent	74.17	
Parent stress and dysfunction		
PSI Total score	264.45	50.77
Life events	9.65	8.25
SCL-90	45.53	41.84
Parent antisocial history	27.16	4.01
Other		
Adverse child rearing	52.12	6.77

[a]For the socioeconomic measure, Hollingshead and Redlich (1958) class reflects scores that convert to one of five classes; higher scores convert to lower socioeconomic classes; income level is based on a 6-point scale of monthly income, as described in the text; higher scores reflect greater income. WISC-R = Wechsler Intel-Achievement Test—Revised, DSM-III-R = *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.); Tot Beh = Total Behavior; Soc = Social; PSI = Parenting Stress Index; SCL-90 = Hopkins Symptom Checklist.

Table II. Correlations of Child Predictors of Interest[a]

	1	2	3	4	5	6	7
1. Child age							
2. Child sex	−.12						
3. WISC-R IQ	−.24	.13					
4. WRAT-R	−.18	−.06	.50				
5. Academic/school dysfunction	.22	.22	−.08	−.05			
6. History of antisocial behavior	.15	.05	.01	.06	.17		
7. Number of symptoms	.09	.06	−.01	.09	.19	.29	

[a]These are Pearson product-moment correlations. The correlations involving child sex (1 = *girls*, 2 = *boys*) are point-biserial correlations. Using an alpha level, not adjusted for the number of correlations, an $r \geq .15$ is significant at $p \leq .05$. WISC-R = Wechsler Intelligence Scale for Children—Revised; WRAT-R = Wide Range Achievement Test—Revised.

tial overlap among the predictors and hence suitability for inclusion as separate variables in subsequent regression analyses. Child age and sex were also included because of their possible relation to cognitive ability and symptom severity, as noted earlier. Pearson product-moment correlations were computed among the seven measures. The correlations, presented in Table II, generally were low and nonsignificant (median absolute value of $r = .12$, range .01 to .50). The highest correlations were between IQ and reading achievement ($r = .50$, $p < .001$) and between child history of antisocial behavior and total number of symptoms ($r = .29$, $p < .01$). Even these represented relatively little shared variance ($r^2 = 25\%$ and 8%, respectively). Similarly, child age and sex did not correlate highly with other measures (Table II). Overall, among the seven measures, there was very little overlap. Consequently, each was retained for the regression analyses in relation to treatment outcome.

Child Predictors of Outcome

Two separate criteria were used to evaluate posttreatment outcome. First, we were interested in total behavioral problems as a primary outcome measure.[4] We summed posttreatment *T*-scores of the Total Behavior Prob-

[4]Because the youths were referred for conduct problems, the Externalizing scale of the parent and teacher CBCL might be obvious choices for evaluation of treatment outcome. We used Total Behavior Problem scales instead to reflect the full range of symptoms for three reasons. First, the Externalizing and Total Symptom scales were highly correlated both on parent [$r(119) = .95$, $p < .001$] and teacher [$r(119) = .97$, $p < .001$] CBCLs. Second, because clinically referred children commonly have multiple symptoms, improvement across the full range of domains is of interest. Finally, Total Behavior Problem scores are widely reported in the literature. Our use of the Total scale may permit greater comparison of our results with those of others.

lem scales of the parent and teacher CBCLs. The composite *T*-score provided a single outcome measure of child symptoms at home and at school. Second, we were interested in positive, prosocial functioning, as a separate outcome domain. We summed posttreatment *T*-scores from the Parent Social Competence scale and Teacher Adaptive Functioning scale of the respective CBCLs to make a composite index of prosocial functioning.

We hypothesized that IQ, reading achievement, academic dysfunction, history of antisocial behavior, and number of symptoms would predict treatment outcome. Child age and sex were also of interest in light of their possible relation to these other variables and to outcome. Multiple-regression analyses were completed to evaluate these seven predictors assessed at pretreatment on composite Total Behavior Problem scores at posttreatment, as noted previously. All seven variables were entered into the prediction equation and yielded a significant function [$F(7, 92) = 6.96$, $p < .001$, with a multiple correlation $R = .59$ and $R^2 = .35$]. When evaluated separately with individual significance tests, reading achievement, academic dysfunction, and number of symptoms were significantly related to outcome (see Table III). Child age and sex also contributed to outcome. Child IQ and history of antisocial symptoms were not related to outcome. Overall, children who were higher in reading achievement, with less academic dysfunction at school, and with fewer symptoms across the diagnostic spectrum performed better in their total behavioral problems at the end of treatment. Also, older children and girls performed better at the end of treatment.

The analyses were repeated to evaluate posttreatment level of prosocial functioning as the measure of outcome. The seven variables of interest

Table III. Multiple-Regression Results for Child Predictors and Posttreatment Total Behavior Problems and Prosocial Functioning[a]

Child predictors	Total behavior problems		Prosocial functioning	
	Beta	*t*-Test	Beta	*t*-Test
Child age	−.22	−2.39[b]	.10	1.09
Child sex	−.24	2.63[c]	.09	<1
WISC-IQ	−.06	<1	.07	<1
WRAT-R	−.24	−2.50[c]	.20	1.98[b]
Academic/school dysfunction	.30	3.23[c]	−.46	−4.70[c]
History of antisocial behavior	.05	<1	.06	<1
Number of symptoms	.37	4.12[c]	−.10	1.07

[a]These are the results for regression analyses when all six predictors were entered. Significance levels refer to *t*-tests for the individual predictors. WISC-R = Wechsler Intelligence Scale for Children—Revised; WRAT-R = Wide Range Achievement Test—Revised.

[b]$p \leq .05$.

[c]$p \leq .001$.

led to a significant function in the regression analysis [$F(7, 91) = 4.82$, $p < .001$, multiple $R = .52$, $R^2 = .27$]. When predictors were evaluated individually (Table III), reading achievement and academic dysfunction were significant predictors of posttreatment prosocial functioning. Children higher in reading achievement and with a less severe academic dysfunction at school performed better at posttreatment.

Overall, the initial analyses indicated that reading achievement and academic dysfunction at school, and total number of symptoms at pretreatment predicted level of improvement at the end of treatment. Child age and sex emerged in the analysis in predicting posttreatment behavioral problems but not in predicting prosocial functioning.

The Influence of Parent, Family, and Contextual Characteristics

Concurrent Correlates of Child Domains. Evaluation of child characteristics in isolation may neglect the broader package of parent, family, and contextual factors with which these variables are likely to be associated. Additional analyses were completed to examine the extent to which intellectual functioning, reading achievement, child history of antisocial behavior, and total number of symptoms were related to, and explained by, measures of socioeconomic disadvantage, family constellation, parental stress and psychopathology, and adverse child-rearing practices.

Five separate multiple-regression analyses were completed in which the key child variable of interest (IQ, reading achievement, academic dysfunction, severity of antisocial symptoms, and number of symptoms) served as the criterion. Each analysis included all parent, family, and contextual variables as predictors, as previously described in the assessment section. All predictors were entered and a backward solution was used to identify the factors that remained in the equation. Using this solution, a significant function was obtained for predicting WISC-R IQ [$F(4, 100) = 7.99$, $p < .001$, $R = .49$, $R^2 = .24$], WRAT-R reading achievement [$F(3, 88) = 8.42$, $p < .001$, $R = .47$, $R^2 = .22$], history of antisocial behavior [$F(2, 102) = 6.47$, $p < .002$, $R = .34$, $R^2 = .11$], and total number of symptoms [$F(3, 100) = 31.41$, $p < .001$, $R = .70$, $R^2 = .49$]. Academic dysfunction was not predicted by parent, family, and contextual influences [$F(1, 103) = 3.64$, $p < .06$]; scrutiny of this borderline effect revealed only one factor that contributed to the prediction (life stressors) ($p < .06$). This influence did not emerge in any other regressions.

To identify robust factors, we retained for further evaluation only those parent, family, and contextual factors that emerged as significant in at least two of the five prediction equations. Four predictors emerged that

met this criterion: family income, family on social assistance, mother history of antisocial behavior, and adverse child-rearing practices. As might be predicted, lower family income, families receiving social assistance, parent history of antisocial behavior, and adverse child-rearing practices were associated with lower child IQ and reading achievement scores and with greater child history of antisocial behavior and number of child symptoms.

Expanding the Predictors of Treatment Outcome. The central interest was whether cognitive/academic functioning and child symptoms predict treatment outcome once parent, family, and contextual influences with which these are associated were controlled. To that end, hierarchical regression analyses were conducted to predict treatment outcome. In the analyses, family income, receipt of social assistance, parent history of antisocial behavior, and adverse child-rearing practices were entered into the prediction of child outcome as a block to determine whether the variables of interest (IQ, reading achievement, academic dysfunction, child history of antisocial behavior, total symptoms) added an increment to the prediction equation. Child age and sex were also included in this initial block to control for their contribution to outcome.

Entering the parent, family, and contextual variables and child age and sex as a block led to a significant function in predicting total behavior problems at the end of treatment ($F = 2.71, p = .01$). when these influences were controlled, child variables of interest (IQ, reading achievement, academic dysfunction, history of antisocial behavior, total number of symptoms), as a block, made a significant incremental contribution to the prediction ($F = 5.08$, $p < .001$, R^2 change $= .20$). Similarly, the analysis was completed to predict prosocial functioning at posttreatment. The initial block of control variables did not lead to a significant function in predicting prosocial behavior ($F = 1.66, p < .15$). Entering IQ, reading achievement, academic dysfunction, history of antisocial behavior, and total number of symptoms added a significant increment in predictive power ($F = 7.15$, $p < .001$, R^2 change $= .28$). These hierarchical regression analyses indicated that the cognitive/academic functioning and child symptom measures contributed significantly to prediction of outcome, both for total behavior problems and for prosocial functioning.

Hierarchical regression was used to test each of the cognitive/academic functioning and symptom measures individually, controlling for the parent, family, context, and other child (age, sex) variables. Table IV provides the increment of predictability of IQ, reading achievement, academic dysfunction, child history of conduct problems, and total number of symptoms, when these other factors were controlled. In relation to total behavior problems, academic dysfunction and total number of symptoms added significant increments in predicting outcome. IQ and reading achievement

Table IV. Hierarchical Regression for Child Predictors Controlling for Parent, Family, and Contextual Factors, and Child Age and Sex[a]

Child predictors	Total behavior problems		Prosocial functioning	
	R^2 change	F-test	R^2 change	F-test
WISC-IQ	.02	2.03	.03	2.74[b]
WRAT-R reading	.03	2.69[b]	.01	1.83
Academic/school dysfunction	.06	7.89[c]	.23	29.50[d]
History of antisocial behavior	.01	<1	.01	<1
Number of symptoms	.09	10.63[d]	.01	<1

[a]Each of the above variables was evaluated while controlling for family income, receipt of social assistance, mother history of antisocial behavior, adverse child-rearing practices, and child age and sex. Significance levels refer to t-tests for the individual predictor. WISC-R = Wechsler Intelligence Scale for Children—Revised; WRAT-R = Wide Range Achievement Test—Revised.
[b]$p < .10$.
[c]$p \leq .01$.
[d]$p < .001$.

only approached significance, as predictors of treatment outcome ($p < .15$, $p < .10$, respectively). In relation to prosocial behavior, only academic dysfunction added a significant increment once parent, family, contextual, and child age and sex were controlled, as noted in Table IV. IQ only approached making a significant incremental contribution once other factors were controlled ($p < .10$).

No predictions were made regarding interactions among the measures of cognitive/academic abilities and symptoms, child age or sex, as moderators for treatment outcome. Nevertheless, it is quite possible that child age and sex would interact with cognitive/academic functioning and symptom measures, in light of variations in course and influences on long-term prognosis for boys and girls (Zoccolillo, 1993). We evaluated each two-way interaction involving child age and sex with the IQ, reading achievement, academic dysfunction, history of antisocial behavior, and total number of symptoms. Hierarchical regressions were completed to evaluate the contribution of interactions, controlling for main effects, in predicting treatment outcome. Child Sex × IQ emerged as significant in predicting total behavior problems ($F = 9.79, p < .01, R^2$ change = .07) and approached significance in predicting prosocial functioning ($F = 3.14, p < .09, R^2$ change = .02). Girls with a higher IQ at pretreatment responded better to treatment than did girls with lower IQ. For boys there was no difference in outcome as a function of IQ. Worth nothing in passing is that there were no differences in mean IQ overall between boys and girls.

Overall, these results supplement the prior analyses in important ways by showing the contribution of cognitive/academic functioning and symptoms measures once other parent, family, contextual factors, child age, and sex are controlled. With respect to the primary treatment outcome measure, total behavioral problems at home and at school, academic dysfunction, and total number of symptoms made significant contributions to outcome. Cognitive abilities (IQ, reading achievement) only approached significance as contributors as main effects. IQ was a predictor of outcome for girls.

Lower Functioning and More Severely Disturbed Cases

The main findings are that children with higher reading achievement, less academic dysfunction, and fewer psychiatric symptoms across a range of diagnoses, responded better to treatment (i.e., showed better outcomes) compared to their more severely dysfunctional counterparts. Overall, the findings could be readily misconstrued as implying that treatment "works" only with mildly disturbed youths and perhaps youths who are higher functioning in cognitive/academic spheres and with minimal clinical dysfunction. However, subgroup analyses indicated that this was not the case.

Within-group *t*-tests from pretreatment to posttreatment were conducted to examine changes among subgroups of lower ability and more impaired children. Consider first the measure of academic dysfunction which was related to outcome. It is possible that those with greater dysfunction did not change over the course of treatment. A median split was made on the measure of academic dysfunction (median = 17.0, range = 13 to 16) to identify youths with greater and lesser academic dysfunction (above and below the median, respectively). Youths above the median (i.e., those with greater impairment) improved significantly from pre- to posttreatment on total behavior problems [$r(31) = 5.90, p < .001$] and prosocial functioning [$t(31) = 2.43, p < .05$]. As expected, youths with less academic dysfunction showed improvements as well in total behavioral problems and prosocial functioning ($ts = 8.75, 6.66, ps < .001$, respectively).

For IQ and reading achievement, similar analyses were completed. A median split of the sample for WISC-R full-scale IQ cases (median IQ = 100, range = 56 to 144) identified subgroups of lower and higher IQ. Youths lower in IQ (below the median) showed significant within-group improvements from pretreatment to posttreatment on total behavior problems [$t(62) = 7.25, p < .001$] and prosocial functioning [$t(60) = 4.82, p < .001$] on parent and teacher ratings; youths higher in IQ showed significant changes as well [$ts(53) = 8.31, 5.23, ps < .001$, respectively]. Youths below the median on the WRAT-R reading achievement (median = 101, range

= 62 to 138), improved significantly from pre- to posttreatment on the index of total behavior problems [$t(51) = 6.08$, $p < .001$] and prosocial functioning [$t(53) = 3.57$, $p < .001$]. For youths above the median and hence higher in reading achievement, improvements were evident in total behavioral problems [$t(53) = 7.09$, $p < .001$] and prosocial functioning [$t(53) = 3.75$, $p < .001$].

To examine youths with more symptoms of clinical dysfunction, a median split was used on the measure total number of symptoms. Youths above the median (median = 27, range = 5 to 49), and hence with more symptoms, improved significantly in total behavioral problems [$t(59) = 8.74$, $p < .001$] and prosocial functioning [$t(58) = 6.71$, $p < .001$]. Youths below the median in total number of symptoms, and hence less severely dysfunctional, also improved over the course of treatment on total behavior problems [$t(58) = 7.09$, $p < .001$] and prosocial functioning [$t(53) = 3.75$, $p < .001$]. Finally, a median split was completed for the measure of child history of antisocial behavior (median = 20, range = 16 to 24) to identify cases that were high and low in their dysfunction. Youths with higher levels of antisocial behavior in their past improved significantly from pretreatment to posttreatment on total behavior problem [$t(55) = 7.09$, $p < .001$] and prosocial functioning outcomes [$t(54) = 4.58$, $p < .001$]; youths with lower levels of antisocial behavior in their past significantly improved as well [$ts(56) = 7.86, 5.10$, $ps < .001$, respectively].

Overall, the conclusions are similar for the variables of interest. Youths who were more deficient in cognitive/academic skills (IQ, reading achievement, academic/school dysfunction) and more severely impaired (greater history of antisocial behavior, total number of DSM symptoms) still improved significantly with treatment. The primary difference was the greater magnitude of changes among their counterparts who were less severely impaired. It is possible that statistical regression and attenuation of the crises that precipitated referral contributed to an overall improvement of youths in general. Our prior data indicate that such broad improvements across outcome measures are unlikely with weak treatment or control conditions (e.g., Kazdin et al., 1989, 1992).

DISCUSSION

In prior research, older children have been found to respond better than younger children to cognitively based treatment (Durlak et al., 1991; Dush et al., 1989). The basis for this difference has not been elaborated. In the case of conduct problems, there are several factors that may explain these age effects. Primary among the possibilities are cognitive and aca-

demic functioning of the child and severity of dysfunction. In the present study, we evaluated intellectual functioning, reading achievement, academic and school dysfunction, child history of antisocial behavior, and total number of symptoms across a range of diagnoses. These factors are likely to moderate outcome in part because of their relation to prognosis of conduct problem youths (e.g., Robins & Rutter, 1990; Rutter & Giller, 1983).

The primary results indicated that academic dysfunction and total number of symptoms predicted treatment outcome. Children with greater academic dysfunction (school delays, failing) and with more symptoms at intake across a range of DSM disorders performed less well at posttreatment after completing cognitively based therapy. Cognitive ability (IQ and reading achievement) was less strongly related to outcome. As main effects, both IQ and reading achievement were "consistent" in separate analyses by lingering in the background at alpha levels one is hesitant (but usually compelled) to ignore ($ps < .15$, 10). Although IQ did not attain conventional levels of significance as a main effect, it did predict treatment outcome as an interaction with sex. For girls, higher IQ predicted a more positive outcome and provided an increment in predictive utility over the parent, family, and contextual variables. This was an interesting, but not predicted finding. As for reading achievement, this was a significant predictor of treatment outcome in the initial analyses. However, once a number of parent, family, and contextual variables were controlled, reading achievement no longer contributed to treatment outcome. Overall, it is clear that academic dysfunction and symptoms were the most robust predictors of outcome in the present study. The role of total number of symptoms, used as an index of comorbidity, conveys that nonconduct problem symptoms too play a role in treatment outcome, long suspected, but not well established with children.

Worth noting in passing is that child history of antisocial behavior did not emerge as a predictor of outcome. In current discussions of antisocial youths, history of antisocial behavior is accorded an important role in severity and long-term prognosis of conduct disorder. Early and late onset subtypes of conduct disorder, with their different prognoses, have been discussed in this context (Hinshaw et al., 1993; Moffitt, 1993). The failure of history of antisocial behavior to emerge may have resulted from the fact that all cases in the present sample were child onset. Also, the focus of the study was on diversity of antisocial behavior in the child's past rather than on the point of onset.

Child age contributed to outcome, which is consistent with conclusions from reviews of treatment outcome research for cognitively based treatment, as cited earlier. As in prior work, older children performed better at outcome than younger children. However, the effect was weak and

inconsistent across outcome measures, in comparison to the contributions of academic dysfunction and symptoms. The present results suggests that academic dysfunction and symptoms are much more crucial influences on outcome. The same comment might be made for child sex, which appeared as significant but was not consistent in its effects.

Several parent, family, and contextual factors (family income, parent on social assistance, parent history of antisocial behavior, and adverse child-rearing practices) were associated with the child intellectual functioning, reading achievement, academic dysfunction, total number of child symptoms, and child history of antisocial behavior. When these other influences were controlled, child academic dysfunction and total symptoms continued to predict outcome. Another way of stating the findings is to note that parent, family, contextual factors, in addition to child factors of interest, predicted outcome. The results draw attention to a broader set or package of child, parent, family, and contextual factors that predict level of functioning at the end of treatment. The information is helpful insofar as it begins to identify which children are likely to profit from cognitive-behavioral treatment. At the same time, precisely why child, parent, family, and context factors predict outcome and how they operate remain to be shown.

A number of limitations place constraints on the present results. First, the study focused on youths referred for externalizing (conduct) problems, evaluated cases recruited from a single outpatient clinic, and investigated only one form of cognitive-behavioral treatment. The generality of the findings could readily depend on these characteristics of the study. On the other hand, in at least one way, the results may help to extend the generality of prior research. Many studies of child therapy, including cognitive-behavior therapy, have focused on nonreferred children who are less likely to show the impairment evident in cases seen in clinical settings (see Kazdin et al., 1990). The present results show that moderators of treatment of cognitive therapy apply to clinically referred cases, most of whom evinced conduct problems and comorbid conditions.

Second, the assessment of treatment outcome was limited to parent and teacher ratings of dysfunction and prosocial behavior. These measures, as noted earlier, are the most commonly used measures in treatment studies with children and permit comparison of clinical cases with standardization and normative samples. Even so, other measures (e.g., delinquency, arrest records, direct observations of fighting) and assessment at different points over the course of follow-up might reveal different conclusions.

Third, the study was intended to shed light on an issue identified in the cognitive treatment literature of children. From the results, we can say that academic dysfunction, total number of symptoms across a range of diagnoses, and to a lesser extent IQ (for girls), reading achievement, and

selected parent, family, and contextual conditions with which they are associated, predict outcome following treatment. Strictly speaking, we cannot say whether these predictors only apply to this form of treatment or have broader applicability to many different types of treatment.

The bulk of the focus on child treatment research in general is on treatment technique, as reflected in studies comparing treatments to various control conditions or to other treatments. There has been a remarkable neglect of the many child, parent, family, and other factors that may affect treatment outcome (see Kazdin et al., 1990). As research develops, it may be useful to investigate factors (e.g., child, parent, family, and contextual characteristics) that predict positive treatment outcome across a range of treatments, as well as those that may be restricted to specific treatments. In the case of conduct problem youths, descriptive, epidemiological, and longitudinal studies provide a number of leads regarding factors that may make children more or less responsive to treatment (e.g., Moffitt, 1993; Werner & Smith, 1992).

Research on treatment moderators can have benefits for improvements in treatment outcomes among referred patients, as well as in our understanding how treatments operate. In relation to clinical care the success of treatment will not only depend on identifying more effective interventions, but also on directing cases to available treatments from which they are likely to profit. Moderating variables, whether based on child, parent, family, or contextual factors, can serve to direct youths to appropriate and optimally effective treatments. The present study was an initial step in this process by evaluating moderators that influence outcome in cognitively based treatment of conduct problem children. Multiple factors were evaluated and provide evidence that there are packages of domains that can contribute to outcome. Additional research will need to focus on the mechanisms through which such moderators operate and the generality of any particular set of moderators across clinical problems and treatment approaches.

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