

Prevention for Preschoolers at High Risk for Conduct Problems: Immediate Outcomes on Parenting Practices and Child Social Competence

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This study investigated the immediate impact of an 8-month center- and home-based prevention program for preschoolers at high risk for conduct problems. We report immediate program effects on observed and self-rated parenting practices and observed child behavior with peers. Ninety-nine preschool-age siblings of adjudicated youths and their families were randomly assigned to an enhanced version of the Incredible Years Series (Webster-Stratton, 1989; $n = 50$) or to a no-intervention control condition ($n = 49$). In an intent-to-treat design, the intervention yielded significant effects on negative parenting, parental stimulation for learning, and child social competence with peers. Improvements in negative parenting, stimulation for learning, and child social competence support the potential of the intervention to prevent later conduct problems in high-risk children.

Substantial evidence supports the need for selective prevention with children at high risk for antisocial behavior. More than 50% of crimes are committed by 5% of the population (Blumstein & Cohen, 1987), and the majority of individuals who commit crimes have histories of antisocial behavior in childhood (Caspi & Moffitt, 1995). The successful diversion of one child from a life of crime would result in economic benefits of approximately \$2 million per child (M. A. Cohen, 1998). Although a number of efficacious treatment strategies for youths with conduct disorder have been identified (Chamberlain & Reid, 1998; Henggeler, Schoenwald, & Pickrel, 1995), treatment is costly and often takes place after major consequences have ensued.

Prevention is now possible because of a rich literature on developmental pathways from early conduct problems to later antisocial and criminal behavior

(Broidy et al., 2003) and the identification of potentially modifiable risk factors for persistent antisocial behavior (Loeber & Farrington, 1998). The roots of conduct problems are established during early childhood for a substantial portion of antisocial youths (Campbell, 1995; Moffitt & Caspi, 2001). During the preschool period, difficult interchanges regarding compliance and independence are common (Cunningham & Boyle, 2002) and components of affect regulation, language skills, and behavioral control become organized (Dennis & Brotman, 2003; Kochanska, Murray, & Coy, 1997). Developmental challenges of the preschool period, including the transition to formal schooling, can be especially difficult for children with individual risk factors such as overactivity, impulsivity, social skills deficits, and delayed cognitive development (Campbell, Shaw, & Gilliom, 2000), as well as for children from socioeconomically disadvantaged and stressful family environments (Raver & Knitzer, 2002; Webster-Stratton & Hammond, 1998). Accordingly, prevention during the preschool period for children at risk for conduct problems is warranted (Domitrovich & Greenberg, 2004; Miller, 1998; Webster-Stratton & Taylor, 2001).

The literature provides clear evidence for the importance of parenting practices and child social competence as key early childhood risk factors for the development of conduct problems. Within the domain of parenting practices, coercive parenting and harsh discipline are the most robust predictors of child conduct problems (Dodge & Pettit, 2003; Haapasalo & Trem-

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blay, 1994; O'Leary, Smith Slep, & Reid, 1999). Families of children with conduct problems display higher rates of negative parenting behaviors (e.g., criticism, harshness, hitting) relative to families of nonproblematic children (Snyder & Stoolmiller, 2002). There is also evidence that limited reinforcement of positive child behavior and the lack of stimulation for learning in early childhood contribute to conduct problems, especially in children from disadvantaged backgrounds (Brotman, Kiely Gouley, O'Neal, & Klein, 2004; Dubow & Ippolito, 1994; Fagot, 1998; Wasserman, Miller, Pinner, & Jaramillo, 1996).

In addition to being exposed to problematic parenting, children with conduct problems often have difficulties in peer interactions (Webster-Stratton & Lindsay, 1999). Conversely, early social competence and positive peer experiences may protect against the development of conduct problems (Dodge, Coie, Pettit, & Price, 1990). Because early socialization at home influences children's social competence (Putallaz, 1987; Snyder, 2002), children from families characterized by high levels of negative parenting, low stimulation, and limited reinforcement of positive behavior are at risk for having difficulties in peer interactions in the preschool period (Brotman et al., 2004). Limited social competence, as well as problematic family experiences, can place children on a trajectory of increasing conduct problems and maladjustment (Vitaro, Tremblay, Gagnon, & Boivin, 1992).

A number of prevention trials have successfully targeted parenting practices and social competence in young children exposed to a variety of risk factors for conduct problems (Bierman et al., 2002; Eddy, Reid, & Fetrow, 2000; Gross et al., 2003). Only a few, however, have targeted preschoolers. The prevention trials by Webster-Stratton (1998) and Webster-Stratton, Reid, and Hammond (2001) with children enrolled in Head Start programs demonstrated that family-based prevention during the preschool period led to immediate improvements in parenting behavior and social competence as well as prevention of later conduct problems in kindergarten. Although the program was also found to be effective for a subgroup of higher risk families, including mothers with mental health problems and children with elevated behavior problems (M. Reid, Webster-Stratton, & Baydar, 2004), it is not possible to generalize these findings to very high-risk preschoolers, especially those not enrolled in educational or social service programs. This study examines whether an adaptation of this family-based approach to prevention leads to immediate changes in parenting practices and social competence in preschoolers at great risk for conduct problems.

In this study, we selected preschool-age siblings of antisocial youths as a strategy for targeting a high-risk sample of previously unidentified or unaffiliated preschoolers. A large literature using diverse methodolog-

ical approaches provides strong evidence for risk conferred via siblings (Bank, Burraston, & Snyder, 2004; Compton, Snyder, Schrepferman, Bank, & Shortt, 2003; Patterson, 1984; J. B. Reid, Patterson, & Snyder, 2002; Rowe, Rodgers, & Meseck-Bushey, 1992; Wasserman et al., 1996). Younger siblings of antisocial youths are at risk for conduct problems for both genetic (Reiss, Neiderhiser, Hetherington, & Plomin, 2000; Rowe, Almeida, & Jacobson, 1999) and environmental reasons (Compton et al., 2003).

The same factors that place children at risk for conduct problems may also serve as barriers to enrolling and engaging families into prevention trials and as barriers to change in parenting practices and child behavior. The feasibility of recruiting and engaging urban families with an antisocial family member in a prevention trial using a family-based approach was tested in a randomized study with 30 preschoolers who had family members (mostly siblings) with documented histories of antisocial behavior (Brotman et al., 2003). We established adequate levels of attendance at group and home-based sessions as well as satisfaction with program content and program delivery strategies. Moreover, findings suggested potential intervention benefits on observed parenting practices immediately following intervention.

This study expands on the initial study in a new sample of preschool-age siblings of antisocial youths. We identified families through an urban family court system to yield families with preschoolers who had an adolescent sibling recently adjudicated for a delinquent act. This approach resulted in a well-defined target population and a sample of preschoolers who were not yet exhibiting high rates of clinically significant behavior problems but who had multiple well-validated sociocultural, parenting, and child risk factors for conduct problems (Brotman et al., 2004). This study evaluated immediate outcomes on parenting practices and child behavior with peers. Specifically, we examined (a) harsh disciplinary practices and criticism, (b) praise and reinforcement for prosocial behaviors, (c) cognitive stimulation for learning, and (d) child social competence. We hypothesized that intervention would result in immediate group differences on these four outcomes. We also examined immediate outcomes on child disruptive behavior. Given the relatively low level of problematic behaviors in these young children, however, we did not hypothesize immediate group differences in this domain.

Method

Participants

Families were identified over a 5-year period from family court records of youths adjudicated in Man-

hattan and the Bronx, NY. Children under 16 years of age who commit acts considered crimes when perpetrated by adults are adjudicated in family court. Probation reports that described family composition were screened for a sibling under the age of 5 years. For this study, *sibling* was defined as a preschooler who was biologically related to or lived with the adjudicated youth for at least 1 year and whose caregiver also raised the adjudicated youth. Families were eligible if a sibling was between 2 years 9 months and 5 years 3 months, if the caregiver spoke English, and if the family lived in Manhattan or the Bronx. Families were deemed ineligible if the caregiver had a *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) current substance use or psychotic disorder determined by structured diagnostic interview or if the preschooler had a pervasive developmental disorder or severe or profound mental retardation as reported by parents or indicated by structured cognitive or psychiatric child assessments. Families were sent a description of the study and given the option of refusing contact (<1% refused). Eligibility and interest were established with a phone screen. Informed signed consent was obtained during a visit at the study center or the family's home.

Court records of 6,909 youths were screened over 5 years. Eighteen percent ($n = 1,228$) indicated the presence of a young sibling. Of these, we were able to contact 47% of families; 33% of contacted families had age-appropriate siblings living at home and met other study requirements (e.g., location, language).¹ Forty-eight percent of eligible families completed assessments and entered the study. The sample included 92 families with 99 preschoolers (7 families had 2 preschoolers) identified via 90 adjudicated delinquents (4 families were identified via 2 adjudicated youths). Of the 90 adjudicated youths, more than half ($n = 49$) lived at home with the participating family at study entry. Eighty-three percent of adjudicated youths were male, with a mean age of 15.6 years ($SD = 1.3$). Sixty-eight percent were biological siblings of study preschoolers (12% full, 56% half); 3% were adoptive siblings; and 28% were uncles, aunts, or cousins raised as siblings. Fifty-seven percent were adjudicated in Manhattan and 43% in the Bronx. Twenty-five percent were adjudicated for personal crimes, 31% property crimes, 16% personal and property crimes, and 29% substance-related crimes. We compared age, gender, race or ethnicity, borough, and type of charge for youths whose families entered the trial with all adjudicated youths screened. Adjudicated siblings of study families were younger ($M = 15.60$, $SD = 1.33$) than all adjudicated

youths ($M = 16.09$, $SD = 1.59$), $t(6762) = 2.79$, $p < .01$. Study adjudicated youths were also more likely to be African American (75%) and less likely to be Hispanic (22%) compared with all adjudicated youths (53% African American and 43% Hispanic), $\chi^2(2, N = 6,041) = 12.90$, $p < .01$.²

Eighty-three percent of caregivers (referred to as *parents* in this article) were the preschooler's biological mothers, 2% biological fathers, 10% grandmothers, 3% adoptive mothers, and 2% other female relatives. Parent mean age was 36.30 years ($SD = 9.2$). Sixty-one percent were African American, 24% Hispanic, and 15% other. Preschoolers were, on average, 3.94 years ($SD = 0.7$). Fifty-three percent were girls, and 43% were not enrolled in a preschool, school, or group day care. The high-risk status of the preschoolers and their families is described elsewhere (Brotman et al., 2004). Nearly half of parents had not completed high school, and 59% of families had household incomes under \$15,000. The average child IQ score (Elliott, 1990) was 83.20 ($SD = 12.9$) and the average *T* score on the Externalizing scale of the Child Behavior Checklist-Parent version (Achenbach, 1999; Achenbach, Edelbrock, & Howell, 1987) was 50.99 ($SD = 10.24$). Thirteen percent exhibited clinically elevated externalizing problems (Child Behavior Checklist *T* scores above 63) and an additional 10% were in the borderline clinical range (*T* scores between 60 and 63).

Procedure

Five cohorts were enrolled in the trial over 5 years. Families were randomized to condition after baseline assessments were completed in each cohort.³ Forty-seven families (50 preschoolers) were randomized to intervention and 45 (49 preschoolers) to control conditions. Baseline assessment (T1) included three visits and postintervention assessments (T2; approximately 8 to 10 months later) included two visits. At both times, at least one visit was at the study center and one was at home. Parents received \$100 for T1, \$50 for T2, and reimbursement for travel. Families were not paid for inter-

²Based on a subset of families, we also compared adjudicated youths whose families entered the trial with those who were deemed eligible but did not enter. Results were similar to those from comparisons with all adjudicated youths. Adjudicated youths whose families entered the trial were younger ($M = 15.81$, $SD = 1.22$) than youths from eligible families who did not enter ($M = 16.53$, $SD = 1.06$), $t(102) = 3.22$, $p < .01$. Study adjudicated youths were also more likely to be African American (80%) and less likely to be Hispanic (18%) than youths deemed eligible who did not enter the study (55% African American and 43% Hispanic), $\chi^2(2, N = 89) = 6.58$, $p < .05$.

³In two instances, 2 preschoolers in separate families were related to the same adjudicated youth. Each pair was "yoked" for purposes of randomization so that the related pair would be assigned to the same condition. One pair was randomized to intervention and one to control.

¹Percentages are estimates based on cases with complete dispositional data.

vention; they were reimbursed for transportation costs and received meals and other incentives during groups.

Prevention program. The prevention program was designed to improve parenting practices and preschoolers' social competence with the goal of preventing later conduct problems. The prevention program included 22 weekly 2-hr group sessions for parents and preschoolers (90-min parent and child groups and 30 min of parent-child interaction), 10 biweekly 90-min home visits, and up to 6 additional family visits provided over a 6- to 8-month period in the winter and spring.⁴ The parent-child interactions, children's groups, home visits, and additional visits were added to the parenting groups to facilitate change and generalization in families with multiple risk factors for conduct problems. Simultaneous intervention with parents and preschoolers, as well as center and home-based components, were intended to complement and reinforce effects of the other interventions. Home and additional family visits were designed to allow interventionists flexibility in their approach to address potential barriers to change.

Parenting groups used the Parent Program (Basic Preschool Version) from the Incredible Years Series, a manualized videotape modeling intervention (Webster-Stratton, 1989). The program encourages parents to use nonharsh, consistent, and appropriate disciplinary strategies, be less critical, and use positive reinforcement and play interactions to promote children's social competence. Two group leaders conducted groups with 6 to 10 parents in accordance with a collaborative approach (Webster-Stratton & Herbert, 1994). Leaders used videotape vignettes as starting points for discussions, problem solving, and role-playing. Program adaptations are detailed in a procedures manual (Brotman, 2002).

Groups for preschoolers (Brotman, 2002) incorporated elements from the Incredible Years Dinosaur Social Skills and Problem-Solving Curriculum (Webster-Stratton, 1990), which has been shown to increase the efficacy of the parent program (Webster-Stratton, Reid, & Hammond, 2004). Leaders taught social skills, reinforced positive behaviors, and provided consequences for negative behaviors. Free play and meals provided opportunities for socialization. Groups enabled leaders to observe children and share information with parents about children's capacities

and responses to behavioral strategies. Groups exposed children to techniques that parents were learning (e.g., sticker charts, time-out) with the goal of increasing children's positive responses to these procedures at home.

To provide parents direct practice of targeted program techniques and strategies, the last 30 min of the 2-hr group time consisted of parent-child activities (e.g., arts and crafts, free play). Leaders coached parents to use specific parenting skills (e.g., labeled praise, time-out) and modeled, directed, and reinforced appropriate cognitive-behavioral strategies (Brotman, 2002; Webster-Stratton & Herbert, 1994). The practicing of newly learned skills during parent-child interactions is similar to approaches taken in other treatment and prevention programs (Conduct Problems Prevention Research Group, 1992; Eyberg & Boggs, 1998). Activities involved low-cost materials that parents could use at home. At the end of the activity, children signed out a book from a "lending library," and parents were encouraged to read to their children daily.

Home visits were designed to help parents implement skills at home. Leaders from the parent and children's groups together provided home visits following a curriculum corresponding to parent and preschool group lessons (Brotman, 2002). Home visits created opportunities for developing and implementing behavior plans (e.g., placement of a time-out chair in a crowded apartment, creating a safe environment for play, using existing resources at home to stimulate learning). If requested by parents and following program guidelines and discussion during clinical supervision, up to six additional family visits were provided in the home or community (e.g., identification of unmet needs, linkage to community resources).

Nine female psychologists or doctoral candidates conducted seven parenting groups over a 5-year period. The principal investigator and five group leaders were trained in the Incredible Years program by its developer. All leaders had clinical experience with parents from urban communities and had previously delivered the manualized program in clinical settings. Intervention fidelity was assured with standardized manuals and materials, comprehensive training, and weekly monitoring and supervision of intervention implementation. Group leaders completed integrity checklists of content and process that accompany the published intervention manuals (Webster-Stratton, 1989). The principal investigator reviewed checklists during weekly clinical supervision of group leaders and received consultation from Dr. Webster-Stratton throughout the study.

Control condition. The control condition consisted of assessments and monthly phone calls through which we evaluated family service use and changes to family circumstances (e.g., moves, deaths, incarceration). Parents were paid \$5 for these monthly phone in-

⁴Families were also offered five group booster sessions and two home visits in the fall of the next year. Because they occurred after postassessment, they are not considered in this study of immediate intervention effects. Families with children between 5 and 17 years were offered concurrent preventive interventions that took place at the same time as the weekly parent and preschool groups. Rationale and details about program elements for siblings, as well as intervention outcomes for siblings, are reported elsewhere (Brotman et al., in press).

interviews. If families requested assistance with identifying social, educational, or mental health resources during these calls, a clinician followed up with information provided over the telephone.

Measures

Negative and positive parenting practices. Parenting practices were assessed via parent interviews (the Parenting Practices Interview [PPI]; Webster-Stratton (1985), adapted from the Oregon Social Learning Center Discipline Questionnaire) and observations at home. Observations of parent-child interactions were coded live by raters blind to intervention status during a 10-min parent-child activity (5 min of child-directed free play and 5 min of a parent-directed puzzle task) using two coding systems. The Dyadic Parent-Child Interaction Coding System-Revised (DPICS-R; Webster-Stratton 1985, adapted from Robinson & Eyberg, 1981) was used to record the frequency of discrete parenting behaviors. We calculated the average rate per minute across the two tasks (free play and puzzle). The Global Impressions of Parent-Child Interactions (GIPCI; Brotman, 2003) was used to make global ratings of parenting style. GIPCI ratings were made on a 5-point scale using descriptions of prototypic behaviors. Approximately 25% of live interactions were coded by two raters. Interrater agreement was calculated as per Shrout and Fleiss (1979) via single-measure intraclass correlation coefficients (ICC) with a one-way random-effects model, (1, 1).

Negative parenting was assessed with two parent-report scales from the PPI, derived from closed-ended (Harsh-C) and open-ended (Harsh-O) responses. PPI Harsh-C was the average of four items asking how often parents used harsh approaches to discipline (yell, slap or hit, raise voice or scold, and spank), rated from 0 (*never*) to 3 (*frequently*). Internal consistency at both time points was adequate (T1: $\alpha = .77$; T2: $\alpha = .81$). For PPI Harsh-O, parents were asked how they would react to nine scenarios involving child misbehavior (e.g., hitting, tantrums). Responses were coded by two raters who were blind to intervention status as 0 (*not harsh*) or 1 (*harsh*; e.g., hitting, yelling). Scores from the two raters were averaged across the nine items. Interrater agreement, ICC(1, 2) (Shrout & Fleiss, 1979), was high, T1: ICC(1, 2) = .94; T2: ICC(1, 2) = .85. We created a Self-Reported Negative Parenting composite by rescaling and averaging scores on PPI Harsh-C and PPI Harsh-O (T1: $r = .27, p < .05, N = 90$; T2: $r = .39, p < .05, N = 75$). Reliability of the composite index, calculated as the ratio of estimated true score variance (weighting the variance of each component by its respective reliability estimate and adjusting for the correlation between the two) to total variance (the sum of the two variances adjusted for the correlation; Lord & Novick, 1968), was high (T1 = .86; T2 = .86).

We considered DPICS-R Critical Statements (e.g., “you are not trying”; “that’s stupid”) and the GIPCI Harsh rating as measures of negative parenting. Interrater agreement was high for DPICS-R Critical Statements, T1: ICC(1, 1) = .90; T2: ICC(1, 1) = .92, and adequate for GIPCI Harsh, T1: ICC(1, 1) = .55; T2: ICC(1, 1) = .79. We created an Observed Negative Parenting composite by rescaling and averaging scores on DPICS-R Critical Statements and GIPCI Harsh (T1: $r = .36, p < .01, N = 90$; T2: $r = .33, p < .01, N = 69$). This resulted in a composite score with high reliability (T1 = .84; T2 = .90).

Positive parenting was assessed with one item from the PPI asking how often parents praised or rewarded their child for good behavior. PPI Praise responses were coded on a 5-point scale from 1 (*less than once a week*) to 5 (*many times a day*). We considered DPICS-R Praise codes, including labeled (e.g., “Thanks for putting the blocks away as soon as I asked”) and unlabeled (e.g., “good boy”) praise. Interrater agreement for DPICS-R Praise was high at both times, T1: ICC(1, 1) = .94; T2: ICC(1, 1) = .96. We also used three GIPCI codes: Valence, Responsiveness, and Affection. The three ratings were averaged to create a scale with high internal consistency (T1: $\alpha = .84$; T2: $\alpha = .83$) and adequate interrater agreement, T1: ICC(1, 1) = .79; T2: ICC(1, 1) = .68. DPICS-R and GIPCI ratings were intercorrelated at each time (T1: $r = .42, p < .001, N = 90$; T2: $r = .39, p < .01, N = 69$). We created a composite for Observed Positive Parenting that was highly reliable (T1 = .93; T2 = .91).

Stimulation for learning. The Home Observation for the Measurement of the Environment-Early Childhood version (Caldwell & Bradley, 1984) was used to assess stimulation for learning. Raters, blinded to intervention status, used observation and interview questions to establish presence (coded as 1) or absence (coded as zero) of 55 items (e.g., “Child has at least 10 children’s books,” “Child is encouraged to learn colors”). We considered items from three stimulation subscales from the Home Observation measure (Learning, Language, and Academic Stimulation), retaining only those items that loaded above .40 in exploratory factor analysis. Similar procedures have been used in other intervention trials (Totsika & Sylva, 2004). An 11-item scale score was derived by averaging item scores and had a possible range from 0 (*no items endorsed*) to 1 (*all items endorsed*). Internal consistency at both times was high (T1: $\alpha = .84$; T2: $\alpha = .79$).

Child social competence and disruptive behavior. We developed an observational procedure for this study called the Observed Peer Play in Unfamiliar Settings (OPPUS), to provide an independent measure of behavior with peers that would not rely on school attendance (nearly half were not in school) and would be un-

biased by knowledge of intervention status. Details of this procedure, including psychometrics and correlations with other measures of child functioning, are detailed elsewhere (Brotman, Gouley, & Chesir-Teran, 2005). Observations were made during a visit to a neighborhood preschool as part of the 2-hr assessment at the research center. Prior to leaving for the preschool, a research assistant explained to the child that he or she was “going to a school to play with some other children.” Two or three research assistants escorted the child and his or her parent to the preschool. On arrival, the child separated from the parent and entered the play area with one or two assistants who observed the child during 30 min of free play. At the end of the observation period, observers who were blind to intervention status rated child behavior on four global items with a 5-point scale of 0 (*not at all*), 1 (*minimally*), 2 (*somewhat*), 3 (*very*), or 4 (*extremely*): (a) How socially skilled was this child during the interaction? (b) How disruptive was this child? (c) How disconnected or withdrawn was this child? (d) Overall, how well did the child fit into the play situation? Ratings for Socially Skilled, Disconnected, and Fit In were highly intercorrelated ($r > .80, p < .001$) and combined to create an OPPUS Engaged scale (Disconnected was reverse coded). The disruptive item was not significantly correlated with OPPUS Engaged ($r = .03, p = ns$) and was retained as a single-item measure of disruptive behavior. OPPUS Engaged scores ranged from zero to 4 and were normally distributed ($M = 1.98, SD = 1.13$). Coefficient alpha (T1: $\alpha = .94$; T2: $\alpha = .96$) and interrater agreement were high at both times, T1: ICC(1, 2) = .95; T2: ICC(1, 2) = .90. OPPUS Disruptive scores ranged from zero to 4 and were somewhat positively skewed ($M = .40, SD = .75$). Interrater agreement was high at both times, T1: ICC(1, 2) = .91; T2: ICC(1, 2) = .89. OPPUS Engaged and Disruptive scores were significantly related to observed behavior during parent-child interactions but not to age, gender, race or ethnicity, or school experience (Brotman et al., 2005).

Parental satisfaction. Parents in the intervention condition completed a satisfaction form (Webster-Stratton, 1989) at the end of each group session. They rated how helpful they found six program components: (a) content, (b) videotape vignettes, (c) group discussions, (d) leaders’ comments, (e) homework, and (f) parent-child interactions. Components were rated on a 4-point scale from 0 (*not helpful*) to 3 (*very helpful*). A total satisfaction score was calculated by averaging all ratings.

Results

Preliminary Analyses

Baseline equivalence of intervention and control groups. We compared intervention and control groups on six demographic characteristics (child age, gender, race or ethnicity, income, single-adult house-

hold, and parent education) and all outcomes (Self-Reported and Observed Negative Parenting, Self-Reported and Observed Positive Parenting, Stimulation for Learning, OPPUS Engaged and Disruptive). There were no baseline group differences on the demographic characteristics or child outcomes. Two of the five measures of parenting practices differed at baseline. Intervention parents were observed to be more negative than controls, $F(1, 88) = 5.59, p < .05$, and intervention parents rated themselves as using more praise than controls, $F(1, 88) = 4.71, p < .05$. These differences were accounted for in the repeated-measures design of the parenting outcome analyses.

Attrition analyses. We evaluated main attrition effects that might limit generalization and differential group attrition that might bias results of an intervention effect. Eighty-five percent of intervention families and 84% of controls were retained at T2. These rates were not different, suggesting that intervention status did not differentially influence attrition. We conducted a series of two-way analyses of variance (Group \times Attrition Status) for the six demographic factors, five measures of parenting practices and two measures of child behavior. An examination of main effects yielded 2 (of 13) differences: Parents who were not retained at T2 had higher Self-Reported Negative Parenting ratings at T1 ($M = 1.20, SD = 0.4$) than did parents who were retained ($M = .92, SD = 0.4$), $F(1, 88) = 5.50, p < .05$. This was true for both intervention and control conditions. For both intervention conditions, children who were not retained were younger ($M = 3.60, SD = .64$) than children who were retained ($M = 4.00, SD = .69$), $F(1, 88) = 4.02, p < .05, \eta^2 = .04$. There was also 1 (of 13) significant Attrition \times Intervention Status interaction: Intervention parents who were not retained at T2 scored higher on Observed Positive Parenting at T1 ($M = 1.29, SD = 0.6$) than parents who were retained ($M = 1.04, SD = 0.4$), whereas controls who were not retained had lower scores ($M = .86, SD = 0.4$) than those who were retained ($M = 1.11, SD = 0.4$), $F(1, 88) = 4.00, p < .05$. All other analyses of variance testing for the effects of attrition were nonsignificant with effect sizes for main effects ranging from $\eta^2 = .00$ to $\eta^2 = .02$ and for interactions ranging from $\eta^2 = .00$ to $\eta^2 = .03$.

Attendance and Satisfaction

Attendance. Of the 40 intervention families who completed T2 assessments (included in this report), 1 family did not attend any groups. The average attendance at groups (for all families assigned to intervention) was 13 sessions ($SD = 7$), and the mean number of home visits was 6 ($SD = 3$). Sixteen families (40%) received at least 1 additional contact ($M = 4, SD = 5$), requiring an average of 7 ($SD = 9$) hr per family. The

most common reasons included mental health issues, legal issues, and basic needs.

Satisfaction. The total satisfaction rating for the program was 2.62 ($SD = 0.3$), midway between 2 (*helpful*) and 3 (*very helpful*). The six components were rated as follows: group discussions, $M = 2.72$, $SD = 0.3$; leaders' comments, $M = 2.72$, $SD = 0.3$; parent-child interactions, $M = 2.67$, $SD = 0.4$; content, $M = 2.59$, $SD = 0.4$; homework, $M = 2.54$, $SD = 0.4$; and videotape vignettes, $M = 2.49$, $SD = 0.5$.

Intervention Effects

Imputation of missing data and analytic approach. Seven families had partially missing data for parenting at T1, and 21 families had partially missing data at T2. Partially missing T1 data were imputed by regressing the variable with missing data on remaining variables and using the regression equation to calculate predicted values (adding in random error). For those with partially missing parenting data at T2, a multiple imputation strategy was used. Missing values were imputed six times with regression equations for intervention and control groups to generate six separate datasets (Schafer & Graham, 2002). Analyses of intervention effects were replicated within each of the imputed datasets. Parameter estimates were combined as per Rubin (1987) with software developed by Schafer (1999). Data were not imputed for social competence or disruptive behavior because there was only a single measure of each of these outcomes.

We evaluated intervention effects on the major outcomes of interest via a series of 2×2 (pre-post by intervention condition) repeated-measures analyses of variance using an intent-to-treat design, with all cases included irrespective of attendance. For families with

more than one preschooler ($n = 7$), analyses of the three parenting outcomes considered parenting of the target child (i.e., the child closest to 4 years of age). For Negative and Positive Parenting, we first tested intervention effects at the construct level via multivariate analyses of variance. Significant multivariate effects were followed by univariate analyses to isolate effects on self-report and observational measures. Analyses of social competence and disruptive behavior outcomes were conducted with all children and repeated for target children only. These analyses yielded highly similar results, and therefore we report on findings for the full sample. Effect size was examined via η^2 , which can be interpreted as the percentage of variance accounted for by intervention status. As per J. Cohen (1988), $\eta^2 \geq .01$ is considered a small effect, $\geq .06$ is medium, and $\geq .14$ is large. Significant Time \times Intervention interactions were followed up with post hoc examinations of the repeated-measures effect of time (pre to post) within intervention condition.

Parenting practices. As shown in Table 1, the intervention led to significant Group \times Time interactions on two of the three parenting domains. There was a significant intervention effect on Negative Parenting, $F(2, 75) = 7.24$, $p < .01$. This interaction effect was large ($\eta^2 = .17$). This construct-level effect was accounted for by significant Group \times Time interactions for parent ratings, $F(1, 76) = 9.62$, $p < .01$, $\eta^2 = .11$, and blind observations of parenting at home, $F(1, 76) = 4.02$, $p < .05$, $\eta^2 = .05$. For both measurement strategies, there were similar patterns of change, with significant decreases in Negative Parenting in the intervention group and no change in the control group.

The intervention also led to significant group by time interactions for the Stimulation for Learning variable, $F(1, 76) = 7.08$, $p < .01$. This effect was medium

Table 1. Intervention Effects on Parenting Practices and Child Social Competence

Measure (Potential Range)	Control				Intervention				Group \times Time ANOVA		
	Pre		Post		Pre		Post		<i>df</i>	<i>F</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Negative Parenting ^a									2, 75	7.24**	.17
Self Ratings (0–3)	0.86	0.34	0.92	0.39	0.99	0.46	0.80	0.42 ^b	1, 76	9.62**	.11
Observations (0–4)	0.77	0.56	0.80	0.59	0.96	0.75	0.65	0.61 ^b	1, 76	4.02*	.05
Positive Parenting ^a									2, 75	0.16	.01
Self Ratings (1–5)	3.33	1.37	3.40	1.45	3.96	1.04	3.85	1.13	1, 76	0.29	.00
Observations (0–4)	1.11	0.40	1.11	0.52	1.04	0.44	1.02	0.53	1, 76	0.04	.00
Stimulation for Learning											
HOME—Stimulation (0–1)	0.78	0.18	0.65	0.28 ^b	0.67	0.30	0.72	0.22	1, 76	7.08**	.09
Child Social Competence											
OPPUS—Engaged (0–4)	1.85	1.14	1.56	1.15	1.86	1.13	2.16	1.06 ^c	1, 69	4.57*	.06
Child Disruptive Behavior											
OPPUS—Disrupt (0–4)	0.33	0.74	0.17	0.45	0.49	0.82	0.61	1.03	1, 69	1.66	.02

Note: HOME = Home Observation for Measurement of the Environment; OPPUS = Observed Peer Play in Unfamiliar Settings.

^aMultivariate. ^bChange from baseline score is different from zero ($p < .05$). ^cChange from baseline score is different from zero ($p < .10$).

* $p < .05$. ** $p < .01$.

in size ($\eta^2 = .09$). The pattern for this construct (evaluated via a combination of blind observations and parent interview) was for controls to deteriorate significantly over time with no significant change in the intervention group. There was no Group \times Time interaction for Positive Parenting, $F(2, 75) = .16, p = ns, \eta^2 = .01$. Both groups remained relatively stable over time.

Child social competence and disruptive behavior. As shown in Table 1, the intervention had a significant effect on Child Social Competence, $F(1, 69) = 4.57, p < .05$. This effect on child engaging behavior during a peer entry task was medium in size ($\eta^2 = .06$). Children assigned to intervention and control conditions changed in opposite directions such that intervention children increased in OPPUS Engaged scores relative to controls who decreased over time (although within-group change was not significant). As expected, there was no Group \times Time interaction for OPPUS Disruptive scores, $F(1, 69) = 1.66, p = ns, \eta^2 = .02$. Mean levels of disruptive behavior remained relatively low over time in both intervention and control conditions.

Discussion

Previous prevention efforts with preschoolers have been successful in strengthening parenting practices and social competence and preventing conduct problems in low-income families of children enrolled in Head Start programs (Webster-Stratton, 1998; Webster-Stratton et al., 2001). This trial extends these efforts by examining intervention effects on parenting practices and child behavior in preschoolers at especially high risk for conduct problems. Because the sample was obtained through court involvement of an older sibling, the study was carried out with preschoolers not necessarily known to an educational or social service system. In fact, nearly half of these high-risk preschoolers were not in any type of educational or social program, even though most were eligible for preventive services based on income.

Consistent with findings from our previous study (Brotman et al., 2003), parents were satisfied with the multicomponent prevention approach that combined parent and children's groups with guided parent-child interactions, home visits, and additional supportive contacts. Most parents and preschoolers attended at least half of the groups and home visits. A preventive family-based program (Webster-Stratton, 1989) utilizing a collaborative approach (Webster-Stratton & Herbert, 1994), in combination with enhancements, was acceptable to families with multiple risk factors for conduct problems, including the presence of a delinquent adolescent.

The preventive intervention led to significant benefits on three of the four outcome areas that were hypothesized to change immediately following intervention. Relative to controls, parents in the intervention group were less negative in their parenting and provided greater stimulation for learning at home. In addition, preschoolers assigned to intervention displayed greater social competence with peers relative to controls. The findings related to negative parenting and child social competence extend the effects documented by Webster-Stratton, Reid, and Hammond (2001) to preschoolers at very high risk for conduct problems. The finding on stimulation for learning provides further evidence for the breadth of outcomes affected by this preventive approach. To our knowledge, no previous study of a family-based program aimed at preventing conduct problems has evaluated program effects on this important aspect of parenting.

Parents and children evidenced clinically meaningful benefits from the program in terms of negative parenting, stimulation for learning, and social competence despite a range of specific risk factors. For example, parents reduced negative parenting despite relatively high rates of parental antisocial behavior (22% had current antisocial personality disorder or a history of conduct disorder; Brotman et al., 2004). Parents in the intervention condition maintained stable levels of stimulation relative to controls who deteriorated over time notwithstanding low levels of educational attainment and cognitive functioning (Brotman et al., 2004). Finally, the intervention led to enhanced social competence in intervention children relative to controls even though they had, on average, limited cognitive functioning, high rates of developmental problems (e.g., speech and language difficulties), and a lack of exposure to structured peer group settings (Brotman et al., 2004).

As noted previously, parenting characterized by coercive interactions, harsh discipline, and criticism is a robust predictor of later conduct problems. Mediation analyses within the context of prevention trials have demonstrated the link between reductions in negative parenting and the prevention of later conduct problems in at-risk children (Martinez & Forgatch, 2001; M. Reid et al., 2004). The reductions in negative parenting (based on independent observations as well as parent report) obtained in this study, in combination with intervention effects on stimulation and child social competence, provide strong support for the potential of this intervention to yield long-term preventive effects on conduct problems.

In contrast to the significant effects for negative parenting, stimulation, and social competence, there was no intervention effect on positive parenting. This finding is consistent with other studies. For example, two randomized clinical trials of parent training for children with disruptive disorders reported significant

beneficial effects on negative parenting but no treatment effects on positive parenting (Hechtman et al., 2004; Wells et al., 2000). It is possible that a lack of immediate program effects on positive parenting will detract from expected long-term preventive effects on conduct problems. However, the evidence for a greater role for negative than positive parenting in the development of conduct problems (Loeber & Dishion, 1983; Patterson, Reid, & Dishion, 1992; Wasserman et al., 1996) argues against this possibility.

As expected, there was no discernable intervention effect on disruptive behavior immediately following intervention. Although Webster-Stratton (1998) and Webster-Stratton et al. (2001) have documented intervention effects on disruptive behavior at home in at-risk preschoolers immediately following intervention, these results were accounted for by reductions in the subsample of children who entered the trial with elevated behavior problems. In these two large trials with children attending Head Start, the pattern of change was for intervention children to decrease their deviant and noncompliant behaviors, whereas controls remained stable over time. Given this pattern of findings and the low levels of behavior problems in this study sample at baseline, we had predicted that no intervention effects would be observed immediately postintervention. We expect that intervention effects will be detectable at a later point in time when we anticipate that controls will exhibit increased behavior problems relative to children in the intervention condition.

A number of limitations should be noted. There was an Attrition \times Intervention Group interaction for positive parenting, with more positive parents in the control group dropping out and fewer positive parents in the intervention group retained. Although this difference most likely occurred by chance, it is possible that this hindered our ability to detect intervention effects on positive parenting. Second, observations of positive and negative parenting were limited to 10-min play interactions. It is possible that although this method of assessment was sufficient for detecting changes in negative parenting, longer periods of observation or observations of different types of interactions may be necessary to detect meaningful changes in positive parenting (Gardner, 2000). These limitations do not detract from the significant findings related to negative parenting, stimulation for learning, or child social competence but may have resulted in an underestimation of program effects on positive parenting. Finally, because all intervention parents received an enhanced version of the Incredible Years program, we cannot evaluate the specific utility of the parent groups independent of other components, including guided parent-child interactions, children's groups, home visits, or additional contacts.

Despite numerous risk factors, parents of adjudicated youths attended and were satisfied with the pro-

gram for their preschoolers, even though the majority did not exhibit problem behavior. Intervention parents benefitted in terms of negative parenting and stimulation for learning at home, and preschoolers evidenced important advances in social competence with peers. These findings suggest the utility of early prevention programs designed to enhance protective factors and reduce risk factors (e.g., stimulation for learning, child social competence with peers, harsh parenting) as a strategy for preventing conduct problems in children at high risk. Future studies with this sample will examine long-term effects on child mental health and academic outcomes, as well as intervention effects on preschoolers' neuroendocrine functioning and possible generalization effects to older nontargeted siblings.

Studies with larger samples of similarly high-risk children would permit analyses of moderators of outcome (e.g., race or ethnicity, behavior problems at baseline, parental depression) and mediational pathways (from parenting to child outcomes). Studies of intervention moderators and mediators could inform theory and further understanding of underlying processes related to the development of conduct problems in high-risk children and families. Future prevention efforts could identify younger siblings of antisocial youths in a variety of settings (e.g., schools, mental health clinics). Programmatic efforts to identify and address the needs of high-risk siblings appear feasible and warranted.

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