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The Difficulty of Maintaining Positive Intervention Effects: A Look at Disruptive Behavior, Deviant Peer Relations, and Social Skills During the Middle School Years

Conduct Problems Prevention Research Group

Abstract

This paper examines the effects of the Fast Track preventive intervention on youths' functioning in three domains: disruptive behavior problems, involvement with deviant peers, and social skills during the middle school years. Eight hundred ninety-one children had been randomly assigned by sets of schools within four sites to intervention ($n = 445$) or to control ($n = 446$) conditions. In contrast to prior findings of the effectiveness of the Fast Track intervention during the elementary school years, the current findings indicate that Fast Track had little overall impact on children's functioning in these domains during this age period. There were positive intervention effects on only 2 of 17 outcomes examined. Although the intervention had positive impact on children's hyperactive and self-reported delinquent behaviors in seventh grade, there were no intervention effects on other externalizing behavior problems or on social skills, and there was a negative intervention effect on children's involvement with deviant peers during this age period.

Keywords

prevention; conduct problems; middle school; school-based

In the arena of adolescent antisocial behavior, a distinction has been made between two different pathways leading to adolescent delinquency and conduct problems, based on age-related patterns of antisocial behavior. "Early starters" (also described as "life-course persistent"), as opposed to "late starters," begin their serious antisocial behavior early in childhood, as early as ages 6 to 8, and then continue with antisocial behavior into adulthood (Moffitt, 1993; Patterson, Reid, & Dishion, 1992). They are likely to engage in a versatile, wide-ranging set of antisocial behaviors, including both overt and covert delinquency (Loeber, 1990; Loeber et al., 1993). Furthermore, they exact an extraordinary cost to society. Cohen (1998) estimated that, in the United States, a single youth who follows the early starter pathway and who persists in a criminal career as an adult will cost society at least US \$1.3 million.

Because of their considerable influence on serious adolescent antisocial and criminal behavior, prevention programs are particularly needed to target youth with early starting

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conduct problems (Conduct Problems Prevention Research Group [CPPRG], 2004b). These prevention programs should begin early enough to alter the early stages of the developmental trajectory and to avoid escalating and more severe behavioral problems over time. As the child's behavior worsens, the child becomes enmeshed in accumulating risk factors, such as peer rejection and academic failure, clearly complicating the ease and effectiveness of intervention. These risk factors can then become the targets for well-conceived prevention programs. In the present paper, analyses will address whether children in one such prevention program, Fast Track, had better functioning in the domains of disruptive behavior problems, involvement with deviant peers, and social skills during the middle school years than did children in the control condition.

It is well established that the middle school period is one of increased risk for amplification and diversification of conduct problem behavior for youth who are on an early starter trajectory. Contextually, youth move from self-contained, single-teacher elementary classrooms to large, fluid middle or junior high schools (Eccles & Midgley, 1990; Eccles, Midgley, & Adler, 1984), which leads to reductions in parent and teacher support and monitoring. Consequently, youth spend more time with and are more influenced by their peers. Other factors such as neighborhood disadvantage and the presence of predatory street gangs also contribute to the development of deviant peer associations (Dodge, Dishion, & Lansford, 2006), in addition to school transition. Other changes that co-occur during this time period, such as the emergence of puberty, also contribute to the escalation in problem behavior, independent of the changes in the structure of school.

Alienation from conventional sources of social support from parents, teachers, and nondeviant peers can lead high-risk youth to join with other adolescents like themselves (e.g., Cairns, Cairns, Neckerman, Gest, & Garipey, 1988). Adolescents who associate with deviant peers have a substantially increased risk for escalation of serious offending (Vitaro, Tremblay, Kerr, Pagani-Kurz, & Bukowski, 1997), school dropout, and early substance use (Cairns, Cairns, & Neckerman, 1989; Chassin, Curran, Hussong, & Colder, 1996). Whereas girls are at considerably lower risk than boys for overt aggression during elementary school, their risk for becoming involved in early sexual activity, substance use, and covert antisocial activity rises in adolescence, due largely to associations with older antisocial boys (Caspi, Lynam, Moffitt, & Silva, 1993). Thus involvement with deviant peers is an important mediator of antisocial outcomes during adolescence; as such, it is an important focus of intervention in its own right.

This developmental model indicates that the dysfunctional development that is associated with the early starting pattern of conduct problems is multiply determined and is embedded in transactions among family, peer, school, and neighborhood influences and child characteristics (CPPRG, 1992, 2004b; Lochman, 2004; Scaramella, Conger, Spoth, & Simons, 2002). Hence prevention efforts must target both the promotion of individual competencies and the promotion of protective contextual supports. Preventive interventions must also be attentive to age-related stressors and successive changes in risk and protective factors across important developmental periods (Cicchetti, 1984). Data from the Rochester study (Thornberry, Huizinga, & Loeber, 1995) suggest that protective factors (e.g., social competence) must be continuously present during the transition from early to late adolescence and not simply in place at a single point in childhood or adolescence.

In addition, developmental research suggests that new risk factors emerge during adolescence that are associated with the escalation of antisocial and related adolescent behavior problems. Elementary school prevention may improve child "readiness" to tackle the new challenges of adolescence. However, for high-risk children living in unstable and risky contexts without effective protective supports, the challenges of adolescence may also

undermine the gains produced by early preventive efforts. Thus a successful program for preventing serious antisocial problems requires a long-term intervention commitment.

The most effective preventive interventions for children with conduct problem behaviors typically have multiple components that address parent and youth processes to reduce the likelihood of later problems (Eyberg, Nelson, & Boggs, 2008; Lochman & Wells, 2004; Pepler, King, Craig, Byrd, & Bream, 1995; Vitaro, Brendgen, Pagani, Tremblay, & McDuff, 1999; Walker, Stiller, Severson, Feil, & Golly, 1998). Despite the findings that these multicomponent programs can have positive effects on the conduct problems of children in general, none of these programs focused their implementation specifically on children who showed the highest levels of aggressive and conduct problem behavior at home and school and thus were at greatest risk for life-course persistent antisocial behavior.

The Fast Track prevention program is a multicomponent intervention program conducted across multiple sites, and targets those children at the highest risk for life-course persistent conduct problems (CPPRG, 1992). The multiple-gate screening procedure that was employed in kindergarten has been effective at identifying children at risk for sustained trajectories of conduct problems, although rates of false positives increase to nearly 50% by the fourth and fifth grades (Hill, Lochman, Coie, Greenberg, & CPPRG, 2004; Lochman & CPPRG, 1995). The Fast Track preventive intervention design targeted the primary risk factors for antisocial behavior, including poor parenting practices, deficient social problem-solving and emotional coping skills, poor peer relations, weak academic skills, disruptive classroom environments, and poor home-school relations. Thus, the Fast Track components addressed social and classroom risk factors (Bierman, Greenberg, & CPPRG, 1996) as well as family risk factors, including problematic communication between parents and school (McMahon, Slough, & CPPRG, 1996). Intervention began in first grade and continued into middle and high school (i.e., through 10th grade).

The initial analyses of the Fast Track Program indicated that the program had a significant impact on some of the proximal outcomes that were assessed in the elementary school phase of the project, such as improvements in behavior and social skills. At the end of the first grade, in comparison to the high-risk control children, high-risk intervention children displayed significantly greater reductions in behavior problems (not following directions, poor behavioral control, by parent and teacher report) and significantly lower rates of aggressive, oppositional behaviors at school (by teacher report; CPPRG, 1999a). In addition, the intervention children showed better adaptation, with greater word attack skills and higher language arts grades, lower rates of special education service use (according to school record review), more positive peer interactions (by observer ratings), higher social preference (by sociometric nominations), and improved social-cognitive and emotion skills (assessed by child interviews). Overall, significant intervention effects were found on 12 of 25 child outcome variables, and 6 of 15 parent outcome variables. In addition, improvements in general classroom behavior and classroom functioning indicated important universal preventive effects for all students (CPPRG, 1999b).

Analyses of program outcomes through the end of elementary school provided evidence, with small effect sizes (.14–.27), for the continuing positive outcomes from Fast Track. By the end of Grade 3, intervention children were continuing to display lower levels of conduct problem behavior in comparison to control children, as indexed by lower teacher and parent ratings of conduct problems (CPPRG, 2002a). Significant intervention effects were evident on five of the eight variables assessing child conduct problems, but only on two of the seven social and academic outcome variables. In a person-centered analysis completed at the end of Grade 3, children were identified as “clinical cases” on the basis of parent- and teacher-report measures of children’s psychopathology and behavior problems and teacher reports

and school record reviews of special education status. Children assigned to the Fast Track preventive intervention were significantly more likely to be “case-free” than were children in the control group (37% vs. 27%, respectively).

In analyses of children’s outcomes in the fourth and fifth grades, Fast Track had significant but modest influence on children’s rates of social competence and social cognition problems, problems with deviant peers, and conduct problems in the home and community, compared to control children (CPPRG, 2004a). Intervention effects on children’s functioning in school were no longer significant during this time period.

In general, we have not found that the intervention effects varied across subgroups of children during the elementary school period. Potential moderator variables examined include demographic variables (e.g., gender, race, site, and cohort), child variables (e.g., IQ), family variables (e.g., marital status, socioeconomic status, parent mental health, or substance abuse status), and neighborhood variables (e.g., poverty, instability, quality). The few scattered intervention interactions found across the elementary school analyses did not form any meaningful pattern and did not extend beyond chance levels.

However, we have recently examined psychiatric diagnosis outcomes and have found emerging moderation of intervention effects for this subset of variables on the basis of the severity of the child’s initial risk score (CPPRG, 2007). This is the screening score that was obtained on the basis of both teacher and parent report during the kindergarten year. Significant interaction effects between intervention and initial risk level were found after Grades 3 and 6, but most strongly after Grade 9. Among the highest-risk group (top 3%) in Grade 9, 75% fewer cases of conduct disorder, 53% fewer cases of ADHD, and 43% fewer cases of any externalizing disorder developed within the intervention group compared to the control group. In contrast, the intervention had no impact on children who were initially at only moderate levels of risk. Similar findings were obtained with an antisocial behavior score, based on the youth’s self-reported delinquency (although there was also a main effect of intervention). Youth in the highest-risk portion of the sample who participated in the Fast Track intervention reported significantly lower engagement in this measure of index crimes, interpersonal violence, and general delinquency than youth in the control group at similar levels of risk.

Purpose of This Study

This study represents an extension of the series of analyses described above that have investigated the efficacy of the Fast Track intervention. In this study, we examined the impact of the Fast Track intervention during the middle school years (Grades 6–8) on children’s problematic functioning in three domains: disruptive behavior problems, involvement with deviant peers, and social skills. These three domains are regarded as key outcomes for the Fast Track intervention, and this paper follows these outcomes from the last assessment of their status at the end of elementary school (CPPRG, 2004a) into the middle school years. Other papers have reported (psychiatric diagnoses and self-reported delinquency: CPPRG, 2007) or will report on other domains of youths functioning across the range of years from elementary through high school (academic outcomes, substance use, parent functioning) in the Fast Track study. The present study examines the cross section of outcomes just within the middle school years. Because of variations in analytic strategies required by different types of variables examined over different periods of time and different types of research questions, we have separated out the analyses for each of these areas. For example, because psychiatric diagnoses were assessed every 3 years in Fast Track, the paper on psychiatric diagnoses examined those outcomes from elementary school to the beginning of high school.

In the current paper, analyses addressed whether children in the Fast Track intervention had higher functioning in the three identified domains than did children in the control condition. In addition, because of our recent findings that indicated that Fast Track was having an influence on certain diagnostic outcomes primarily among the highest-risk children, we examined whether children's initial screen scores interacted with intervention.

Method

Participants

Schools within the four sites (Durham, NC; Nashville, TN; Seattle, WA; and rural central PA) were selected as high risk based on neighborhood crime and poverty. Within each site, schools were divided into multiple paired sets matched for demographics (size, percentage free or reduced lunch, ethnic composition), and one of each pair was randomly assigned to intervention and control conditions. Using a multiple-gating screening procedure that combined teacher and parent ratings of disruptive behavior (Lochman & CPPRG, 1995), all 9,594 kindergarteners across three cohorts (1991–1993) in 54 schools were screened initially for classroom conduct problems by teachers, using the Teacher Observation of Child Adjustment-Revised (TOCA-R) Authority Acceptance Score (Werthamer-Larsson, Kellam, & Wheeler, 1991). Children scoring in the top 40% within cohort and site were then solicited for the next stage of screening for home behavior problems by the parents, using items from the Child Behavior Checklist (CBCL; Achenbach, 1991a) and similar scales, and 91% of the parents agreed ($n = 3,274$). The teacher and parent screening scores were standardized and then summed to yield a total *severity-of-risk screen score*. Children were selected for inclusion into the study based on this screen score, moving from the highest score downward until desired sample sizes were reached within sites, cohorts, and conditions. Deviations were made when a child failed to matriculate in the first grade at a core school ($n = 59$) or refused to participate ($n = 75$), or to accommodate a rule that no child would be the only girl in an intervention group. A total of 95% of the selected sample scored in the top 20% on both the parent and teacher screening measures. The outcome was that 891 children (n 's = 445 for intervention and 446 for control) participated. Note that these levels of problems are defined relative to other children in these high-risk schools. On the kindergarten Teacher's Report Form of the Child Behavior Checklist (TRF; Achenbach, 1991b), the nationally normed ($X = 50$, $SD = 10$) average Externalizing T -score (available for 88% of the high-risk sample) was 66.4, and 76% of these children scored in the clinical range (T -scores of 60 or higher).

The mean age of participants was 6.5 years ($SD = 0.48$) at the time of identification. Across all sites, the sample was primarily comprised of African American and White participants (51% African American, 47% European American, and 2% of other ethnicity; e.g., Pacific Islander and Hispanic) and gender mixed (69% boys). The sample was skewed toward socioeconomic disadvantage: 58% from single-parent families, 29% of parents were high school dropouts, and 40% of the families were in the lowest socioeconomic class (representing unskilled workers) as scored by Hollingshead (1975). Only 32% of the sample were within the middle class range (Hollingshead categories 2 and 3), in comparison to rates of up to 75% in these two categories in some community samples (e.g. Reinherz, Tanner, Berger, Beardslee, & Fitzmaurice, 2006).

Written consent from parents and oral assent from children were obtained. Parents were paid for completing interviews, and intervention-group parents were paid for group attendance. All procedures were approved by the Institutional Review Boards of participating universities.

To improve the precision of the estimates of intervention effects, guard against any departures from randomization, and protect against differential attrition, 19 variables were measured prior to the initiation of intervention and were included as covariates in outcome analyses. These variables measured children's baseline behavior problems, family demographics and social ecology, children's cognitive and social skills, and parenting. Instruments and items are described at www.fasttrackproject.org. Table 1 reports data on intervention and control groups for the 19 baseline variables, with the intervention group having significantly higher parent-rated social competence, higher reading readiness on the Woodcock-Johnson, and lower physical punishment in comparison to the control group. Additional tests compared intervention and control groups within subgroups at highest and moderate risk and did not yield a systematic bias between the intervention and control groups. Although some differences did exist at the overall group level, the intervention and control groups were comparable on most of the baseline variables.

Attrition averaged 2% per year: 11% of intervention children and 16% of control children did not participate in the follow-up interview by Grade 8. Among those who provided data at follow-up, *t* tests were conducted to determine whether the intervention and control groups differed for any of the 19 baseline variables. Only 1 of 19 tests was significant, a pattern that is expected by chance. We also examined whether attriters were different from retainers on these variables. There were significant interaction effects between attrition status and intervention status on 2 of the 19 variables. Attrited intervention children had higher baseline levels of reading skills and had received less physical punishment than did retained intervention children; the opposite pattern was evident for control children. It was concluded that attrition did not lead to substantial differences in preintervention characteristics of intervention and control groups.

Intervention Procedures

Elementary school phase (Grades 1–5)—Great effort was expended to offer a coherent array of services across 10 years to each family in the intervention condition, starting with the beginning of elementary school. During the elementary school phase of the intervention (Grades 1–5), all families were offered child social skills training, academic tutoring, and parent training with home visiting. Parent and child group interventions were conducted during a 2-hour “enrichment program.” During the first 60 to 90 minutes of this enrichment program, high-risk target children met in groups of 5 or 6 in “friendship groups” led by Educational Coordinators (Bierman et al., 1996) while parents met in a group led by Family Coordinators to discuss parenting strategies that would support child school adjustment and improve child behavior (McMahon et al., 1996). In the next 30 minutes, parent-child pairs participated in positive cooperative activities and practiced positive parenting skills with staff support, called Parent-Child Sharing Time. In first grade, paraprofessional tutors also provided 30 minutes of reading tutoring during the enrichment program. In addition, the tutors provided two more reading tutoring sessions each week, along with a weekly peer-pairing session to improve friendships with classmates, to all intervention children in Grade 1.

The enrichment programs were held weekly during Grade 1 for 22 sessions, biweekly during Grade 2 for 14 sessions, and monthly during Grades 3–5 for 9 sessions each year. In addition, individual support was provided through home visiting (Dodge, 1993) to help parents generalize the skills presented in the group setting and to address individual needs. A middle school transition program began in fifth grade and continued into the beginning of middle school. In fifth grade this program included visits to the middle school and structured meetings with the middle school counselor.

Children and families were offered a standard level of services in Grade 1 to the extent that they could be delivered. In subsequent years, criterion-referenced assessments were used to adjust the dosage of some components (tutoring, home visiting, and peer coaching) to match family and child need.

In addition to indicated interventions, a universal intervention was provided to the classrooms in intervention schools through the elementary school years. This curriculum, an adaptation of the PATHS curriculum (Kusche & Greenberg, 1993), was designed to promote social and emotional competence and a more competent and less aggressive social ecology. Teachers implemented this classroom-level program throughout Grades 1–5, teaching an average of 2–3 lessons per week. The universal intervention included weekly teacher consultation for lessons and classroom behavior management.

Middle school phase (Grades 6–8)—There were three standard prevention activities offered to all Fast Track intervention children during middle school: the middle school transition program, parent and youth groups on adolescent topics, and youth forums. The middle school transition program continued at the beginning of the sixth grade year, and included child sessions consisting of coaching in organizational and study skills, meetings with middle school student mentors, and parent sessions with a focus on developing positive parent relationships with counselors and teachers.

Adolescent developmental issues were addressed with four meetings for parents and youth during the sixth grade year. During each of these 2-hour meetings, parents and youth met separately for part of the time, and then together for the remainder. Parent groups focused on positive involvement and monitoring, communication and conflict management, and support for academic achievement. Youth groups focused on coping with peer pressure; resistance and refusal skills; and advanced problem-solving, goal-setting, and decision-making skills. Parents and youth met together in groups to address romantic relationships and sex education; use of alcohol, tobacco and drugs; and vocational goal setting.

In Grades 7 and 8, eight Youth Forums were held with youth in small groups to address vocational opportunities, budgeting and life skills, job interview skills, and summer employment opportunities. These workshops were based on Oyserman's (2000) program on future selves emphasizing adolescent identity.

In Grades 7–8, individualized intervention plans were developed and implemented with each youth, based on triannual assessments of risk and protective factors. These individualized services continued into the high school years, through Grade 10. Ratings were made by project intervention staff of intervention children and their families every 4 months in four domains of functioning (parent monitoring and positive involvement, peer affiliation and peer influences, academic achievement and orientation, and social cognition and identity development). Based on these ratings, youth and families either received the base level of intervention contact (once per month), or additional contact in interventions related to the targeted domain (e.g., academic tutoring, mentoring, support for positive peer-group involvement, home visiting and family problem solving, and liaisons with school and community agencies) for up to several hours more per month. At each of the repeated assessments, approximately 15% of the youth were recommended for minimal services (rated to receive minimal services in all four domains of risk), and these rates were relatively consistent across the middle school years (recommendations for minimal services: 15% in Grade 6, 14% in Grade 7, 16% in Grade 8). Some individual children shifted between having minimal services and needing more across these years. Seventy-two percent of the Fast Track children were never recommended for minimal services at any assessment point in the middle school years, and only 2% were recommended for minimal services at each

middle school assessment point. The rates of recommendation for minimal services were not significantly correlated with the youths' initial screen scores ($r = -.05$).

Intervention fidelity—Intervention fidelity was promoted by manualization of all components, regular cross-site training and communication, periodic observation of sessions by the developers and supervisors, weekly staff training, and ongoing clinical supervision. Outside interventions were neither encouraged nor discouraged and were assumed to occur at the same rate for intervention and control groups. The control condition was a “treatment as usual” comparison that included regular school prevention programs to the extent that schools chose to use them.

Intervention participation—Participation was defined as attendance at one or more group sessions—96% of parents and 98% of children participated during Grade 1. Of these families, 79% of parents and 90% of children attended at least 50% of all sessions. In Grade 2, 88% of parents and 92% of children participated, with 79% of parents and 87% of children attending at least 50% of all sessions. In Grade 3, 80% of parents and 86% of children participated, with 78% of parents and 84% of children attending at least 50% of all sessions (CPPRG, 2002b). The proportion of families unable to participate in the intervention increased modestly across the years, primarily due to moves out of the area. In the last year of the group sessions (Grade 6), 43 of the 445 intervention families (10%) did not participate but had still received the majority of the services in previous years.

In Grades 7 and 8, intervention became more individualized and adaptive. Participation was calculated as attendance at one or more sessions across the seventh and eighth grades in the sets of individualized activities. Participation rates were: 63% in family meetings (mean of 3.8 meetings attended, $SD = 5.8$), 80% in parent meetings ($X = 15.5$ meetings attended, $SD = 16.3$), 78% in individual meetings with youth ($X = 23.6$ meetings attended, $SD = 24.5$), 73% in group meetings with youth ($X = 6.4$ meetings attended, $SD = 7.8$), 64% in academically related contacts involving tutoring and homework clubs ($X = 34.2$ meetings attended, $SD = 60.9$), and 31% in youth meetings with mentors ($X = 3.1$ meetings attended, $SD = 7.8$). School or agency contacts were made on behalf of 77% of the intervention youth ($X = 20.2$ contacts, $SD = 26.5$). In terms of the content of the meetings and contacts, 78% of the youth dealt with vocational and identity development issues ($X = 7.8$ meetings about this, $SD = 5.6$), and 78% dealt with positive peer engagement issues ($X = 8.1$ meetings about this, $SD = 5.8$).

Outcome Measures

There are a total of nine outcome constructs tapping three domains at three time points during middle school, as indicated below. Because not all of the nine outcome constructs were measured at each of the three time points, a total of 17 variables were examined in analyses. Outcome measures covering the following domains were collected only in certain years during middle school because a briefer battery was used in sixth grade when we collected structured psychodiagnostic data, and because some parent ratings were phased out by the eighth grade (e.g., parent CBCL and Parent Daily Report [PDR] for hyperactivity). Table 2 lists the measures and constructs that were measured in each of the middle school years.

Disruptive behavior problems—The nine variables assessing children's disruptive behavior problems (delinquent behaviors, externalizing behaviors, hyper-activity) during the middle school years are drawn from four measures provided by three sources (youth, parent, teacher). Items from Huizinga and Elliot's (1987) commonly used Self-Report of Delinquency (SRD) instrument were administered to youth in their homes after Grades 7

and 8. The youth reported the number of times within the past year that each of 34 problem behaviors was committed. This instrument yields a sum score called *index offenses* (SRD-IE) that includes 13 items such as “stolen an item greater than a hundred dollars in value,” “sold heroin or LSD,” “attacked someone with intent to hurt,” and “had sex with someone against their will.” The internal consistency of this index offenses scale is adequate ($\alpha = .77$ in Grade 7 and in Grade 8) with the sample in this study. Scores ranged from 0–13, but 94% of scores in the normative sample were below 1.

The *CBCL Externalizing Behavior Problems* scale is a broadband factor score from the parent reports on the CBCL (Achenbach, 1991a). The 33-item variable was assessed in the summer after seventh grade. The Externalizing Behavior Problems score has high internal consistency ($\alpha = .93$ in our sample in seventh grade).

A *TRF Externalizing Behavior Problems* score is derived from the TRF (Achenbach, 1991b). This broadband score has 34 items, and has high internal consistency ($\alpha = .96$ in sixth, seventh, and eighth grades in our sample). The TRF was completed by teachers near the end of the sixth, seventh, and eighth grade years. The Externalizing Behavior Problems scale was generally completed by one teacher. In 4% to 11% of the cases across years, data was collected from a second or third teacher as well. In the cases with multiple teachers, the teacher rating items were averaged for each participant. Alpha coefficients were calculated on the mean scores.

Parents’ ratings on the 11 oppositional-aggressive behavior items of the PDR (Chamberlain & Reid, 1987; $\alpha = .85$ in seventh grade and $.71$ in eighth grade in our sample) were collected on three separate days (once in person, followed by two phone calls) and averaged to provide an assessment of child *aggressive* and oppositional behavior at home. The PDR aggression scale was collected after the seventh and eighth grades. Children’s *hyperactivity* was also assessed on the PDR after the seventh grade year. The hyperactivity scale had three items, and had internal consistency of $.52$ in our sample. These two scales on the PDR were determined through prior factor analyses (Rain, 2002).

Peer deviance—Peer involvement in deviant behaviors was measured by adapted versions of the Self-Report of Close Friends (O’Donnell, Hawkins, & Abbott, 1995). In seventh grade, children’s reports of the *friends’ bad behavior* were assessed with children’s reports of five items describing their best friend ($\alpha = .82$ in seventh grade in our sample; items assess getting in trouble with teachers, gotten in trouble with police, and trying alcohol, cigarettes, and marijuana/drugs). In eighth grade, children’s reports of *friends’ deviant activity* were assessed with 11 items ($\alpha = .88$ in our sample). The variable included the same 5 items as used in the seventh grade, but had been revised in eighth grade to add items that measure delinquent behaviors that become more prevalent in the adolescent years (stealing, drug selling, damaging property).

Social skills—Children’s social skills were assessed with teacher reports using the Teacher Ratings of Student Adjustment (TRSA). This measure was completed by teachers at the end of the sixth, seventh, and eighth grade years. The TRSA scale was usually completed by more than one teacher. Up to five teachers completed the TRSA scale on each child, and the percentage of children who received TRSA ratings from multiple teachers ranged from 60% to 85% within each of these years (sixth, seventh, and eighth grades). In the cases with multiple teachers, the teacher ratings were averaged. This measure was developed for this project and included single-item ratings for *social skills* (“Social Skills: The student’s ability to develop friendships, get along with peers, and be part of a social network or group of friends.”) and for *relationships with adults* (“Adult Relationships: The student’s ability to relate well to teachers and adult staff and to build positive relationships

with adults.”). Each item was typically rated by multiple middle school teachers for each student, using a 5-item response format, going from 1 (*poor*) to 5 (*excellent*). The intraclass correlation coefficients were .31 for social skills and .36 for relationships with adults. The interrater reliability of this measure is low in part due to the variations in children’s behavior across classroom contexts. The multiple teachers’ scores were aggregated for a single mean score for each child. However, these two variables have demonstrated some validity, as they significantly differ between the normative and high-risk control sample (Muschkin, 2003).

Statistical Model and Treatment of Missing Data

An intent-to-treat design including all participants was used to assess intervention effects. As with any longitudinal study, missing data were present with the rates for individual variables in the model ranging from 0% to 33%. To ameliorate the effect of sporadic missing data, multiple imputation techniques were employed using PROC MI (SAS v9.1). Twenty imputed data sets were created that included all of the outcome variables, gender, race, site, cohort, 19 preintervention covariates, and initial severity-of-risk score. Previous analyses showed initial school assignment explained virtually no variance by middle school years, but to partially account for this possibility, the percentage of minorities and the percentage of children receiving lunch aid at the first school attended were also included in the analyses. Some of the outcome variables showed nonlinear relationships with initial screen score, so a polynomial term was included in the imputations to allow for this. All of the above were later used in the analyses.

Because imputation from a covariance matrix, as PROC MI uses, preserves only the estimated variances and covariances when generating imputed datasets, other effects, such as interactions between intervention status and other variables in the model, tend to be artificially weakened. As a result, imputation was performed separately for the intervention and control conditions and this process also allowed the covariances among other variables to differ by intervention.

The responses of interest in the 20 imputed complete data sets had floor or ceiling effects and were analyzed with Tobit regression analyses for reasons described below. However, because of this, imputed values of responses that were out of the natural range of a response were rounded to the cutoff value. After the 20 imputed data sets were analyzed separately, the coefficients were combined following Rubin’s rule (Rubin, 1987) with the PROC MIANALYZE procedure in SAS. After imputation, all predictors were either centered or dummy coded (e.g., intervention status, gender, race).

Tobit models used in this study refer to regression models in which the range of the dependent variable is constrained or limited in some way (Greene, 1997). Osgood, Finken, and McMorris (2002) have found Tobit regression analyses are particularly useful for censored normal distributions of data such as delinquency data where there can be many cases who have not committed delinquent acts and who thus have zero values on the delinquency variable. The analysis of a dependent variable with a large number of zero values using ordinary least squares regression (OLS) may lead to biased parameter estimates (Greene, 1997; Long, 1997). An approach sometimes taken by researchers to handle these skewed data is to create dichotomous variables (delinquent vs. not delinquent) that are then analyzed with logistic regression. Unfortunately, this approach results in loss of information because detailed information on the extent of delinquent behavior, when the individual actually is delinquent, is collapsed into a *yes-no* variable. The use of Tobit regression analyses allows for appropriate analysis of dependent variables with large numbers of zero values without having to lose information by dummy coding these data (Delva, Grogan-Kaylor, Steinhoff, Shin, & Seifert, 2007). In Tobit models, scores above zero are real and continuous values. Censored zero scores remain in the sample for analysis, but the specific

values are treated as unknown, and are a latent dimension (Long, 1997). Because Tobit analyses are sensitive to departures from normality in the continuous portion of their distributions, transformations were used to create more normal distributions when substantial skewness was present for some variables. Variables are not transformed when the continuous portion of their distribution was normally distributed, but transformations (cube root, square root) were required if the continuous portion of the distribution was not normally distributed (see Table 3).

Because multiple imputation techniques were used, it was not clear that model selection tools such as information criteria and likelihood ratio tests could be used to create parsimonious models. Therefore, a more traditional stepwise approach was used to remove nonsignificant terms. Each variable was first analyzed with a complex model that included (a) 19 initial status covariates; (b) main effects for site, cohort, gender, race, and all of their two-way and three-way interactions with the screen score; and (c) intervention status and the linear interaction of intervention with screen score, the screen score squared, and the interaction of intervention with screen score squared. Stepwise removal of nonsignificant terms went through four steps. First, when the three-way interactions involving site, cohort, gender, and race were nonsignificant, they were removed from the model. Second, nonsignificant two-way interactions with site cohort, gender, and race were removed, preserving hierarchical structure when necessary. Third, the polynomial (screen squared) terms were removed if both the screen squared term and its interaction with intervention were nonsignificant at the $p = .10$ level. Otherwise, both were retained in the model and reported. Fourth, the same was done with the linear screen term and its interaction with intervention. The initial status covariates and intervention status were always in the model. The main effects are summarized in Table 3.

Results

Disruptive Behavior Problems

There was a significant intervention effect for Grade 7 *index offenses* indicating that Fast Track youth had lower rates of self-reported delinquency (Cohen's d effect size: .14, in the small range). There were no significant main intervention effects on index offenses in Grade 8, and there were no interaction effects of key potential moderators (screen, gender, race, or site) with intervention in either grade.

The Grade 7 and 8 PDR *oppositional-aggressive* scores showed no significant screen interaction or main intervention effects. The intervention children tended to have higher levels of CBCL *externalizing behavior* problems in Grade 7 than did control children ($t = 1.79, p = .07$). As screen score increased, externalizing behaviors also increased as expected for all children. The polynomial screen score term (screen squared) is significant ($p < .01$) and the intervention interaction with the polynomial screen score term is a nonsignificant trend ($p < .06$, Cohen's d effect size: .12). There is a rapid increase in externalizing starting about the 98th normative percentile for control boys (at screen score of 3.2) and about the 82nd normative percentile (at screen score of 1.5) for control girls (the shapes of these interactions are illustrated in Figure 1). The significant ($p < .05$) Intervention $\times$ Gender $\times$ Screen score interaction indicates that intervention is only effective for girls who had high baseline screen scores. The interaction effect was probed by examining where the significant intervention-control group differences existed along the screen score normative percentiles. Above the 93rd normative percentile for girls, intervention led to reductions in externalizing scores of 7.99 points in comparison to control girls, representing a significant effect for 21% of the at-risk girls (58 of the girls with the highest screen scores out of the total of 276 screened at-risk girls) in the study ($t = -2.86, p < .01$, Cohen's d effect size: .14). There were no significant areas of effects for boys.

No significant intervention, intervention-by-screen, or intervention-by-other-moderators (gender, race, site) effects were present for teacher-reported *externalizing behavior in Grades 6 through 8*.

Hyperactivity had no screen effects, so all screen terms were removed from the model. Intervention significantly ($p < .05$) reduced Grade 7 hyperactive problem behaviors. It should be noted that this score had only modest internal consistency, perhaps due to the small number of items in the scale. The effect size was in the small range (Cohen's d effect size: .16). Intervention did not interact with moderator variables.

Peer Deviance

The best friends' *bad behavior* in Grade 7 was not significantly affected by intervention. In Grade 8, intervention children reported that they had best friends who were engaged in significantly more *deviant activity* than was the case for the control children ($t = 2.06$, $p < .05$, Cohen's d effect size: .10). This main effect is qualified by an Intervention $\times$ Screen interaction effect ($p = .01$), but the significant interaction is only due to one control child at the low end of the screen score. Because of this outlier, the interaction with screen score for this variable appears to be spurious.

Social Skills

In Grade 6, there are no intervention or intervention-by-moderator differences on teacher-reported *social skills* and *relationships with adults*.

In Grade 7, complicated interactions are present for social skills, possibly due to site differences in that year regarding middle school transitions. Approximately half of the children in Seattle and in Pennsylvania left elementary school after the sixth grade, while children at the other sites primarily left elementary school after the fifth grade. African American children given intervention in general scored higher on social skills than their control counterparts, regardless of screen score ($p < .001$). Site differences also existed that were independent of screen score ($p < .001$). Site by intervention interactions indicate that intervention participants at Pennsylvania had better social skills than the control participants, but the reverse was the case at the other three sites, with control youth having better social skill scores than intervention participants. However, the most striking result is the significant ($p < .01$, Cohen's d effect size: .17) Intervention $\times$ Gender $\times$ Screen interaction (Figure 2). Control and intervention boys are rated at the same level regardless of screen score, and there is no significant difference between them at any point on the screen score. The effect of initial screen score was more apparent for girls in general. Above the 96th normative percentile (representing 12% of the at-risk girls), significant differences existed between intervention and control girls ($t = 1.93$, $p = .05$). Control girls at the higher end of the screen score received noticeably lower social skills ratings from teachers. Conversely, intervention girls received noticeably higher social skills ratings as screen score increased. At the lower-risk level, below the 65th normative percentile (4% of the at-risk girls) on the screen score, differences again tended to emerge for intervention versus control girls ($t = 1.72$, $p = .08$). These slope differences result in apparently harmful effects for intervention girls in the lower ranges.

For teacher ratings of adult relationships, there were differences between intervention and control children as a function of the screen score. A polynomial curve ($p < .05$) was apparent for the control children in Grade 7; the effect of screen score was nearly flat below the sample mean but dropped rapidly above the sample mean. Although the polynomial shape for intervention children was not significant ($p < .15$), the linear interaction with screen was ($p < .05$, Cohen's d effect size: .19). The predicted values for control and intervention

subjects started to diverge at about the sample mean, resulting in larger differences between intervention and control children, with intervention children receiving better ratings at higher screen scores. Intervention versus control interactions at the different sites were significantly different but small in comparison to other interactions. In comparison to the control group, the intervention group at the Seattle site had lower adult relations scores than Durham and Nashville but higher than Pennsylvania.

Discussion

In contrast to prior findings of the efficacy of the Fast Track intervention during the elementary school years, these findings indicate that Fast Track had little overall impact on children's functioning in three key behavioral and social domains during the middle school years (Grades 6–8). Of the 17 variables tested in the three domains, intervention had a positive main effect in only two cases (SRD delinquent index offenses and PDR hyperactivity in Grade 7) and had negative effects on one variable (involvement with deviant peers in Grade 8).

Disruptive Behavior Problems

In terms of children's disruptive behavior problems, the Fast Track intervention did lead to relatively lower levels of hyperactivity behaviors (according to parent PDR ratings) and to self-reported delinquency, both in seventh grade, in comparison to control children. Because these were the only two main intervention effects that were significant out of this set of nine outcome variables in this domain of disruptive behavior problems, the effects must be interpreted cautiously. The PDR hyperactivity ratings were not completed in subsequent middle school years, so it is not clear whether this positive intervention effect was sustained in each year. Because of the linkage between hyperactivity and poor behavioral inhibition (Barkley, 1998), intervention children may be decreasing their overactive behaviors by becoming better at inhibiting their impulsive and prepotent responses. The intervention's focus on assisting parents to provide clearer consequences for problem behavior can help highest-risk children in acquiring more accurate and adaptive expectations of consequences following disruptive behaviors, and this may contribute to greater behavioral inhibition and reduced rates of overactive behaviors.

The intervention effect on PDR hyperactive behaviors was not accompanied by broad effects on PDR aggressive and other CBCL externalizing behavior problems during the middle school years although there was a significant intervention effect for youths' self-reported delinquent index offenses in Grade 7. Although Fast Track youth did have lower rates of self-reported delinquency in seventh grade, parallel to the intervention children's parent-reported improvements in hyperactive behaviors, these intervention effects on seventh grade delinquency were not apparent in the sixth grade (CPPRG, 2007) or in eighth grade. These findings suggest that Fast Track has had some effects on self-reported delinquency, perhaps associated with gains in inhibiting prepotent responses as evident in the hyperactivity finding, but the effects are not consistent and are variable over time. The intervention effect on self-reported delinquency is not accompanied by intervention effects on parent or teacher ratings of externalizing behaviors in middle school.

Involvement with Deviant Peers

An unexpected intervention effect that emerged in the middle school years was that in eighth grade the Fast Track intervention children were more likely, rather than less likely, to be involved with deviant best friends in comparison to control children. This negative intervention effect is in marked contrast to the findings at the end of elementary school, when Fast Track intervention children had significantly lower involvement with deviant

peers than control children (CPPRG, 2004a). It appears that when faced with the greater freedom and reduced supervision and the exposure to a broader array of peers that are evident in middle school, the Fast Track children sought out or were sought out by other children who engaged in antisocial behaviors. Even though at-risk children may have poor peer acceptance in elementary school, they retain a desire to affiliate with peers, and when they move to broader peer groups in middle school they can begin to aggregate with other at-risk children who are similarly poorly accepted by their peer group (Asher & Coie, 1990; Cairns et al., 1988). Once involved with a deviant best friend or a deviant peer group, a child becomes more likely to engage in antisocial behaviors (Vitaro et al., 1997) that are mutually reinforced by the deviant dyads and deviant groups (Dishion, Patterson, & Griesler, 1994). This higher level of involvement with deviant friends among Fast Track youth may have contributed to the reduced intervention effect on their aggressive and externalizing behavior during this early adolescent age period.

The question remains why the Fast Track intervention children would have a higher rate of involvement with deviant best friends. It is possible that intervention staff and mentors, who were actively reinforcing Fast Track youth for having increased interactions with peers, may have in some cases inadvertently reinforced children's active involvement with friends who, unknown to the staff, had antisocial behavior histories. It is also possible that the aggregation of Fast Track children into groups had accelerated their involvement into deviant peer groups, although the opposite effect was evident at the end of elementary school and there were few adolescent group activities during the middle school years. During adolescence, most of the intervention work with youth was conducted individually or in workshops in conjunction with their parents.

Social Skills

Similar to the prior findings, Fast Track children's significant advantages in social skills and social competence in the elementary school years (CPPRG, 1999a, 2002a, 2004a) in comparison to control children decayed during the middle school years. Intervention and control children overall had similar levels of social skills with peers and of relations with adults in school during the middle school years. Fast Track children's increased levels of involvement with deviant friends during this period may have contributed to deterioration in their general abilities to develop and maintain social interactions with the general population of students and adults at their schools. Of course, the reverse may also have operated, with decreasing social skills leading to greater rejection from conventional peers which in turn could have led to increased association with deviant peers.

Moderation of Intervention Effects by Children's Initial Severity Level

We previously reported that Fast Track effects on children's rates of conduct disorder, oppositional defiant disorder and ADHD symptoms and diagnoses (in third, sixth, and ninth grades), and on their self-reported delinquent behaviors (in ninth grade) were most evident for children who had the most severe levels of problem behavior at the time of initial screening into the program (CPPRG, 2007). Our current analyses indicate that the ability of children's initial screen scores to serve as moderators of children's behavioral and social functioning during the middle school years was not clear. Although the screen score did moderate several of the intervention effects during middle school, this was interpretable on only 2 of the 17 outcome variables, and then only for girls. The general conclusion is that the children's initial risk score is not moderating middle school intervention effects, except for the limited findings with girls.

In seventh grade, Fast Track girls who had higher initial screen scores did have lower levels of externalizing problems and higher levels of social skills than similar control group girls.

As expected, control girls at higher levels of screen scores did display higher levels of externalizing behaviors in seventh grade. The 21% of Fast Track intervention girls with the highest screen scores were able to avoid the elevation in externalizing problems evident in control girls at similar levels of initial risk. Similarly, 12% of the Fast Track girls who had the highest levels of initial screen scores demonstrated greater acquisition of social skills than for similar girls in the control group. Similar to the externalizing behavior finding, the highest-risk control girls had particularly weak social skills in seventh grade, and the Fast Track intervention may have ameliorated that risk for similar high-risk girls. This effect for highest-risk girls was not due to these girls receiving more intervention services in the adaptive intervention design in the middle school years. Overall, there is not a consistent pattern for more positive effects during the middle school years for children at the highest level of initial severity.

Limitations

Several limitations are evident in this assessment of intervention effects in the middle school years. Because of efforts to adjust the developmental appropriateness of assessment batteries, and to avoid response burden, not all measures were administered throughout the middle school years, and some measures changed in their item structure. Limited internal consistency was also evident on one of the two measures with positive intervention effects, the parents' rating of hyperactivity, perhaps due to the small number of items on this scale. We also had limited assessment of some of the domains examined in this study, including a lack of direct observational measures of behavior. However, the behavioral and peer deviance measures used here included ones on which we had obtained positive intervention effects at the end of elementary school.

The assessment of children's social skills was much less detailed and comprehensive than in earlier years when we had an array of developmentally appropriate measures of children's social relations and social competence. In the middle school years, we relied only on teacher ratings of social skills, and because teachers are with children for only limited periods of time in middle school, they are unlikely to be able to provide a comprehensive assessment of youths' social skills. The interrater reliability from multiple teachers in different classrooms was low, limiting confidence in these measures. Despite this limitation, our normative and high-risk control children differed significantly on the social skill variables, indicating some support for the validity of the measure.

This study used youth self-reports of their peers' deviant behaviors, and prior research has noted the limitation of this form of measurement of peer deviance (Mrug, Hoza, & Bukoski, 2003). Despite the fact that prior research has found similar patterns of deviant peer influence regardless of whether youth report on their friends' behavior or the friends report on their own behavior (Fergusson, Wanner, Vitaro, Horwood, & Swain-Campbell, 2003), adolescents' reports on friends behavior can be distorted, and can lead to inflated estimates of peers' influence (Berndt & Keefe, 1995). Future research could rely on peer-based methods such as averaged reports from nominated friends (e.g., Fergusson et al., 2003) or network analyses (Cairns, Xie, & Leung, 1998).

The sample did not appear to be large enough to assess the small intervention effects during this age period. This problem with sample size emerges over time with this study, and with other studies with targeted risk samples because the risk screening variables are not perfectly accurate. By the end of the elementary school period, our accuracy of predicting from our baseline screen score to externalizing outcomes had become less precise (Hill et al., 2004). The difficulty in predicting to outcomes is particularly apparent when the outcomes have relatively low base rates. As a result, the effective or useful sample available to test intervention effects is only a portion of the actual sample.

The lack of information about what other interventions and services were being offered within the intervention and control schools is a limitation, as schools may have responded to their intervention or control status by offering more or fewer services.

This study examined the domains on which the Fast Track intervention had made a positive impact in earlier years (CPPRG, 2004a). Although these three domains are central to the developmental model for Fast Track (CPPRG, 1992), other outcomes will also be assessed in other analyses. These other outcomes include children's academic functioning (CPPRG, 2009), their substance use, and parenting practices across the late elementary school to high school period. These outcomes are not included here because the analyses will cover trajectories across a wider age range from elementary school to high school, in contrast to the narrower focus here on the middle school years. For example, because children's substance use was still occurring at relatively low rates during this period, future analyses will examine growth of substance use extending into the high school years. Research is also examining the arrest and court conviction history of intervention and control children using court records collected through the end of high school (CPPRG, 2009).

Summary of Fast Track in the Middle School Years

In general, these findings indicate that the earlier promising findings for the effectiveness of Fast Track in the elementary school years (CPPRG, 1999a, 2002a, 2004a) were not generally maintained in the middle school years in the domains of disruptive behaviors, deviant peer involvement, and social skills except for positive intervention effects on hyperactive behaviors and on self-reported delinquency in seventh grade. This unexpected and disappointing pattern of findings may be the result of a variety of factors, such as changes that are taking place in how risk factors are related to proximal outcomes during this developmental period, increasing difficulty in successfully engaging youths' readiness to change during this developmental period, or inherent weakness in the intervention during this age period.

With regard to risk factors, the intervention during this period was designed to address factors that have been found to predict adolescent antisocial behavior, but the risk factors' effects may rapidly change during this developmental period and the intervention may not be addressing the nature of those risk variable changes. For example, the nature of the deviant peer risk may operate in qualitatively different ways in the first year of middle school when children are suddenly exposed to a wide variety of new peers than at other times when the peer context is more stable. An alternate view could suggest that the risk factors identified are accurate, but that they are markers of risk rather than being the active mechanisms of increased risk themselves.

With regard to children's engagement in the intervention, the volatile changes in children's social interactions and academic engagement during the middle school years can interfere with the intervention's impact on children by making the youth less responsive to the social reinforcement of intervention staff and less ready and motivated to follow adult staffs' plans for social and behavioral change. In addition, in our efforts to encourage active peer involvement, we may have been insufficiently attentive to the deviance of the new peers with whom Fast Track children were becoming involved.

The intervention itself may have not been adequately developed to address the identified risk factors. The nature of the Fast Track intervention changed during the middle school years. Fast Track had its most intensive array of services for children and families at the entry into elementary school, in first and second grades. The frequency of contacts between intervention staff and children was reduced in subsequent years. Adaptive intervention procedures were in place in the middle school years, in which intervention staff assessed

children and families three times per year on their levels of risk factors in different domains, and more frequent services were prescribed for those cases with higher risk. But even at higher levels of risk, the amount of contact between intervention staff and children and families was not at the level of contact evident in first grade. Thus an important question is whether Fast Track provided a sufficient level of intensity of services during the middle school years to meet the emerging and increasing social and behavioral risks that youth were experiencing. Perhaps children had relied on the scaffolding inherent in Fast Track intervention services and support in the earlier years, and in the absence of those earlier higher levels of support, they were less resilient in their ability to handle some of the challenges inherent in the middle school years. Thus in the presence of an intervention that may have not been intensive enough during the middle school years, the changes evident in the Fast Track children's behavior in elementary school may have been inadequate to produce maintenance of improved behaviors during adolescence.

Given the clearer effect of Fast Track on high risk youths' conduct problem behavior in ninth grade (CPPRG, 2007), it will fall to future research to determine whether consistent Fast Track intervention effects reemerge during the high school years. Prior research has found that early preventive intervention can have "sleepers effects" in reducing adolescent antisocial behavior (Vitaro, Brendgen, & Tremblay, 2001). Research with the Seattle Social Development Project intervention has found that preventive intervention delivered during the first six grades did not produce improvement in school bonding during the middle school years, but school bonding did significantly improve in the high school years for intervention youth (Hawkins, Guo, Hill, Battin-Pearson, & Abbott, 2001). Hawkins et al. concluded that long-term effects of preventive interventions on these and other outcomes were important to assess even when short-term effects were small or seem to disappear. The same process may occur within the Fast Track sample.

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Figure 1.
Participants' Seventh Grade CBCL Externalizing: Intervention $\times$ Gender $\times$ Initial Screen Score Effects

Figure 2. Participants' Seventh Grade Social Skills: Intervention $\times$ Gender $\times$ Initial Screen Score Effects

Table 1

Preintervention Means, Standard Deviations, and Differences Across Conditions

Variable	Range	Intervention		Control		df	t	p
		$\bar{X}$	SD	$\bar{X}$	SD			
Baseline child behavior problems								
Parent daily report of oppositional + Aggressive behaviors	0–8	0.26	0.17	0.27	0.17	886	0.84	.40
TOCA-R Authority acceptance behavior mean scale score	0–5	2.18	0.95	2.24	0.96	883	0.93	.35
Family demographics and social ecology								
Hollingshead socioeconomic status	4–66	24.58	12.91	24.17	12.46	886	–0.48	.63
CES-D maternal depression scale	0–57	15.83	9.84	16.81	10.42	888	1.43	.15
Mother-rated family satisfaction	0–3	2.11	0.76	2.18	0.68	882	1.5	.13
Mother-rated friendship satisfaction	0–3	2.30	0.65	2.37	0.57	885	1.83	.07
Maternal stressful life events scale	0–24	5.25	4.24	5.3	3.97	882	0.17	.87
Neighborhood dangerousness rating	–2–1.5	–0.05	0.61	–0.03	0.59	888	0.51	.61
Child's cognitive and social skills								
WISC intelligence standardized score	–2.4–3.1	–0.04	0.8	–0.11	0.78	887	–1.18	.24
Hostile attributional bias to peers' intentions	0–1	0.67	0.25	0.67	0.25	888	–0.24	.81
Aggressive responses to hypothetical provocation	0–40	22.57	8.29	22.14	8.1	886	–0.79	.43
Appropriateness of emotion understanding	0–4	3.58	0.72	3.55	0.8	889	–0.51	.61
Social competence rating by parent	0–3.75	2.09	0.59	2.0	0.58	888	–2.45	.01
Reading Readiness-Woodcock-Johnson Letter Word Identification	0–40	13.05	4.98	12.18	4.01	887	–2.84	.05
Emotional recognition skill	2–16	10.73	2.77	10.69	2.84	875	–0.21	.84
Parenting behavior								
Appropriate discipline	1.1–2.8	2.01	0.28	1.99	0.28	883	–0.79	.43
Physical punishment of child	0–1.67	0.21	0.22	0.24	0.24	887	2.17	.03
Verbal punishment of child	0–2	0.25	0.32	0.27	0.31	887	1.03	.30
Warmth toward child—observed interaction rating	1.1–5	3.62	0.8	3.54	0.78	886	–1.55	.12

Note: Instruments are described in detail at www.fasttrackproject.org.

Table 2**Measures Available Within Domains in the Middle School Years**

Variable	Source	Grade 6	Grade 7	Grade 8
Disruptive behavior problems				
Delinquency, aggression, and externalizing behavior				
SRD index offenses	Youth		X	X
CBCL externalizing	Parent		X	
TRF externalizing	Teacher	X	X	X
PDR aggression	Parent		X	X
Hyperactivity				
PDR Hyperactivity	Parent		X	
Peer deviance				
Best friend behavior	Youth		X	
Best friend deviance	Youth			X
Social skills				
Social skills with peers	Teacher	X	X	X
Adult relations	Teacher	X	X	X

Note: SRD = Self-Report of Delinquency; PDR = Parent Daily Report; CBCL = Child Behavior Checklist; TRF = Teacher's Report Form.

Table 3

Tobit Regression Analysis Results

Variable	Transformation	Intervention		Control		Intervention Effect	
		$\bar{X}$	SE	$\bar{X}$	SE	Coefficient	SE
Disruptive behavior problems							
Delinquency, aggression, and externalizing							
Gr7—SRD Index offenses	Cube root	0.13	−0.01	0.16	−0.01	−0.10	−0.05
Gr8—SRD Index Offenses	None	0.13	0.01	0.13	0.01	−0.03	0.06
Gr7—PDR Aggression	None	0.23	0.01	0.23	0.01	0.00	0.01
Gr8—PDR Aggression	None	0.14	0.01	0.15	0.01	0.00	0.01
Gr7—CBCL Externalizing	None	14.80	0.52	14.40	0.50	1.50	0.84
Gr6—TRF Externalizing	None	20.82	0.75	20.98	0.80	0.44	0.44
Gr7—TRF Externalizing	None	18.94	0.71	19.55	0.81	−0.33	1.08
Gr8—TRF Externalizing	None	19.63	0.75	19.34	0.83	0.70	1.23
Hyperactivity							
Gr7—PDR Hyperactivity	Square root	0.24	0.01	0.30	0.02	−0.11	0.05
Peer Deviance							
Gr7—Best Friend Bad Behavior	Square root	0.50	0.02	0.45	0.03	0.08	0.06
Gr8—Best Friend Deviant Activity		0.06	0.01	0.05	0.01	0.06	0.03
Social skills							
Gr6—Social skills	None	1.85	0.05	1.83	0.05	−0.01	0.08
Gr7—Social skills	None	1.92	0.05	1.96	0.05	0.01	0.05
Gr8—Social skills	None	1.91	0.05	1.98	0.05	−0.11	0.07
Gr6—Adult relations	None	1.88	0.06	1.94	0.06	−0.05	0.08
Gr7—Adult relations	None	1.87	0.04	1.81	0.05	0.00	0.08
Gr8—Adult relations	None	1.81	0.05	1.90	0.05	−0.11	0.07

Note: Means and standard errors are simple means errors using Rubin's Rule. Intervention effect coefficients are from Tobit analyses. SRD = Self-Report of Delinquency; PDR = Parent Daily Report; CBCL = Child Behavior Checklist; TRF = Teacher's Report Form.