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Developmental Trajectories Toward Violence in Middle Childhood: Course, Demographic Differences, and Response to School-Based Intervention

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The present study addressed 3 questions concerning (a) the course of developmental trajectories toward violence over middle childhood, (b) whether and how the course of these trajectories differed by demographic subgroups of children, and (c) how responsive these trajectories were to a universal, school-based preventive intervention. Four waves of data on features of children's social-emotional development known to forecast aggression/violence were collected in the fall and spring over 2 years for a highly representative sample of 1st to 6th grade children from New York City public elementary schools ($N = 11,160$). Using hierarchical linear modeling techniques, synthetic growth curves were estimated for the entire sample and were conditioned on child demographic characteristics (gender, family economic resources, race/ethnicity) and amount of exposure to components of the preventive intervention. Three patterns of growth—positive linear, late acceleration, and gradual deceleration—characterized the children's trajectories, and these trajectories varied meaningfully by child demographic characteristics. Most important, children whose teachers taught a high number of lessons in the conflict resolution curriculum demonstrated positive changes in their social-emotional developmental trajectories and deflections from a path toward future aggression and violence.

The last decade has witnessed a powerful convergence of developmental science and prevention science in guiding the design and evaluation of interventions aimed at preventing future aggressive and violent behavior in children and youth (Institute of Medicine, 1994; Maggs & Schulenberg, 2001). From developmental science, knowledge has grown about the mechanisms by which exposure to violence affects children's risk for such outcomes (Coie & Dodge, 1998). Our greater understanding of these causal mechanisms has led to improvements in both the design and evaluation of preventive interventions, which increasingly target these mechanisms as their focus of change (Dodge, 2001). Yet despite these advances, we still know relatively little about the developmental course of these mechanisms in middle childhood and whether the course differs by characteristics such as children's gender, socioeconomic status, and race/ethnicity.

From prevention science, knowledge has grown about intervention strategies effective at reducing children's risk for future aggressive and violent behavior (Clayton, Ballif-Spanvill, & Hunsaker, 2001; Conduct Problems Prevention Research Group, 1999; Elias, Gara, Schuyler, Branden-Muller, & Sayette, 1991; Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Webster-Stratton & Taylor, 2001; Weissberg & Greenberg, 1998). Although the literature on school-based preventive interventions is rich with studies of interventions targeted at subgroups of high-risk children, it is comparatively poorer in studies of universal preventive interventions implemented with general populations of students (Durlak, 1995). Furthermore, among the dozen or so best studies of universal school-based interventions designed to prevent conduct problems and reduce risk for future aggression and violence, a variety of methodological challenges limit the quality and generalizability of the knowledge base (Hundert et al., 1999).

In this study, we strove to make contributions both to developmental science and to prevention science by examining growth trajectories in domains of development thought to forecast future

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violent and aggressive behavior and by using those trajectories to evaluate one of the largest universal school-based violence prevention programs in the country, the Resolving Conflict Creatively Program (RCCP). In the following sections, we (a) briefly review and justify the domains of development we examined for growth over middle childhood, (b) describe the RCCP and highlight the key features of the intervention for which program implementation may vary, and (c) describe why trajectories of growth are superior to single-point-in-time measures of outcome variables for evaluations of preventive interventions. Finally, we specify the three questions we set out to answer in this study on developmental trajectories toward violence in middle childhood regarding their course, demographic differences, and response to a school-based universal preventive intervention.

The Domains of Development

In the design of this study, constructed collaboratively by practitioners and researchers (Aber, Brown, Chaudry, Jones, & Samples, 1996), we proposed to focus on three domains of social-emotional development known to forecast future aggressive and violent behavior and that were hypothesized both to change over the course of middle childhood and to be responsive to change that was due to children's participation in the RCCP. The first domain, *teachers' perceptions of children's aggressive and prosocial behaviors*, is face valid as an indicator of program impact and has been used successfully in prior evaluations of school-based preventive interventions (Greenberg, Kusche, Cook, & Quamma, 1995; Kellam et al., 1998).

We also collected children's reports of their own *behavioral symptomatology*, specifically, their levels of conduct problems, depressive symptoms, and aggressive fantasies. Child-reported behavioral problems have also been used extensively in prior evaluations of preventive interventions (Conduct Problems Prevention Research Group, 1992; Dahlberg, Toal, & Behrens, 1996; Elias et al., 1991; Farrell & Meyer, 1997), with reports of conduct problems being one of the strongest predictors of later maladjustment, including delinquency (White, Moffitt, Earls, Robins, & Silva, 1990) and conduct disorder in adolescence (Loeber, 1991). Because both teacher- and child-reported indicators may be especially vulnerable to reporting bias, it is generally recommended that results be compared on the basis of different sources of data (e.g., child self-report and teacher ratings) and derived from different analytic techniques (e.g., hierarchical as well as general linear modeling) (Conduct Problems Prevention Research Group, 1999; Keiley, Bates, Dodge, & Pettit, 2000).

Finally, on the basis of prior developmental theory and research (Coie & Dodge, 1998; Dodge, Pettit, Bates, & Valente, 1995; Dodge, Pettit, McClaskey, & Brown, 1986; Schultz & Selman, 2002; Selman, Beardslee, Schultz, Krupa, & Podoresky, 1986), we collected data on a variety of *social-cognitive processes* known to place children at risk for future aggressive and violent behavior. In a recent major review of the theoretical and empirical literature on aggressive and antisocial behavior, Coie and Dodge (1998) emphasized the current need for studies that specify the processes and mechanisms by which poor, ethnically diverse, and highly mobile urban neighborhoods are related to heightened crime and violence (see also Aber, 1994). On the basis of their thorough analysis, Coie and Dodge (1998) stated that "an environmental variable will influence human aggressive behavior if it affects one or more of three mental processes: (a) the perception of threat and experience of irritation or fear; (b) the accessibility of aggressive responses in one's memorial repertoire; and (c) the evaluation that aggression will lead to desirable positive consequences" (p. 795). In the present study, we focused on two of these types of mental processes. To examine children's perception of threat, we assessed their hostile attribution bias, namely, the tendency to attribute hostile intent to an ambiguous or prosocial cue (Aber, Jones, Brown, Chaudry, & Samples, 1998; Dodge, Price, Bachorowski, & Newman, 1990). To examine the accessibility of aggressive responses in children's memorial repertoires, we assessed children's aggressive (and competent) responses to hypothetical interpersonal negotiation situations (Leadbeater, Hellner, Allen, & Aber, 1989; Selman et al., 1986).

Each of these types of mental processes (a) is affected by certain types of experiences (e.g., a history of harsh, punitive, or abusive parenting [Dodge et al., 1995; Patterson, Reid, & Dishion, 1992; Weiss, Dodge, Bates, & Pettit, 1992] or a peer environment in which violence is normative [Bierman & Wargo, 1995; Coie & Jacobs, 1993; Tremblay, Masse, Vitaro, & Dobkin, 1995]) and, in turn, (b) increases the probability of aggression/violence by children and youth (Guerra & Slaby, 1990; Huesmann & Guerra, 1997). In other words, each of these mental processes constitutes a potential causal mechanism linking early exposure to ecological risk with later developmental outcomes of aggression and violence (Dodge, Bates, & Pettit, 1990).

Such mental processes have been associated with aggression and violence both concurrently (Dodge, 1986; Dodge et al., 1986, 1990; Lochman & Dodge, 1994) and over a short time period (e.g., over 2 successive years; see Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999) in young children and adolescents. However, no longitudinal studies have been identified that described the form of children's developmental growth trajectories in these mental processes during middle childhood or that used racially, ethnically, and socioeconomically diverse samples large enough that demographic subgroup differences in growth trajectories could be examined. Although there is an extensive literature on gender, socioeconomic, and racial/ethnic differences in the aggressive and violent behavior of children and youth (Conger et al., 1992; Elliott, Ageton, Huizinga, Knowles, & Canter, 1983; Offord, Boyle, & Racine, 1991; Patterson, Kupersmidt, & Vaden, 1990), most of these studies examined cross-sectional differences or differences in growth rates measured as change between two points in time. None examined growth over the 6-year period of elementary school using an accelerated longitudinal design and growth curve modeling. Consequently, no prior studies have been able to test for subgroup differences in level (intercept), slope (linear change), and rate of acceleration or deceleration (curvilinear change) in aggressive and violent behavior or their developmental correlates.

The Intervention

The RCCP, a universal, school-based intervention involving violence prevention and intergroup understanding, was developed collaboratively over time by Educators for Social Responsibility Metropolitan Area (ESR Metro) and the New York City Board of Education. Since its founding in 1985, the RCCP has served

over 6,000 teachers and 200,000 children in several hundred New York City public schools. The RCCP is also currently being implemented in 12 other diverse school systems across the United States from Anchorage, Alaska, to Atlanta, Georgia, by the RCCP National Center, an initiative of the national ESR and local partners. The main goal of the RCCP is to change the mental processes and interpersonal behavioral strategies that lead children to engage in aggression and violence by teaching them constructive conflict resolution strategies and promoting positive intergroup relations.

Specific program objectives are to (a) make children aware of the different choices they have besides passivity or aggression for dealing with conflicts, (b) help children develop skills for making those choices real in their own lives, (c) encourage children's respect for their own culture and those of others, (d) teach children how to identify and stand against prejudice, and (e) make children aware of their role in creating a more peaceful world.

The intervention has two major components: (a) training and coaching of teachers to support them in implementing a curriculum in conflict resolution and intergroup understanding (*teacher training and coaching*) and (b) the delivery of that curriculum via classroom instruction for children provided by the trained teachers (*classroom instruction*). Additional features of the RCCP include peer mediation, principals' training, and parent training. (See Aber et al., 1996, for a more detailed description of the intervention. See Clayton et al., 2001, for a detailed description of how the RCCP compares to other violence prevention, conflict resolution, and peace programs for elementary school children.)

To reflect the normal evolution of RCCP implementation within a school, and to maximize external validity for a test of the program as implemented on children's development, we used a quasi-experimental design. Four schools were identified in each of four school districts in New York City and were recruited to participate in the evaluation. Each school represented one of four different stages of program evolution. Presumably, teachers also varied both within and across schools in their level of interest and enthusiasm for participating in and implementing the RCCP. Because children were arbitrarily assigned to teachers independent of teacher's willingness to participate in the RCCP, a quasi-experimental design still permitted us to make an unbiased estimate of the effects on children's development of their exposure to RCCP teachers. (See the Method section for details of school selection.)

Many prevention programs are well founded on research-based theoretical principles, are rigorously evaluated for efficacy, and are often quite expensive, but they rarely, if ever, solve the multifaceted problems of how the programs might go to scale. Other programs, in contrast, grow out of practice-based philosophies, solve the financial, bureaucratic, and implementation challenges required to go to scale, but are of unknown efficacy and validity. Each type of program offers a different profile of opportunities for and challenges to service delivery and knowledge development. In an earlier publication (Aber et al., 1996), we described the reciprocal process by which the research and intervention teams collaborated to make the RCCP's implicit program theory explicit and to draw on developmental theory and method to design a fair and disciplined test of the effects of the program as implemented on children's development. In another report, we described the 1st-year (two-wave) results based on a subset of child-report measures (Aber et al., 1998). In this study, for the first time, we report the 2-year (four-wave) results based on both child- and teacher-report measures of this evaluation.

Prior research both on the RCCP (Aber et al., 1996, 1998) and on other school-based prevention efforts (e.g., Conduct Problems Prevention Research Group, 1999) suggests that even well-designed and supervised interventions demonstrate great variation in both the dosage and the quality of the intervention to which the students are exposed. Indeed, in early work with this sample, hierarchical linear regressions were used to test the separate and combined influence of the RCCP intervention components on change over Year 1 (from Wave 1 to Wave 2) in child-reported outcomes. These analyses revealed that after the amount of training and coaching a teacher received was controlled, the more classroom instruction children received in the RCCP, the *slower* their growth over Year 1 in negative outcomes and the *slower* their decline in positive outcomes. However, the results also revealed that after we controlled for its shared variance with classroom instruction, the amount of teacher training and coaching was related to an *increase* in negative outcomes and a *decrease* in positive outcomes over Year 1 (Aber et al., 1998).

Building on this work, we developed measures of variation in the implementation of the RCCP (both within a particular year and summed across 2 years) in order to examine how this variation affected children's development over 2 years. Our hypothesis was that children whose teachers implemented more classroom instruction in the conflict resolution curriculum of the RCCP but received only a moderate amount of training and coaching would benefit the most (Aber et al., 1998).

Change in Developmental Trajectories as the Measure of Program Impact

Most preventive interventions aim to decrease risk factors and/or increase protective factors at various levels of children's ecologies with the goal of altering their trajectories toward positive outcomes and away from negative outcomes. Although both program and developmental theories draw on the concept of trajectories, it is only recently that trajectories per se (rather than point-in-time or cumulative [summed over time] scores) have actually been employed as measures of developmental outcomes and/or program impact (see Hundert et al., 1999; Maggs & Schulenberg, 2001; Vitaro, Brendgen, & Tremblay, 2001). In this study, developmental trajectories of (a) teachers' reports of children's aggressive and prosocial behaviors, (b) children's reports of their own behavioral symptomatology, and (c) children's social-cognitive processes were used as the measures of program influence because of their assessment at four points in time over 2 consecutive school years (fall and spring in 1994–1995 and 1995–1996) in a cross-sequential design. This study used three parameters (intercept, linear change, and curvilinear change) to define growth trajectories in the three developmental domains of interest.

In summary, this study addressed three sets of questions unanswered by previous research in developmental and prevention science. First, what are the shapes of children's social-emotional developmental trajectories toward violence over the elementary school years? Do the shapes of these trajectories vary by domain of social-emotional development and method of assessment (e.g., child report vs. teacher report)? Although we expected some measures of children's social-cognitive and behavioral risk for

future aggression and violence to increase over the elementary school years (Aber et al., 1998), other such measures may decrease (Nagin & Tremblay, 2001), and the precise nature of these changes (e.g., linear, curvilinear) may vary.

Second, do children's developmental trajectories differ for demographic subgroups? Most analyses of demographic differences in paths to violence have been based on cross-sectional findings or differences between two points in time. Because there are many different paths between two points, trajectories will be more revealing of gender, racial/ethnic, and family-resource differences than will other methods. On the basis of reviews of prior literature, we hypothesized that boys, low-income children, and minority children would demonstrate higher initial levels (intercepts) on measures of aggression than would girls, higher income children, and White children. However, there is insufficient theory or research to predict subgroup differences in linear or curvilinear change in these domains of social-emotional development during middle childhood.

Finally, and most important, are children's developmental trajectories modifiable by degree of exposure to a school-based universal violence prevention program? We hypothesized that children whose teachers provided high levels of classroom instruction in the RCCP curriculum would demonstrate lower intercepts and smaller increases in their teachers' reports of their aggressive behaviors, in their own reports of their behavioral symptomatology, and most important, in key social-cognitive processes thought to place elementary school children at risk for future aggression and violence.

Method

Procedure

Data for this study were collected in the fall and spring of the 1994–1995 and 1995–1996 school years. During the 1994–1995 school year, the RCCP was implemented in 112 of the 1,067 New York City public elementary, middle, and high schools. This evaluation focused on the children and teachers in 15 of these elementary schools across four school districts in New York City. (Field conditions for Year 1 of data collection necessitated certain design modifications. One school dropped out 6 months after beginning the evaluation, reducing the number of participating schools from 16 to 15.) The elementary schools were initially divided into four groups on the basis of stage of intervention: nonintervention, the beginning stage of intervention, integration of some program components, and integration of all program components. To reduce possible confounds, the schools in each group were drawn equally from four major school districts within the city of New York. Groups of schools were chosen whose student race/ethnicity, poverty status, and school size were comparable both across districts and stages of RCCP evolution and that were representative of the public elementary school population in New York City. This quasi-experimental evaluation design (a) allowed the relative effects of no program implementation to be compared with varying levels of implementation, (b) maximized external validity for a test of the program as implemented on children's development, and (c) examined whether the RCCP met its own self-defined goals and objectives in these 15 schools. (See Aber et al., 1996, for a full description of the design and rationale of the evaluation.)

Sample

Data for the present article came from all four waves of data collection in both years of the evaluation, and the sample includes first- through sixth-grade students and their classroom teachers from each of the 15 participating schools. Students who were severely mentally or physically challenged, as identified by school principals, were excluded from the study. Otherwise, all students in each of the 15 participating schools were included in the study unless a "refusal to participate" form was returned by a parent or signed by a student or if a student was discharged from the school. (This passive consent procedure, approved both by the Office of Educational Research at the New York City Board of Education and by the Institutional Review Board of Columbia University, was voluntarily implemented by the principal investigator following a waiver of active consent based on a Single Project Assurance, submitted to the Office for Protection from Research Risks of the National Institutes of Health, U.S. Department of Health and Human Services.)

On the basis of these criteria, a total of 11,160 children participated in this study and had nonmissing data in at least one of the four data collection waves across the 2 evaluation years. As shown in Table 1, the sample was 48% female, 40% Black, 41% Hispanic, 14% White, and 5% other (including Native American and Asian American), and approximately 86% of the sample were receiving free school lunches. On key demographic factors, this sample of children resembled the larger population of children receiving the RCCP. Data were also collected from 375 teachers in Year 1 and 371 teachers in Year 2 of the study.

Overall, rates of participation within waves ranged from 75% to 84% for students and from 80% to 87% for teacher questionnaires. Of the 11,160 children included in this study, approximately 9% participated at only one time point, 42% participated at two time points, 4% at three time points, and 45% at four time points. The low percentage of children participating at only three time points resulted from the infrequent situation in which a child was present in 1 full year of the study and in only one additional wave in the other year because of either dropping out of or entering the school in the middle of the academic year. These within-year and across-year percentages are consistent with the within-year and across-year mobility of

Table 1
Sample Demographic Characteristics

Characteristic	Value
Total *N*[a], children	11,160
Total *N*, teachers	
Year 1	375
Year 2	371
Mean age (in years)	
Wave 1	8.81
Wave 2	9.13
Wave 3	8.62
Wave 4	8.99
Grade (%)	
Year 1	
Grades 1, 2, and 3	57.3
Grades 4, 5, and 6	42.7
Year 2	
Grades 1, 2, and 3	58.5
Grades 4, 5, and 6	41.5
Gender (%)	
Boys	51.9
Girls	48.1
Race/ethnicity (%)	
Hispanic	41.1
Black	39.6
White	14.5
Other	4.8
School lunch eligibility status (%)	
Free	85.9
Full and reduced price	14.1

[a] Total *N* in subsequent analyses varies slightly because of missing data.

students in the New York City public school system. One-way analyses of variance used to test for differences between these groups revealed that children who participated at fewer time points scored significantly lower in reading ($\eta^2 = .005$) and math ($\eta^2 = .006$) achievement in the spring of 1994 and had higher rates of absence during Year 1 ($\eta^2 = .007$) and Year 2 ($\eta^2 = .011$) of the evaluation than did children who participated more frequently.

Constructs and Variables

Data for the present study were collected from four different sources. Data on exposure to the RCCP curriculum were extracted from Years 1 and 2 of the Management Information System designed and operated by ESR Metro. Student demographic data were gathered from school record information provided by the New York City Board of Education. Key demographic variables included in this analysis were student gender, race/ethnicity (Black, White, Hispanic), and school lunch eligibility status (full price, reduced price, free), which served as a proxy for family socioeconomic status.

Individual student developmental data were collected via child- and teacher-report assessments in both the fall and spring of the 2 consecutive school years. Child-report data were collected by a multiracial field research team using classroom-based group administration procedures during classroom periods, whereas teacher-report data on children were collected from individual teachers at the end of each data collection wave.

Levels of intervention. Exposure to the intervention was operationalized using data on two primary RCCP components: teacher training and coaching in the RCCP and classroom instruction in the RCCP. Additional dimensions of the RCCP include peer mediation, principals' training, and parent training. These additional program features are much more difficult to reliably and validly measure and therefore were either not operationalized (administrator and parent training) or not considered in the present article (peer mediation).

Teacher training and coaching is a count of the number of contacts a teacher had with the RCCP and consists of training sessions attended, one-on-one meetings with an RCCP staff developer, and classroom visits by the staff developer. Teachers new to the RCCP receive a 25-hr training course to introduce them to the ideas and skills of conflict resolution and to the RCCP curriculum (see below). Topics addressed during training include active listening, assertiveness, affirmation (building self-esteem), anger management, mediation, celebrating differences, and standing up to bias. In addition to the training, the program design calls for each teacher new to the program to receive 10 visits in the course of the year by an RCCP staff developer, who coaches the teacher in implementing the curriculum in his or her classroom. Coaching consists of demonstration lessons, co-planning and co-facilitation of lessons, observations, and one-on-one conferences.

The number of contacts ranged from 0 to 20 over the course of Year 1 and from 0 to 19 in Year 2, with an average of four contacts in each year. The teacher training and coaching variable was skewed in Year 1 (skewness = 3.56, kurtosis = 13.61) and Year 2 (skewness = 2.33, kurtosis = 5.57) because of the large percentage of children whose teachers were either not trained in the RCCP (received no teacher training and coaching: Year 1 = 69%; Year 2 = 62%) or were trained previously but did not report receiving any additional training or coaching (Year 1 = 10%; Year 2 = 5%). Thus, both the Year 1 and Year 2 teacher training and coaching variables were recoded into two scales with values ranging from 0 to 4. In each year, children with recoded scale values of 0 had teachers who received no teacher training and coaching. Children with recoded scale values of 1 had teachers in each year who received initial training in the RCCP but no additional training or support. Children with recoded scale values of 2 had teachers in each year who received an average of between 1 and 2 teacher training and coaching sessions. Children with recoded scale values of 3 had teachers who received between 3 and 5 training and coaching sessions in Year 1 ($M = 4$) and between 3 and 7 sessions in Year 2 ($M = 5$). Finally, children with recoded scale values of 4 had teachers who received between 6 and 20 training and coaching sessions in Year 1 ($M = 11$) and between 8 and 19 sessions in Year 2 ($M = 10$). The range of raw score values within each recoded scale value differs between years as a result of approximating equal distributions of children in the nonzero scale categories within each year.

As noted above, the majority of teachers in each year were not trained and received no teacher training and coaching (i.e., those teachers with scores of 0 on the recoded teacher training and coaching scale; see above). The remaining teachers were evenly distributed among the recoded values. In Year 1, for example, 20 teachers (5%) received between 1 and 2 training and coaching sessions, and 23 (6%) received between 6 and 20 sessions. Similarly, in Year 2, 43 teachers (12%) received between 1 and 2 training and coaching sessions, and 32 (9%) received between 8 and 19 sessions.

The two recoded scale scores in each year were then summed to equal the total number of contacts that any given child's Year 1 and Year 2 teachers had with the RCCP over the course of the 2-year evaluation period. This cumulative index of Year 1 and Year 2 teacher training and coaching ranged from 0 to 8 and had a mean of 1.30 ($SD = 1.81$, skewness = 1.15), which, when considered in terms of raw teacher training and coaching, is equivalent to 1 contact. The standard deviation, when considered in terms of raw teacher training and coaching, indicates that 68% of the sample received between 0 and approximately 28 contacts across the 2 years. Forty-two percent of the children in the sample were taught in one or both years by teachers who received at least some teacher training and coaching.

Classroom instruction in the RCCP is composed of the total number of lessons given by trained teachers to children in their classrooms. Lessons given by teachers were based on the RCCP elementary school curriculum and focused on key skills such as active listening, assertiveness, negotiation, and problem solving. Across Years 1 and 2, the three most common types of RCCP lessons given were about "communication," "conflict," and "feelings," accounting for almost 40% of the total RCCP lessons taught in Year 1 and Year 2. Skills were taught through role playing, interviewing, small group discussion, and brainstorming.

The number of lessons taught over the course of Year 1 ranged from 0 to 80, with children of RCCP-trained teachers receiving an average of 13 lessons. In Year 2, the number of lessons given ranged from 0 to 115, with children receiving an average of 14 lessons. Again, in order to adjust for the skewness in the distribution of the classroom instruction variables in Year 1 (skewness = 3.38, kurtosis = 13.17) and Year 2 (skewness = 4.56, kurtosis = 27.81) that was due to the large number of children whose teachers were either not trained in the RCCP (and therefore did not teach any lessons: Year 1 = 69%; Year 2 = 62%) or were trained but did not report implementing any classroom instruction (Year 1 = 8%; Year 2 = 10%), the number of lessons for each year was recoded into a scale with values from 0 to 5. In each year, children with recoded scale values of 0 had teachers who received no RCCP training and thus implemented no classroom instruction in the RCCP. Children with recoded scale values of 1 had teachers in each year who were trained but did not report implementing any classroom instruction. Children with recoded scale values of 2 received between 1 and 4 lessons in Year 1 ($M = 3$) and between 1 and 6 lessons in Year 2 ($M = 5$). Children with recoded scale values of 3 received between 5 and 11 lessons in Year 1 ($M = 8$) and between 7 and 11 lessons in Year 2 ($M = 8$). Children with recoded scale values of 4 received between 12 and 27 lessons in Year 1 ($M = 21$) and between 12 and 21 lessons in Year 2 ($M = 16$). Finally, children with recoded scale values of 5 received between 28 and 80 lessons in Year 1 ($M = 41$) and between 22 and 115 lessons in Year 2 ($M = 40$). As with the teacher training and coaching variable, the range of raw score values within each recoded scale value differs between years as a result of approximating equal distributions of children in the nonzero scale categories within each year.

Although the majority of teachers in each year were not trained and thus implemented no RCCP classroom instruction (i.e., those teachers with scores of 0 on the recoded classroom instruction scale; see above), the remaining teachers were again evenly distributed among the recoded values. In Year 1, for example, 22 teachers (6%) implemented between 1 and 4 lessons, and 22 teachers (6%) implemented between 12 and 27 lessons. Similarly, in Year 2, 33 teachers (9%) implemented between 7 and 11 lessons, and 25 (7%) implemented between 12 and 21 lessons.

The two recoded scale scores in each year were then summed to equal the total number of RCCP lessons to which children had been exposed across the 2 years of the study. This cumulative index of Year 1 and Year 2 classroom instruction ranged from 0 to 10, with an average of 1.48 ($SD = 2.22$, skewness = 1.48), which, when considered in terms of raw lessons, is equivalent to between 1 and 4 lessons. The standard deviation, when considered in terms of raw lessons, indicates that 68% of the sample received between 0 and approximately 28 lessons across the 2 years. Again, 42% of the children in this sample were taught in one or both years of the study by teachers who were trained in the RCCP or who implemented at least some RCCP classroom instruction.

The cumulative indices of classroom instruction and teacher training and coaching were strongly positively correlated ($r = .80$) for the sample as a whole but only modestly correlated ($r = .40$) for the subsample (42%) of children whose teachers received some teacher training and coaching and implemented some classroom instruction (i.e., those teachers with recoded scale values for each variable that were greater than or equal to 1). In light of the correlation between teacher training and coaching and classroom instruction, we examined (a) the main effects of each intervention component while controlling for the effects of the other component and (b) the interaction between teacher training and coaching and classroom instruction.

The outcome measures included in this article were collected from both children and teachers.[1] On the basis of previous research and developmental theory, the child-report data were conceptualized as falling within two broad domains: social-cognitive processes and children's reports of their own behavioral symptomatology. Teacher-report data focused specifically on children's aggressive and prosocial behaviors as observed by their classroom teachers.[2] The use of data from teacher reports, child self-reports, and child responses to hypothetical situations provides a multitrait, multimethod strategy for more rigorously evaluating whether the program is effective in altering the underlying constructs and behaviors targeted by the RCCP and for maximizing the internal validity of the study. Although promoting intergroup understanding is also a major goal of the RCCP, the evaluation research team was unable to identify measures of these processes in the mid-1990s that were valid, reliable, age-appropriate, as well as amenable to classroom-based administration.

Social-cognitive processes. Three features of children's social-cognitive processes were measured via self-report: children's hostile attribution biases and their competent and aggressive interpersonal negotiation strategies. Children's hostile attribution biases were measured with an adaptation of the Home Interview originally developed by Dodge (1986). This instrument contains six items that assess children's hostile attributional biases toward peers. Each of six hypothetical vignettes was read aloud while children viewed an accompanying illustration. In each vignette, children were asked to imagine themselves as the recipient of a provocation involving a peer, the cause of which was both visually and verbally ambiguous. Children were then asked about the cause of the provocation, and they selected one of four possible causal attributions. The subscale was created by recoding item responses as either 1 (*hostile*) or 0 (*benign*) and then averaging across items. Alphas for this scale ranged from .74 to .78 for the sample as a whole across the four assessment waves.

Competent interpersonal negotiation strategies in proactive situations were measured with the Social Problem Solving Measure developed by Lochman and Dodge (1994). This instrument was designed to assess the interpersonal skill level of children's selected responses to eight hypothetical vignettes (and their accompanying illustrations), each of which describes a social problem requiring some initiative on the part of the child. The subscale was created by recoding item responses as either 1 (*competent*) or 0 (*noncompetent*) and then averaging across items. Sample alphas across the four waves ranged from .56 to .59.

Aggressive interpersonal negotiation strategies in reactive situations were measured using the Home Interview (Dodge, 1986). Following assessment of their attributions of intent, children were asked what they would do next in each of the six scenarios, and they selected from among four possible response strategies. The subscale was created by recoding item responses as either 1 (*aggressive*) or 0 (*nonaggressive*) and then averaging across items. Scale reliabilities ranged from .87 to .90 for the sample as a whole across the four waves.

Behavioral symptomatology. Three features of children's self-reported behavioral symptomatology were measured: self-report levels of conduct problems, depressive symptoms, and aggressive fantasies. Conduct problems were composed of an average of eight items from the Seattle Personality Inventory (Greenberg, 1994). Sample items include "Do you get into a lot of fights?" and "Do you tease or make fun of other kids?" Scale alphas ranged from .73 to .79 across the four waves.

Depressive symptoms were measured as the average of 11 items from the Seattle Personality Inventory (Greenberg, 1994). Sample items include "Do you feel unhappy a lot?" and "Do you feel that most things are not that much fun?" Reliabilities across the four waves ranged from .73 to .76.

Aggressive fantasies were measured using the What I Think instrument (Huesmann & Eron, 1986; Rosenfeld, Huesmann, Eron, & Torney-Purta, 1982). The subscale was calculated as the average of six items, with sample items such as "Do you sometimes have daydreams about hitting or hurting someone you don't like?" Alphas for this scale ranged from .58 to .63 across the four waves.

Teacher perceptions of child behavior. Two constructs concerning teachers' perceptions of children's behavior were assessed: child aggressive behavior and child prosocial behavior. Child aggressive behavior comprised an average of six items from the Teacher Checklist (Dodge & Coie, 1987). The measure assesses both reactive and proactive aggression. Child aggressive behaviors were rated by teachers using a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*always*). Sample items include "When this child is teased or threatened, he or she gets angry easily" and "This child threatens or bullies others in order to get his or her own way." The alpha for the total scale was .95 at each of the four assessment waves.

Child prosocial behavior was assessed using an average of 19 items from the Social Competence Scale (Conduct Problems Prevention Research Group, 1991). Child prosocial behaviors were rated by teachers using a 5-point Likert type scale ranging from 1 (*not at all)* to 5 (*very well)*. Sample items include "is helpful to others" and "acts friendly toward others." Scale alphas for the sample were .98 across each of the four assessment waves.

All scale reliabilities were examined by child gender, race/ethnicity, socioeconomic status (i.e., school lunch eligibility), and grade level and were found to be at a minimum above .6 and more frequently above .7 in

[1] All measures from the evaluation protocol appear in a compendium, prepared by the Centers for Disease Control and Prevention, of measures used in evaluations of violence prevention programs (Dahlberg et al., 1996).

[2] Child-report outcomes were originally conceptualized as falling into three general categories: social cognitions, interpersonal negotiation strategies, and psychological symptomatology (Aber et al., 1998). Factor analyses designed to explore the structure among these child-report outcomes revealed two primary dimensions: behavioral symptomatology and social-cognitive processes. In this article, these dimensions have both been confirmed and extended to include depressive symptoms as an outcome within the domain of behavioral symptomatology and teachers' perceptions of child behavior as its own distinct domain.

all cases with two exceptions. As with the alphas for the competent strategies and aggressive fantasies scales, the subgroup alphas for these variables also occasionally fell between .5 and .6 and in a few cases dipped below .5, primarily for the youngest children. Means and standard deviations of all child- and teacher-reported outcomes are presented in Table 2.

Results

Background

The use of a short-term longitudinal design with repeated measures provides data with a hierarchical or multilevel structure. This article focuses on two levels of the hierarchy: Level 1 units are composed of the repeated assessments over time nested within students; Level 2 units are composed of person-level (between-subjects) characteristics such as demographic factors and exposure to intervention. Because children changed classrooms (and therefore teachers) between Years 1 and 2 of the evaluation, cumulative exposure to the RCCP across the 2-year period was conceptualized for this article as a person-level characteristic. Year 2 classroom size averaged 23 children. The number of children in Year 2 classrooms who had at least one classmate from their Year 1 classroom in their class ranged from 0 to 23, with an average of 16. On average, four Year 1 classrooms contributed to each Year 2 classroom. Because repeated assessments were expected to be more similar within subjects than between subjects, the assumption of independence may have been violated, thus requiring statistical methods that allow for the decomposition of variance into its within- and between-subjects components.

Analyses for this article were conducted using the Hierarchical Linear Modeling (HLM) 5.01 software package, with full maximum likelihood estimation used for all models. HLM allows for the simultaneous estimation of variance associated with individual (within-subject) and population (between-subjects) growth curves based on the specification of fixed- and random-effect variables in the model (Bryk & Raudenbush, 1987, 1992; Burchinal, Bailey, & Snyder, 1994). HLM also allows for missing data at the time-varying (within-subject) level because individual growth curves are assumed to vary systematically around population (between-subjects) growth curves. As such, there may be one or more missing data points in any longitudinal design. In this study, the assessment of an entire subpopulation of first- through sixth-grade children (average ages ranging from 6.0 to 12.5 years) at four different time points enabled us to estimate patterns of growth over time as well as across ages. With each subject's growth represented up to four times (and thus at four different ages), we were able to estimate developmental trajectories across age, with each subject having a series of data points that were purposefully incomplete at the time-varying level (see Figure 1). For example, although 7-year-old children in second grade at the Wave 1 assessment (fall 1994) were approximately 1 year older and one grade ahead by the Wave 3 assessment (fall 1995), because all children were assessed in each school at each time point, a new cohort of 7-year-old children entered the second-grade sample in the 2nd year (fall 1995), allowing for the synthesis of data from all 7-year-old children at any point in the study.

Each developmental trajectory is composed of an intercept (B_0, estimated score on a given outcome for the mean age of children at Time 1), a slope (B_1, estimated linear change over time, i.e., across ages 6.0 to 12.5), and a quadratic function (B_2, estimated rate of acceleration/deceleration over time, i.e., across ages 6.0 to 12.5). In order to ensure the stability of the intercept, initial status was defined as the mean age of the sample at Time 1. Therefore, the time-varying element, age, was centered on age 8.8. Any differences reported in intercepts should be interpreted in the subsequent figures as differences when the children were 8.8 years old. The use of an accelerated longitudinal design with purposefully incomplete data enables outcome scores to be estimated backward to the ages of the youngest children in the sample ($\sim$ 6.0 years) and forward to the ages of the oldest children in the sample ($\sim$ 12.5 years).

Developmental trajectories estimated in the unconditional models are represented by the following equations:

Level 1 model:

$$Y(\text{target outcome}) = \pi_0 + \pi_1(\text{age} - 8.8) + \pi_2(\text{age} - 8.8)^2 + e$$

Level 2 model:

$$\pi_0 = \beta_{00} + r_0$$

$$\pi_1 = \beta_{10} + r_1$$

$$\pi_2 = \beta_{20} + r_2.$$

Because our parameter estimates for the outcome trajectories were based on a sample that included children with as few as one out of four data points (e.g., approximately 51% had only one or two data points), our ability to adequately detect the significance of the three random components when estimated simultaneously was compromised. To balance the generalizability afforded by this

Table 2
Child- and Teacher-Reported Outcome Variable Means (and Standard Deviations)

Variable	Wave 1: Fall 1994	Wave 2: Spring 1995	Wave 3: Fall 1995	Wave 4: Spring 1996
Hostile attribution bias	0.42 (0.31)	0.46 (0.34)	0.49 (0.34)	0.48 (0.34)
Aggressive INS	0.30 (0.35)	0.35 (0.38)	0.35 (0.38)	0.34 (0.38)
Competent INS	0.52 (0.25)	0.49 (0.25)	0.47 (0.25)	0.47 (0.25)
Aggressive fantasies	1.92 (0.51)	1.96 (0.49)	1.92 (0.49)	1.93 (0.50)
Conduct problems	1.32 (0.26)	1.35 (0.29)	1.31 (0.28)	1.31 (0.27)
Depressive symptoms	1.48 (0.25)	1.49 (0.25)	1.47 (0.26)	1.48 (0.26)
Aggressive behavior	2.12 (1.06)	2.25 (1.07)	2.04 (1.02)	2.15 (1.04)
Prosocial behavior	3.63 (0.84)	3.38 (1.01)	3.42 (1.00)	3.47 (0.98)

Note. INS = interpersonal negotiation strategies.

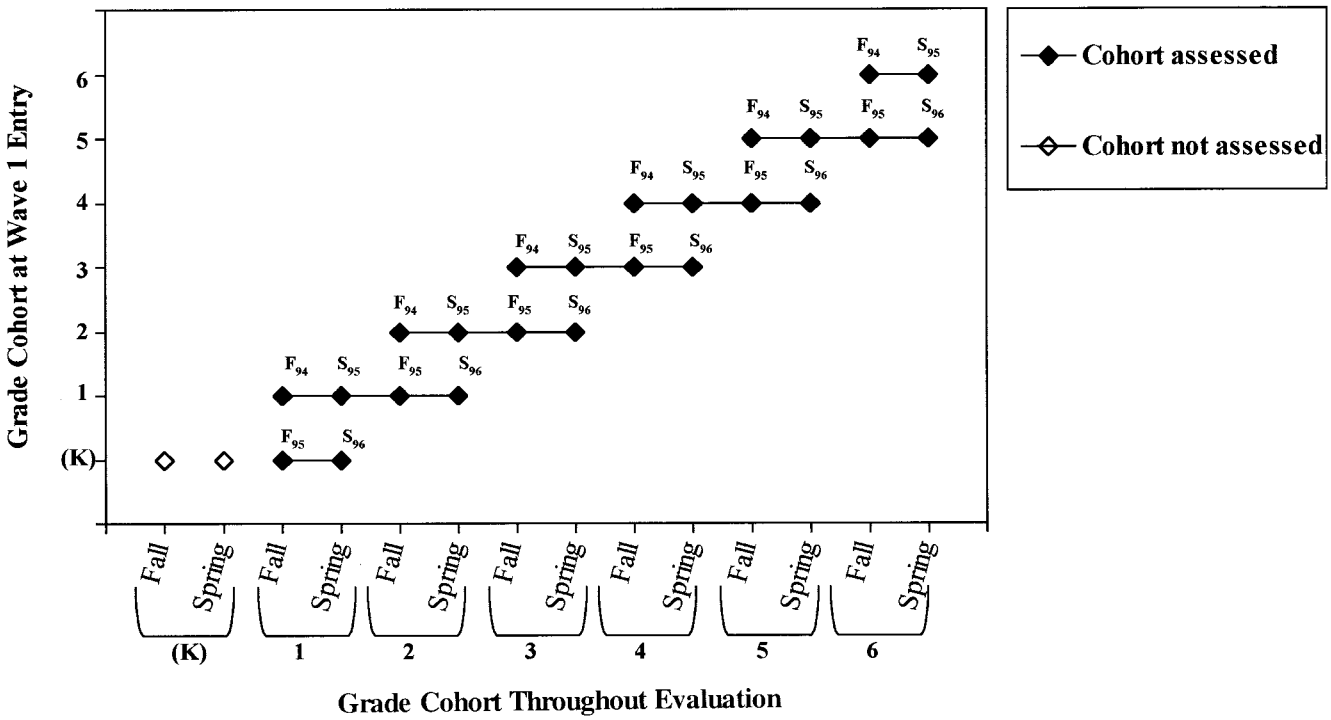

Figure 1. Configuration of data collection for accelerated longitudinal design with purposefully incomplete data. F = fall; S = spring; K = kindergarten.

large sample and to maximize the precision with which we could estimate model parameters, we estimated the random components of the linear and curvilinear parameters sequentially (i.e., fixing the linear component and estimating the curvilinear component and then vice versa). Coefficients across these two models were nearly identical.

For each of the targeted outcomes, results from the unconditional model indicated significant unexplained variation around the intercept, linear, and quadratic parameters. These results suggested that individual children varied significantly in each of the targeted outcomes in intercept, rates, and shape of change over time (across ages 6.0 to 12.5). Modeling the parameters of intercept, linear change, and curvilinear change was therefore necessary to adequately understand children's trajectories on these measures of social-emotional development.

Model Testing

The following sections describe three sets of models designed to address the three questions proposed in this study. For each outcome, the three sets of models to be discussed are as follows: (a) a series of unconditional models estimating the pattern (or course) of developmental growth over 6 years in each outcome for the sample as a whole, not controlling for child demographic characteristics and intervention status; (b) a series of conditional models estimating the effects of child demographic characteristics (i.e., gender, school lunch status, and race/ethnicity) on the intercept and rate of growth for each outcome; and (c) a series of conditional models estimating the effects of children's exposure to each of the two main RCCP intervention components on the growth trajectories of each outcome, controlling for key child demographic characteristics.

Social-cognitive processes. Results of the models examining unconditional growth for the three constructs measuring children's social-cognitive processes were highly similar. The correlation (tau) between intercept and growth for each outcome ranged between .27 (for competent interpersonal negotiation strategies) and .55 (for aggressive interpersonal negotiation strategies), indicating that children who reported higher levels of competent and aggressive interpersonal negotiation strategies at age 8.8 (intercept) also reported greater increases over time.

As shown in Table 3 (Unconditional column), the overall pattern of the trajectories for each of these three outcomes was characterized by significant linear and curvilinear change over time. Specifically, from ages 6.0 to 12.5, the average growth trajectories of hostile attributional bias and aggressive interpersonal negotiation strategies demonstrated positive linear change ($t = 11.72$, $p < .001$, and $t = 12.12$, $p < .001$, respectively) and positive curvilinear change (acceleration; $t = 4.42$, $p < .001$, and $t = 9.20$, $p < .001$, respectively). The growth trajectory for competent interpersonal negotiation strategies was marked by positive linear change ($t = 20.81$, $p < .001$) and negative curvilinear change (deceleration; $t = -19.13$, $p < .001$). As shown in Figure 2, hostile attributional bias and aggressive strategies were consistent in level until approximately ages 6.5 and 7.5, respectively; then they accelerated up to age 12.5. The positive linear and negative curvilinear change in competent interpersonal negotiation strategies revealed a trajectory that peaked at approximately age 10.0 and declined thereafter to age 12.5.

Table 3
Model Estimates for Growth Trajectories of Children's Social-Cognitive Processes

	Unconditional		Demographic		Intervention	
Demographic and intervention variables	β	*SE*	β	*SE*	β	*SE*
Hostile attributional bias						
For average rate at age 8.8						
Intercept	0.452***	0.004	0.443***	0.007	0.450***	0.008
Gender			−0.015***	0.004	−0.016***	0.004
School lunch			0.025***	0.006	0.025***	0.006
Black vs. White			0.040***	0.006	0.039***	0.006
Hispanic vs. White			0.013*	0.006	0.016**	0.007
Classroom instruction (CI)					−0.009**	0.003
Teacher training and coaching (TTC)					0.007*	0.004
CI × TTC					−0.000	0.001
For linear change						
Intercept	0.022***	0.002	0.015***	0.003	0.013***	0.003
Gender			0.001	0.002	0.003	0.002
School lunch			0.008**	0.003	0.008**	0.003
Black vs. White			−0.000	0.003	−0.002	0.003
Hispanic vs. White			−0.006*	0.003	−0.006	0.003
Classroom instruction					−0.007***	0.002
Teacher training and coaching					0.009***	0.002
CI × TTC					0.000	0.000
For curvilinear change						
Intercept	0.005***	0.001	0.008***	0.002	0.008***	0.002
Gender			0.003**	0.001	0.003**	0.001
School lunch			−0.004**	0.002	−0.004**	0.002
Black vs. White			−0.001	0.002	0.000	0.002
Hispanic vs. White			0.001	0.002	0.001	0.002
Classroom instruction					0.001	0.001
Teacher training and coaching					−0.002	0.001
CI × TTC					0.000	0.000
Aggressive INS						
For average rate at age 8.8						
Intercept	0.305***	0.005	0.294***	0.007	0.299***	0.009
Gender			−0.070***	0.005	−0.071***	0.005
School lunch			0.027***	0.007	0.027***	0.007
Black vs. White			0.049***	0.007	0.048***	0.007
Hispanic vs. White			0.005	0.007	0.007	0.007
Classroom instruction (CI)					−0.005	0.003
Teacher training and coaching (TTC)					0.005	0.004
CI × TTC					−0.001	0.001
For linear change						
Intercept	0.026***	0.002	0.022***	0.004	0.018***	0.004
Gender			−0.006**	0.002	−0.006**	0.002
School lunch			0.003	0.003	0.003	0.003
Black vs. White			0.001	0.003	−0.001	0.003
Hispanic vs. White			−0.005	0.003	−0.005	0.003
Classroom instruction					−0.006***	0.002
Teacher training and coaching					0.009***	0.002
CI × TTC					0.000	0.001
For curvilinear change						
Intercept	0.011***	0.001	0.014***	0.002	0.014***	0.002
Gender			0.004***	0.001	0.005***	0.001
School lunch			−0.003	0.002	−0.003	0.002
Black vs. White			−0.000	0.002	0.000	0.002
Hispanic vs. White			0.003	0.002	0.003	0.002
Classroom instruction					0.001	0.001
Teacher training and coaching					−0.002*	0.001
CI × TTC					0.000	0.000

Table 3 (*continued*)

Demographic and intervention variables	Unconditional		Demographic		Intervention	
	β	*SE*	*β*	*SE*	*β*	*SE*
	Competent INS					
For average rate at age 8.8						
Intercept	0.516***	0.003	0.526***	0.005	0.517***	0.006
Gender			0.036***	0.003	0.035***	0.003
School lunch			−0.029***	0.004	−0.030***	0.004
Black vs. White			−0.039***	0.004	−0.039***	0.005
Hispanic vs. White			−0.031***	0.004	−0.036***	0.005
Classroom instruction (CI)					0.013***	0.002
Teacher training and coaching (TTC)					−0.003	0.002
CI × TTC					−0.002**	0.001
For linear change						
Intercept	0.026***	0.001	0.029***	0.002	0.029***	0.002
Gender			0.003*	0.001	0.003**	0.001
School lunch			−0.001	0.002	−0.001	0.002
Black vs. White			−0.000	0.002	0.000	0.002
Hispanic vs. White			0.010***	0.002	0.011***	0.002
Classroom instruction					0.001	0.001
Teacher training and coaching					−0.003**	0.001
CI × TTC					0.000	0.000
For curvilinear change						
Intercept	−0.013***	0.001	−0.014***	0.001	−0.013***	0.001
Gender			−0.002**	0.001	−0.002**	0.001
School lunch			0.002	0.001	0.002	0.001
Black vs. White			0.002*	0.001	0.002*	0.001
Hispanic vs. White			0.001	0.001	0.001	0.001
Classroom instruction					−0.001	0.001
Teacher training and coaching					0.001	0.001
CI × TTC					0.000	0.000

Note. INS = interpersonal negotiation strategies.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Next, a series of models testing differences in children's growth trajectories by gender (girls = 1), school lunch eligibility status (free lunch = 1), and child race/ethnicity (Black = 1, White = −1; Hispanic = 1, White = −1) are reported in Table 3. To assess the unique effects of each demographic variable on children's trajectories independent of intervention status, all demographic variables were tested simultaneously. Demographic differences in trajectories of outcome variables in the domain of children's social-cognitive processes were highly similar. As shown in Table 3 (Demographic column), girls reported significantly lower levels of hostile attribution bias ($t = -3.72$, $p < .001$) and aggressive interpersonal negotiation strategies ($t = -15.57$, $p <$

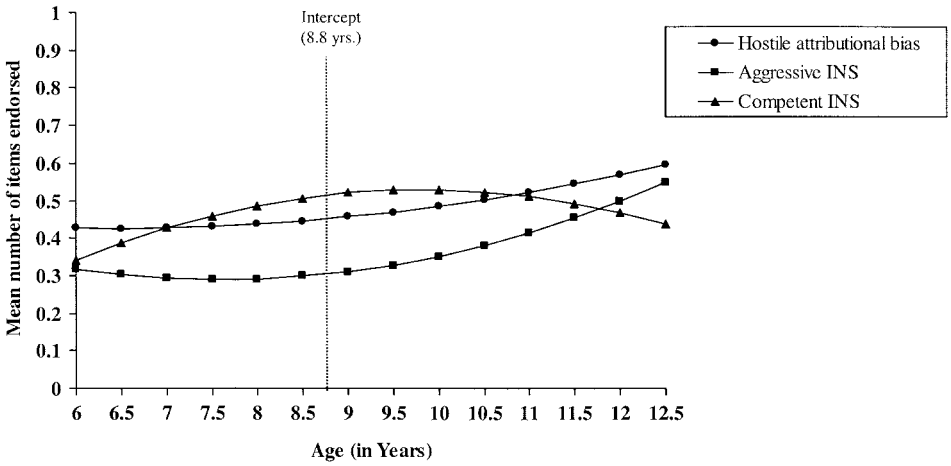

Figure 2. Social-cognitive processes: unconditional growth. INS = interpersonal negotiation strategies.

.001) and significantly higher levels of competent interpersonal negotiation strategies ($t = 12.39$, $p < .001$) than did boys at age 8.8 (intercept). For hostile attribution bias, there were no gender differences for linear change; however, girls accelerated significantly faster than boys ($t = 2.77$, $p < .01$). In addition, compared with boys, girls showed a slower linear increase ($t = -2.87$, $p < .01$) and a faster rate of acceleration ($t = 3.88$, $p < .001$) in their endorsement of aggressive interpersonal negotiation strategies, and they showed a greater linear increase ($t = 2.36$, $p < .05$) and a faster rate of deceleration in their competent interpersonal negotiation strategies ($t = -2.46$, $p < .01$).

To summarize, the primary differences in the shape of the trajectories for girls and boys were consistent across the three outcomes in the social-cognitive developmental domain. Overall, from ages 6.0 to 12.5, girls had lower levels of aggressive and higher levels of competent interpersonal negotiation strategies, and they exceeded boys in levels of hostile attribution bias beginning at age 11.0. In all three outcomes, girls initially declined faster in risk than did boys (i.e., they had faster decreases in hostile attribution bias and aggressive interpersonal negotiation strategies between ages 6.0 and approximately 8.5 and faster increases in competent interpersonal negotiation strategies between ages 6.0 and 10.0). This initial decline in risk for girls was followed by faster increases in risk than were evidenced for boys (i.e., faster increases in hostile attribution bias and aggressive interpersonal negotiation strategies between ages 8.5 and 12.5 and faster decreases in competent interpersonal negotiation strategies between ages 10.0 and 12.5). Said another way, girls initially declined but then caught up to (and exceeded in the case of hostile attribution biases) boys in each of the variables in this domain.

Although the graphic representation of all significant demographic subgroup effects is not possible given space limitations, the general shape of gender differences in growth trajectories across outcomes in this domain is illustrated in Figure 3 for aggressive interpersonal negotiation strategies. Note that some convergence in trajectories at the extremes of the age span is due to the length of the (age) series being predicted, with smaller variances for the intercept, slope, and quadratic effects leading the fitted curves to be "pulled" to the average.

Children who received free school lunches reported significantly higher levels at age 8.8 (intercept) of hostile attribution bias ($t = 3.89$, $p < .001$) and aggressive interpersonal negotiation strategies ($t = 4.01$, $p < .001$) and significantly lower levels of competent interpersonal negotiation strategies ($t = -6.66$, $p < .001$) than did children who received reduced price or full price lunches (see Table 3, Demographic column). Differences in the shape of growth, however, were seen only for trajectories of hostile attribution bias. Children who received free school lunches had a greater linear increase ($t = 2.71$, $p < .01$) and a slower rate of acceleration ($t = -2.64$, $p < .05$) than did children who received reduced price or full price lunches. Compared with children who received reduced or full price lunches, free-lunch-eligible children initially had lower levels of hostile attribution bias (between ages 6.0 and 7.0) followed by higher levels (between ages 7.5 and 12.0) and then lower levels again by age 12.5.

Compared with White children, Black and Hispanic children reported significantly higher levels at age 8.8 (intercept) of hostile attribution biases ($t = 6.18$, $p < .001$, and $t = 2.04$, $p < .05$, respectively) and of aggressive interpersonal negotiation strategies (only Black vs. White was significant; $t = 7.24$, $p < .001$) and significantly lower levels of competent interpersonal negotiation strategies ($t = -8.53$, $p < .001$, and $t = -6.81$, $p < .001$, respectively). For hostile attribution bias, Hispanic children had a slower linear increase than White children ($t = -1.93$, $p < .05$), evidencing higher levels between ages 6.0 and approximately 10.0, after which levels were almost equivalent to those of White children up until age 12.5. Linear differences in hostile attribution bias between Black and White children were not significant, and no race/ethnicity differences in curvilinear change were detected. Further, there were no linear or curvilinear effects of child race/ethnicity on trajectories of aggressive interpersonal negotiation strategies.

For competent interpersonal negotiation strategies, Black and White children showed equivalent levels of linear increase; however, Black children had a slower rate of deceleration than White children ($t = 2.08$, $p < .05$). Overall, from ages 6.0 to 12.5, Black children had lower levels of competent interpersonal negotiation strategies than did White children, and although both showed

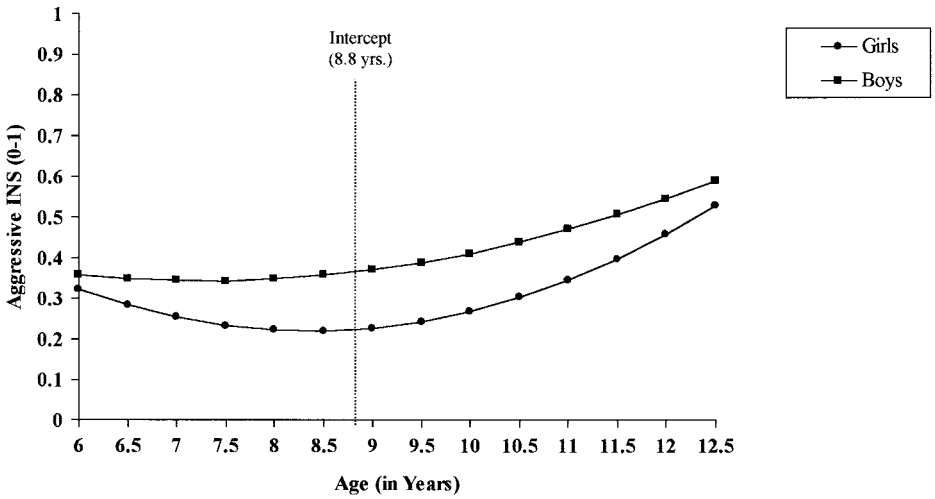

Figure 3. Aggressive interpersonal negotiation strategies: gender. INS = interpersonal negotiation strategies.

initial increases between ages 6.0 and 9.5, followed by declines between ages 9.5 and 12.5, these shifts were slower for Black children, which resulted in almost equivalent levels of risk again by age 12.5. Further, Hispanic children had a greater linear increase in competent strategies than did White children ($t = 5.14$, $p < .001$), evidencing lower levels until age 11.0.

A final series of conditional models simultaneously tested the main and interaction effects of RCCP classroom instruction and teacher training and coaching. It must be noted that because of the co-occurrence of data collection and children's exposure to the RCCP in the fall of Year 1 of the evaluation, significant intercept differences in these conditional intervention models can be interpreted in two ways. First, because some children received the RCCP intervention prior to the age at which we defined the intercept (e.g., those children who were 8.8 years old in Year 2 of the evaluation and as such were likely to have been exposed to the RCCP in Year 1 when they were 1 year younger), significant differences in intercepts may actually reflect "pre-intercept" intervention effects, resulting in differences at age 8.8 that may be due to receipt of the intervention and not to pre-intervention differences. Second, intercept differences may also be related to selection bias associated with features of classroom composition. Specifically, it is possible that classrooms with lower average levels of aggression (i.e., classrooms in which children are more inclined toward positive change) elicit greater amounts of classroom instruction. For both of these reasons, we report, but pay little attention to, the effects of classroom instruction and teacher training and coaching on intercepts. Rather, we focus on how these program components influenced the growth parameters, because these parameters are estimated net of any intercept differences (i.e., pre-intervention differences) and control for possible selection bias.

Classroom instruction and teacher training and coaching in the RCCP had consistent and opposite effects on trajectories of children's social-cognitive processes. Specifically, higher levels of classroom instruction were associated with (a) lower levels of hostile attribution bias ($t = -2.72$, $p < .01$) and higher levels of competent interpersonal negotiation strategies ($t = 5.59$, $p < .001$) at age 8.8 (intercept) and (b) linear decreases in hostile attributional bias ($t = -4.06$, $p < .001$) and aggressive strategies ($t = -3.32$, $p < .001$; see Table 3, Intervention column). Levels of classroom instruction were not associated with linear change in competent interpersonal negotiation strategies or with curvilinear change in any of the three outcomes in this developmental domain.

In contrast, higher levels of teacher training and coaching were significantly associated both with a higher intercept level and with a linear increase in hostile attribution bias ($t = 1.99$, $p < .05$, and $t = 4.67$, $p < .001$, respectively), as well as with a linear decline in competent strategies ($t = -2.48$, $p < .01$; see Table 3). Higher levels of teacher training and coaching were also associated with a greater linear increase ($t = 4.47$, $p < .001$) and a slower rate of acceleration ($t = -2.04$, $p < .05$) in aggressive strategies.

Behavioral symptomatology. The association (tau) between intercept and slope was weak in the unconditional models of the average growth trajectory for children's aggressive fantasies ($\tau = -.04$) and depressive symptoms ($\tau = .03$). This association was positive and moderate in size for the unconditional growth trajectory of conduct problems ($\tau = .49$).

Although the unconditional models for the three outcomes in this domain revealed significant linear change, two of the three were characterized by significant curvilinear change as well (see Table 4, Unconditional column). Specifically, as shown in Figure 4, the average growth trajectory from ages 6.0 to 12.5 for both aggressive fantasies and conduct problems was characterized by positive linear change ($t = 37.72$, $p < .001$, and $t = 13.22$, $p < .001$, respectively) and by significant negative curvilinear change (deceleration) for aggressive fantasies ($t = -2.14$, $p < .05$). The unconditional growth trajectory for depressive symptoms included significant negative linear ($t = -4.08$, $p < .001$) and curvilinear ($t = -3.72$, $p < .001$) change.

Tests of demographic differences in the level and shape of these trajectories revealed that, compared with boys at age 8.8, girls reported significantly lower levels of aggressive fantasies ($t = -8.65$, $p < .001$) and conduct problems ($t = -13.61$, $p < .001$) and significantly higher levels of depressive symptoms ($t = 6.87$, $p < .001$; see Table 4, Demographic column). Girls and boys showed equivalent linear increases in aggressive fantasies and conduct problems. Girls, however, had a slower rate of deceleration than boys in aggressive fantasies ($t = 3.06$, $p < .01$) and were accelerating slightly in conduct problems relative to the deceleration demonstrated by boys ($t = 2.58$, $p < .01$). No gender differences were detected in linear or curvilinear change for depressive symptoms. Thus, although girls had lower levels than boys in aggressive fantasies between ages 6.0 and 11.5, and lower levels of conduct problems between ages 6.0 and 12.5, their slower deceleration in aggressive fantasies and slower acceleration in conduct problems (compared with the deceleration of boys) placed them at greater or almost equal levels of risk, respectively, by age 12.5.

No school lunch differences in intercept, linear, or curvilinear change were detected in aggressive fantasies. Children who received free school lunches reported higher levels of conduct problems ($t = 3.50$, $p < .001$) and depressive symptoms ($t = 5.29$, $p < .001$) at age 8.8 and greater linear increases in conduct problems ($t = 2.75$, $p < .01$) than did children who received reduced price or full price lunches. No significant linear or curvilinear changes in depressive symptoms were found.

Differences in trajectories by child race/ethnicity at age 8.8 (intercept) were detected for each of the three outcomes in this domain (see Table 4, Demographic column). With the exception of the Hispanic versus White comparison for the intercept of aggressive fantasies, compared with White children, Black and Hispanic children had higher age 8.8 levels of aggressive fantasies ($t = 9.09$, $p < .001$, Black only), conduct problems ($t = 6.16$, $p < .001$, and $t = 2.78$, $p < .01$, respectively), and depressive symptoms ($t = 8.84$, $p < .001$, and $t = 7.23$, $p < .001$, respectively). For aggressive fantasies, Black and Hispanic children both had a greater linear increase than White children ($t = 4.35$, $p < .001$, and $t = 2.19$, $p < .05$, respectively); however, Black children had a faster rate of deceleration than White children ($t = -3.23$, $p < .01$). Thus, although Black, Hispanic, and White children had almost equivalent levels of aggressive fantasies at age 6.0 (with Hispanic children slightly lower than Black and White children), both Hispanic and Black children increased at a faster rate than White children such that Hispanic children exceeded the levels of White children at approximately age 8.5 (significant linear change only) and Black children grew and then declined faster than White children, resulting in almost equivalent levels by age 12.5.

Table 4
Model Estimates for Growth Trajectories of Children's Behavioral Symptomatology

	Unconditional		Demographic		Intervention	
Demographic and intervention variables	β	*SE*	β	*SE*	β	*SE*
	Aggressive fantasies					
For average rate at age 8.8						
Intercept	1.926***	0.006	1.937***	0.009	1.931***	0.011
Gender			−0.048***	0.006	−0.049***	0.006
School lunch			0.004	0.009	0.003	0.009
Black vs. White			0.080***	0.009	0.078***	0.009
Hispanic vs. White			0.003	0.009	0.001	0.009
Classroom instruction (CI)					0.003	0.005
Teacher training and coaching (TTC)					0.011*	0.005
CI × TTC					−0.005***	0.001
For linear change						
Intercept	0.097***	0.003	0.098***	0.004	0.092***	0.005
Gender			0.003	0.003	0.003	0.003
School lunch			0.004	0.004	0.003	0.004
Black vs. White			0.017***	0.004	0.015***	0.004
Hispanic vs. White			0.009*	0.004	0.008*	0.004
Classroom instruction					−0.003	0.002
Teacher training & coaching					0.009***	0.002
CI × TTC					−0.001	0.001
For curvilinear change						
Intercept	−0.003*	0.001	−0.006**	0.002	−0.005*	0.003
Gender			0.004**	0.001	0.004**	0.001
School lunch			0.002	0.002	0.002	0.002
Black vs. White			−0.007**	0.002	−0.007**	0.002
Hispanic vs. White			−0.000	0.002	0.001	0.002
Classroom instruction					−0.002	0.001
Teacher training & coaching					−0.001	0.001
CI × TTC					0.001**	0.000
	Conduct problems					
For average rate at age 8.8						
Intercept	1.313***	0.005	1.306***	0.007	1.309***	0.008
Gender			−0.060***	0.004	−0.060***	0.004
School lunch			0.023***	0.007	0.023***	0.007
Black vs. White			0.042***	0.007	0.040***	0.007
Hispanic vs. White			0.019**	0.007	0.019**	0.007
Classroom instruction (CI)					−0.004	0.003
Teacher training and coaching (TTC)					0.007*	0.004
CI × TTC					−0.002*	0.001
For linear change						
Intercept	0.030***	0.002	0.024***	0.004	0.024***	0.004
Gender			−0.003	0.002	−0.004	0.002
School lunch			0.009**	0.003	0.009**	0.003
Black vs. White			0.003	0.003	0.003	0.003
Hispanic vs. White			−0.000	0.003	0.001	0.003
Classroom instruction					−0.006**	0.002
Teacher training and coaching					0.006**	0.002
CI × TTC					0.000	0.001
For curvilinear change						
Intercept	−0.001	0.001	−0.001	0.002	−0.003	0.002
Gender			0.003**	0.001	0.003**	0.001
School lunch			−0.001	0.002	−0.001	0.002
Black vs. White			−0.004	0.002	−0.004*	0.002
Hispanic vs. White			−0.002	0.002	−0.002	0.002
Classroom instruction					0.001	0.001
Teacher training and coaching					−0.001	0.001
CI × TTC					0.000	0.000

Table 4 (*continued*)

Demographic and intervention variables	Unconditional		Demographic		Intervention	
	β	*SE*	*β*	*SE*	*β*	*SE*
	Depressive symptoms					
For average rate at age 8.8						
Intercept	1.508***	0.005	1.501***	0.007	1.500***	0.009
Gender			0.031***	0.004	0.030***	0.004
School lunch			0.036***	0.007	0.036***	0.007
Black vs. White			0.063***	0.007	0.062***	0.007
Hispanic vs. White			0.052***	0.007	0.049***	0.007
Classroom instruction (CI)					0.009**	0.003
Teacher training and coaching (TTC)					−0.003	0.004
CI × TTC					−0.003**	0.001
For linear change						
Intercept	−0.010***	0.002	−0.008*	0.004	−0.008	0.005
Gender			0.001	0.002	0.001	0.002
School lunch			0.002	0.004	0.001	0.004
Black vs. White			0.012***	0.004	0.011**	0.004
Hispanic vs. White			0.008*	0.004	0.007	0.004
Classroom instruction					0.002	0.002
Teacher training and coaching					0.001	0.002
CI × TTC					−0.001	0.001
For curvilinear change						
Intercept	−0.005***	0.001	−0.003	0.002	−0.003	0.003
Gender			0.001	0.001	0.001	0.001
School lunch			−0.003	0.002	−0.003	0.002
Black vs. White			−0.005*	0.002	−0.005*	0.002
Hispanic vs. White			−0.000	0.002	0.001	0.002
Classroom instruction					−0.004**	0.001
Teacher training and coaching					0.003**	0.001
CI × TTC					0.000	0.000

* $p < .05$. ** $p < .01$. *** $p < .001$.

No significant child race/ethnicity differences in linear or curvilinear change were detected in the growth trajectory of conduct problems. For depressive symptoms, Black children had a slight linear increase compared with the linear decline evidenced by White children ($t = 3.42$, $p < .001$), although the rate of deceleration for Black children was faster ($t = -2.34$, $p < .05$). Hispanic children had a slower linear decline in depressive symptoms than did White children ($t = 2.11$, $p < .05$). Thus, Black and Hispanic children had higher overall levels of depressive symptoms than did White children between ages 6.0 and 12.5, and although there was a slower rate of decline for Hispanic (linear change only) and Black children (deceleration), both remained at

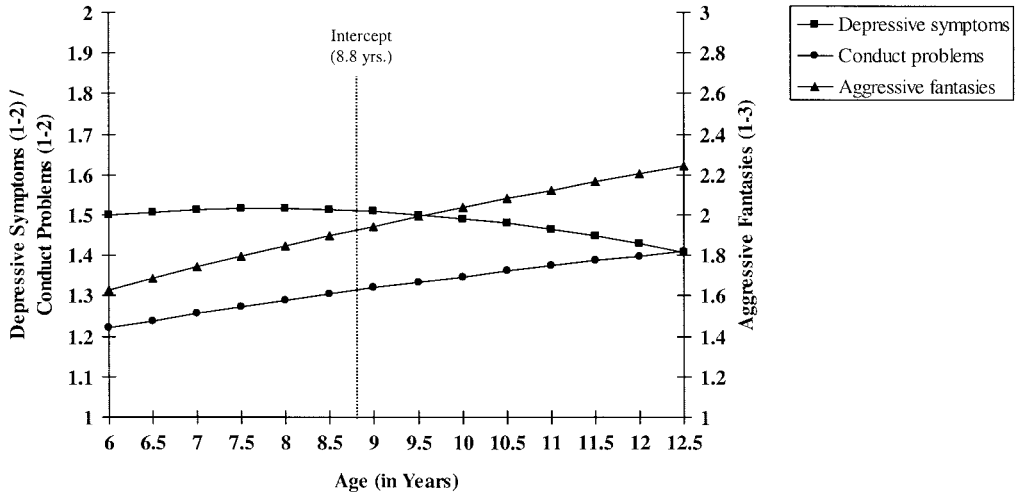

Figure 4. Behavioral symptomatology: unconditional growth.

higher risk of depressive symptoms by age 12.5 than did White children.

Conditional models testing the effects of exposure to the RCCP again demonstrated significant differences in both the level and shape of the trajectories of children's behavioral symptomatology (see Table 4, Intervention column). Unlike in the previous domain, the overall effect of the RCCP intervention on the level and shape of the trajectories of the three outcomes in this domain differed slightly across variables. Specifically, the relationships between the two intervention variables and linear change in conduct problems and depressive symptoms were characterized by main effects (i.e., no significant interactions). For conduct problems, higher levels of classroom instruction were associated with a linear decline over the course of the trajectory, whereas higher levels of teacher training and coaching were related to a linear increase. In contrast, the association between intervention and depressive symptoms was exclusively curvilinear in nature, such that higher levels of classroom instruction were associated with a slower rate of acceleration in depressive symptoms across the age trajectory ($t = -3.19$, $p < .01$), and higher levels of teacher training and coaching were associated with a faster rate of acceleration ($t = 2.46$, $p < .01$). Finally, there was a significant interaction of classroom instruction with teacher training and coaching on the intercept and curvilinear change of aggressive fantasies ($t = -3.52$, $p < .001$, and $t = 2.75$, $p < .01$, respectively).

To graphically represent this interaction, we used a standard procedure for plotting regression estimates. Specifically, parameter estimates resulting from the intervention model and combinations of values for classroom instruction and teacher training and coaching were used to predict age-based change in outcome. Values for the intervention components were selected on the basis of earlier results that identified significant associations between empirically derived profiles of RCCP intervention and changes in child outcomes from the fall to the spring of Year 1 (see Aber et al., 1998). Three combinations of the intervention components (described in the Method section) are depicted: (a) children who received two standard deviations above the mean in classroom instruction and whose teachers received the mean level of teacher training and coaching (high lessons), (b) children who received the mean level of classroom instruction and whose teachers received two standard deviations above the mean in teacher training and coaching (high training and coaching), and (c) children who received no RCCP classroom instruction and whose teachers received no RCCP teacher training and coaching (no RCCP intervention).

As shown in Figure 5, children receiving higher levels of classroom instruction relative to teacher training and coaching (high lessons) had a slower rate of acceleration in aggressive fantasies than did children receiving higher levels of teacher training and coaching relative to classroom instruction (high training and coaching).

Teacher perceptions of child behavior. The unconditional models of the average growth trajectories for teacher-reported aggressive behavior and prosocial behavior demonstrated low to moderate positive associations (tau) between intercepts and rates of change for each outcome ($\tau = .16$ and .20, respectively).

Both unconditional models were characterized by significant linear and curvilinear change over time (see Table 5, Unconditional column). Specifically, from ages 6.0 to 12.5, the average growth trajectory of teacher-reported aggressive behavior revealed positive linear change ($t = 11.61$, $p < .001$) and negative curvilinear change (deceleration; $t = -9.46$, $p < .001$) whereas the growth trajectory for teacher-reported prosocial behavior was marked by positive linear change ($t = 11.84$, $p < .001$) and positive curvilinear change (acceleration; $t = 10.07$, $p < .001$). As shown in Figure 6, the trajectory of teacher-reported aggressive behavior peaked at approximately age 10.0 and then declined up to age 12.5. The average trajectory for teacher-reported prosocial behavior reached its lowest point at approximately age 7.5 and then increased up to age 12.5.

Girls were reported by teachers as significantly lower in aggressive behavior ($t = -16.22$, $p < .001$) and higher in prosocial behavior ($t = 18.18$, $p < .001$) than boys at age 8.8 (intercept; see Table 5, Demographic column). Although there were no signifi-

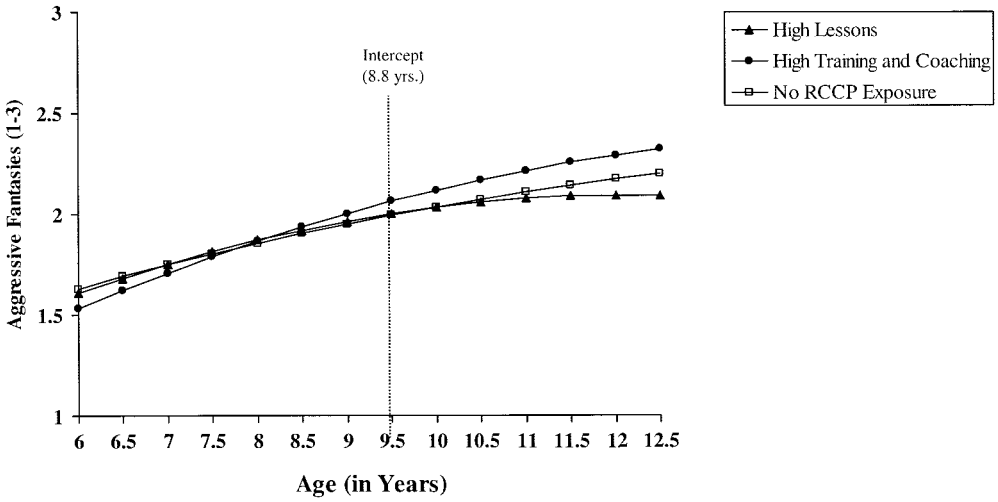

Figure 5. Aggressive fantasies: effects of Year 1 and Year 2 classroom instruction and teacher training and coaching. RCCP = Resolving Conflict Creatively Program.

Table 5
Model Estimates for Growth Trajectories of Teacher Perceptions of Child Behavior

	Unconditional		Demographic		Intervention	
Demographic and intervention variables	β	*SE*	β	*SE*	β	*SE*
Aggressive behavior						
For average rate at age 8.8						
Intercept	2.245***	0.014	2.199***	0.020	2.207***	0.024
Gender			−0.217***	0.013	−0.218***	0.013
School lunch			0.148***	0.018	0.149***	0.018
Black vs. White			0.272***	0.019	0.267***	0.019
Hispanic vs. White			0.103***	0.019	0.105***	0.019
Classroom instruction (CI)					−0.021*	0.011
Teacher training and coaching (TTC)					0.024*	0.012
CI × TTC					−0.002	0.003
For linear change						
Intercept	0.071***	0.006	0.064***	0.009	0.094***	0.010
Gender			−0.011	0.006	−0.012*	0.006
School lunch			0.019*	0.008	0.017*	0.008
Black vs. White			0.017*	0.009	0.016	0.009
Hispanic vs. White			0.031***	0.008	0.034***	0.008
Classroom instruction					−0.012*	0.005
Teacher training and coaching					0.010	0.006
CI × TTC					−0.006***	0.001
For curvilinear change						
Intercept	−0.031***	0.003	−0.032***	0.005	−0.029***	0.006
Gender			−0.002	0.003	−0.002	0.003
School lunch			−0.006	0.005	−0.006	0.004
Black vs. White			−0.017***	0.005	−0.019***	0.005
Hispanic vs. White			−0.011*	0.005	−0.012**	0.005
Classroom instruction					0.000	0.003
Teacher training and coaching					−0.007*	0.003
CI × TTC					0.001	0.001
Prosocial behavior						
For average rate at age 8.8						
Intercept	3.225***	0.013	3.272***	0.020	3.260***	0.023
Gender			0.218***	0.012	0.220***	0.012
School lunch			−0.133***	0.018	−0.134***	0.018
Black vs. White			−0.211***	0.018	−0.207***	0.018
Hispanic vs. White			−0.093***	0.018	−0.099***	0.019
Classroom instruction (CI)					0.033***	0.010
Teacher training and coaching (TTC)					−0.016	0.010
CI × TTC					−0.005*	0.003
For linear change						
Intercept	0.068***	0.006	0.066***	0.009	0.020*	0.010
Gender			0.029***	0.005	0.030***	0.005
School lunch			−0.013	0.008	−0.011	0.008
Black vs. White			−0.022**	0.008	−0.025**	0.008
Hispanic vs. White			−0.001	0.008	−0.008	0.008
Classroom instruction					0.025***	0.005
Teacher training and coaching					−0.014**	0.005
CI × TTC					0.006***	0.001
For curvilinear change						
Intercept	0.031***	0.003	0.031***	0.005	0.030***	0.006
Gender			−0.000	0.003	−0.001	0.003
School lunch			0.000	0.005	0.000	0.005
Black vs. White			0.005	0.005	0.008	0.005
Hispanic vs. White			−0.001	0.005	0.002	0.005
Classroom instruction					−0.007**	0.003
Teacher training and coaching					0.009**	0.003
CI × TTC					0.000	0.001

* $p < .05$. ** $p < .01$. *** $p < .001$.

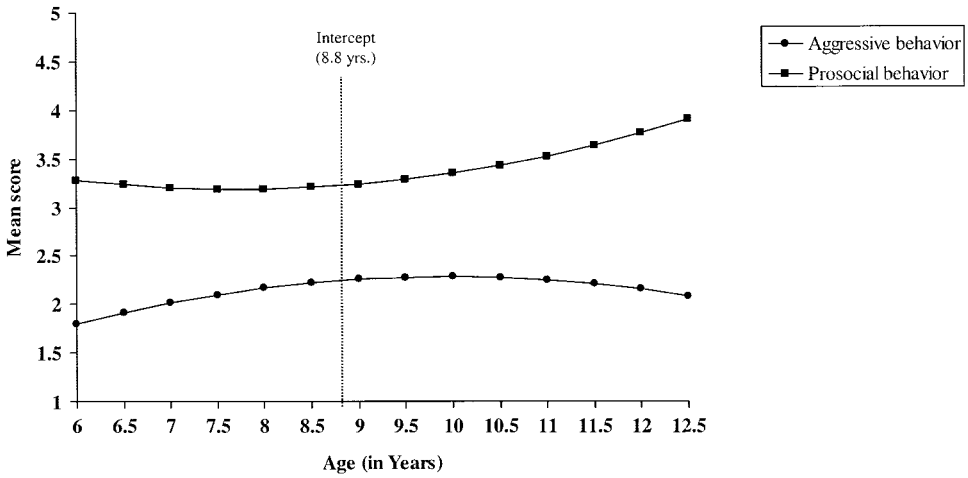

Figure 6. Teacher perceptions of child behavior: unconditional growth.

cant gender differences in linear or curvilinear change for teacher-reported aggressive behavior, girls demonstrated a greater linear increase in trajectories of prosocial behavior than did boys ($t = 5.26$, $p < .001$).

Children who received free school lunches were reported by teachers as more aggressive ($t = 8.18$, $p < .001$) and less prosocial ($t = -7.21$, $p < .001$) at age 8.8 than were children who received reduced price or full price lunches. Further, for aggressive behavior, free lunch recipients had a greater linear increase than did children who received reduced or full price lunches ($t = 2.33$, $p < .05$). No linear or curvilinear differences based on school lunch status were detected in children's trajectories of prosocial behavior.

Significant differences by child race/ethnicity were found in the level and shape of the trajectories of teacher-reported aggressive and prosocial behavior (see Table 5, Demographic column). Specifically, compared with White children, Black and Hispanic children at age 8.8 (intercept) were reported by teachers as having significantly higher levels of aggressive behavior ($t = 14.15$, $p < .001$, and $t = 5.42$, $p < .001$, respectively) and lower levels of prosocial behavior ($t = -11.59$, $p < .001$, and $t = -5.09$, $p < .001$, respectively). Further, compared with White children, Black and Hispanic children were reported to have greater linear increases ($t = 1.94$, $p < .05$, and $t = 3.72$, $p < .001$, respectively) and faster rates of deceleration ($t = -3.48$, $p < .001$, and $t = -2.19$, $p < .05$, respectively) in teacher ratings of aggressive behavior. Finally, Black children had a significantly slower linear increase than White children in teacher-reported prosocial behavior ($t = -2.61$, $p < .01$). Thus, while levels of overall risk between ages 6.0 and 12.5 were greater for Black and Hispanic children than for White children (i.e., Black and Hispanic children had higher levels of aggressive behavior and lower levels of prosocial behavior), Black and Hispanic children's initial increase in aggressive behavior until approximately age 9.5 (for Black) or 10.5 (for Hispanic) was followed by a decrease that placed them at levels of risk almost equivalent to those of White children by age 12.5. Black children appeared to maintain their slower rate of increase (linear only) in teacher-reported prosocial behavior from ages 6.0 to 12.5 compared with White children, although the increase for Hispanic children did not differ significantly from that for White children.

RCCP intervention effects on teacher perceptions of children's aggressive and prosocial behavior were characterized both by main effects and interactions (see Table 5, Intervention column). For both aggressive and prosocial behavior, there was a significant impact of teacher training and coaching on curvilinear change, with higher levels of teacher training and coaching associated with a slower rate of acceleration in aggressive behavior ($t = -2.21$, $p < .05$) and a faster rate of acceleration in prosocial behavior ($t = 2.98$, $p < .01$). In contrast, classroom instruction was associated with a slower rate of acceleration in prosocial behavior ($t = -2.61$, $p < .01$). Interactions of classroom instruction with teacher training and coaching were also associated with linear change in aggressive behavior ($t = -4.50$, $p < .001$) and prosocial behavior ($t = 4.90$, $p < .001$). Note that because the interaction effects on curvilinear change were nonsignificant, the linear interaction is graphed and described in Figure 7 for both variables.

As shown in Figure 7, children who received higher levels of classroom instruction relative to teacher training and coaching (high lessons) were reported by teachers as generally consistent in levels of aggressive behavior between ages 6.0 and 12.5 compared with children who received higher levels of teacher training and coaching relative to classroom instruction (high training and coaching), who were reported as steadily increasing in aggressive behavior during this period. Similarly, as depicted in Figure 8, "high lessons" children steadily increased in teacher-reported prosocial behavior from ages 6.0 to 12.5, whereas "high training and coaching" children declined slightly in such behavior during the same period. For both outcomes, the estimated trajectories for "high training and coaching" children more closely resembled the trajectories for children receiving no intervention.

Post Hoc Analyses

We conducted a series of post hoc analyses to (a) examine variation in intervention effects across demographic subgroups; (b) estimate the proportion of reduction in variance across unconditional, demographic, and intervention models; (c) demonstrate the

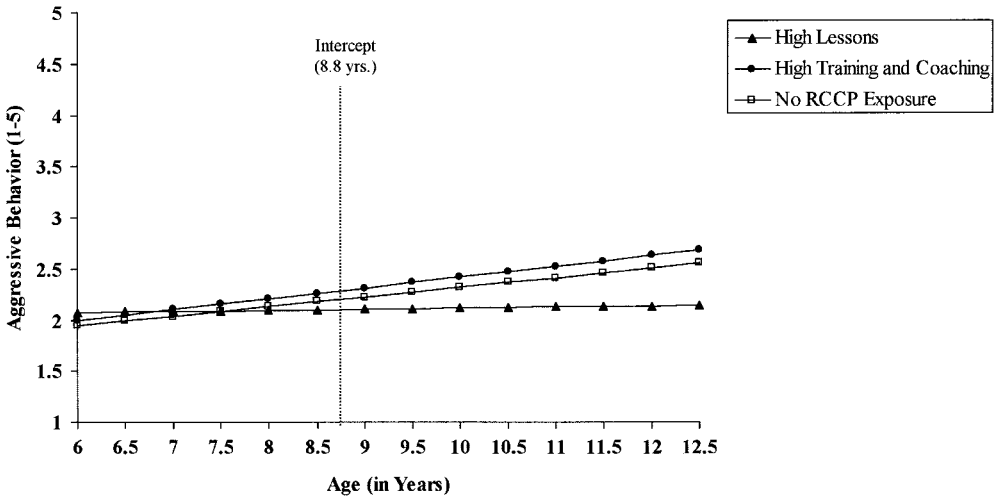

Figure 7. Teacher-reported aggressive behavior: effects of Year 1 and Year 2 classroom instruction and teacher training and coaching. RCCP = Resolving Conflict Creatively Program.

importance of testing variation in "dosages" of the RCCP as opposed to testing only intervention versus no intervention; and (d) address the rival hypothesis that it is children's trajectories of social-cognitive and behavioral risk that elicit different amounts of RCCP implementation by teachers and not the reverse.

First, we tested the robustness of the main effects of classroom instruction and of teacher training and coaching on trajectories of social-emotional development across demographic subgroups. A total of 88 interactions of demographic characteristics with intervention variables were examined for moderator effects. Of these 88 tests, 77 had no significant effect on intercept, and 68 had no significant effect on linear change. Interactions with gender or family socioeconomic status (school lunch eligibility) were negligible and not above a rate expected by chance. Significant interaction effects for race/ethnicity were few and weak and lacked a discernible pattern. A full description of significant moderator effects is available from J. Lawrence Aber upon request.

Second, to obtain a reasonable estimate of the proportion of reduction in variance or, loosely speaking, the variance explained by the Level 2 predictors (Bryk & Raudenbush, 1992, p. 65), we compared the variance estimates of the intercept, linear, and curvilinear components of the final model (i.e., in which all demographic and RCCP intervention variables were included) with those, respectively, of the unconditional model. The proportion of variance in the intercepts explained by the combination of demographic and intervention variables ranged from 4% (hostile attribution bias) to 17% (teacher-reported prosocial behavior), with an average of approximately 11%. The proportion of variance in linear changes explained by the combination of demographic and intervention variables ranged from 0 to 24% (teacher-reported

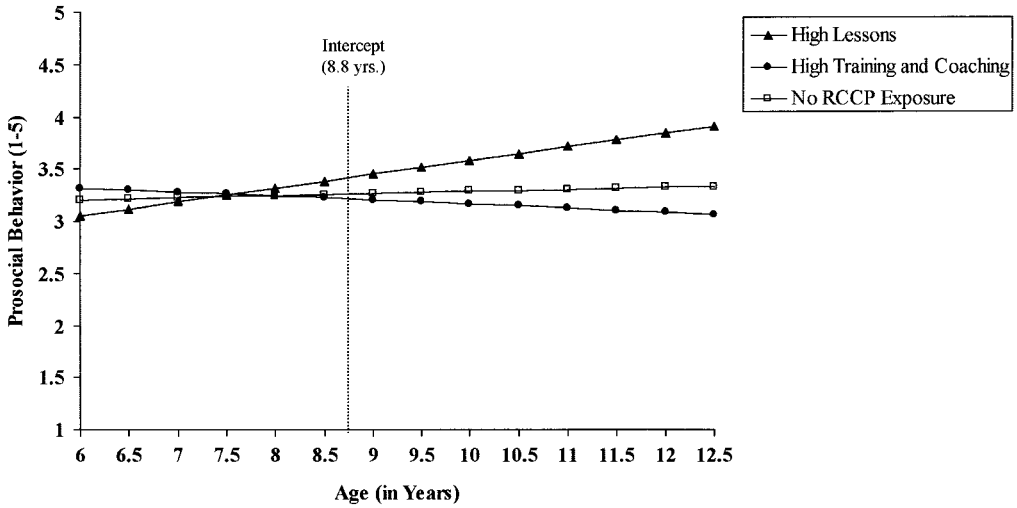

Figure 8. Teacher-reported prosocial behavior: effects of Year 1 and Year 2 classroom instruction and teacher training and coaching. RCCP = Resolving Conflict Creatively Program.

prosocial behavior), with an average of approximately 6%. The proportion of variance in curvilinear changes explained by demographic and intervention variables ranged from 0 to 33% (depressive symptoms), with an average of approximately 9%. On average, the RCCP intervention variables accounted for approximately the same amount of variance in the level and rate of change in children's growth trajectories as did the child demographic characteristics.

Third, in order to ensure that the intervention effects were not a function of whether children received any intervention or no intervention but instead were a function of how much intervention they received, we contrast coded the two intervention variables into (a) no intervention versus any intervention and (b) within any intervention, high (above the median) versus low (below the median). These contrasts were included in Level 2 of the HLM models predicting each target outcome. The results were completely consistent with the findings described above.

Finally, the results raise an alternative hypothesis regarding the impact of RCCP exposure on children's developmental trajectories. Specifically, the results may be interpreted as indicating that children's social-cognitive processes, behavioral symptomatology, and teacher-reported behaviors were eliciting different behavioral responses from teachers regarding their implementation of the RCCP (e.g., the association between the intercepts and slopes for hostile attribution bias might suggest that highly motivated children who were given to more positive development prompted teachers to provide more classroom instruction). To address this alternative interpretation, we conducted post hoc analyses to examine the associations between Year 1 to Year 2 changes in classroom composition (i.e., change from Year 1 to Year 2 in classroom-aggregated outcome scores) and Year 1 to Year 2 changes in teacher participation in and delivery of the RCCP. All correlations were nonsignificant, indicating that changes in the extent to which teachers were trained and coached and then implemented the RCCP in their classrooms were not related to changes in overall levels of "risk" in their classrooms.

Summary

Although unconditional growth trajectories appear to be characterized by somewhat different patterns of linear and quadratic change depending on the outcome under investigation, between approximately 8 and 9 years of age, a general shift was observed in most of the outcomes targeted in this study. Regarding children's social-cognitive processes, this age marked a shift toward increasing levels of the social-cognitive processes that place children at risk for future aggression and violence. Conversely, regarding teacher perceptions of child behavior, this age marked a shift toward decreasing levels of aggressive behavior and increasing levels of prosocial behavior as observed by teachers.

For each of the outcomes across the three domains of development (with the exception of depressive symptoms), girls had lower levels of risk at age 8.8 (intercept) than did boys. In six of eight outcomes, significant gender differences in linear and/or curvilinear change were observed. For five of these outcomes (hostile attribution bias, both aggressive and competent interpersonal negotiation strategies, aggressive fantasies, and conduct problems), although girls were generally at lower levels of risk between ages 6.0 and 12.5, their rate of curvilinear change resulted in an initial decline followed by an increase, which by age 12.5 placed them at levels of risk almost equivalent to (and in the case of hostile attribution bias and aggressive fantasies, levels of risk slightly greater than) those of boys (see Figure 3). This effect of girls catching up in degree of social-cognitive and behavioral risk was not evident for teacher-reported prosocial behavior, where the advantage observed for girls increased steadily from ages 6.0 to 12.5.

School lunch eligibility differences in children's developmental trajectories indicated that children receiving free school lunches had higher intercept levels of risk than did children receiving reduced price or full price lunches for all outcomes with the exception of aggressive fantasies (intercept *ns*). Differences in the shape of growth were detected for three outcomes. In the case of hostile attribution bias, children who received free lunches had a lower level of risk between ages 6.0 and 7.0 than did those who received reduced or full price lunches, but they then had higher levels of risk until approximately age 12.5, when children receiving reduced and full price lunches caught up with them. Regarding conduct problems and teacher-reported aggressive behavior, children who received free lunches had a consistently greater increase in risk (i.e., a greater linear increase) from ages 6.0 to 12.5 than did children who received reduced or full price lunches.

Race/ethnicity differences in outcome trajectories varied on the basis of subgroup comparisons and source of report. Across all outcome variables, Black and Hispanic children were at higher risk at age 8.8 (intercept) than were White children (with the exception of Hispanic vs. White differences in intercept for aggressive fantasies, which were nonsignificant). For four of the five outcomes in which curvilinear differences were found in trajectories for Black children compared with White children (competent interpersonal negotiation strategies, aggressive fantasies, depressive symptoms, and teacher-reported aggressive behavior), Black children were generally at greater risk across the age range of study but decelerated to levels of risk almost equivalent to those of White children by age 12.5. For teacher-reported prosocial behavior, Black children evidenced a consistently slower linear increase than White children from ages 6.0 to 12.5.

In comparison, Hispanic children evidenced slower growth in risk over time than White children in three outcomes (slower linear increases in hostile attribution bias and depressive symptoms and a faster linear increase in competent interpersonal negotiation strategies), greater linear risk than White children in aggressive fantasies (reaching higher levels by age 8.5), and greater risk overall than White children for teacher-reported aggressive behavior but at a rate that was slowing in comparison to that of White children by age 12.5.

Also consistent across outcome measures were the effects of the RCCP intervention components on children's growth trajectories. Higher levels of exposure to classroom instruction in the RCCP and lower levels of exposure to teacher training and coaching were related to significant reductions in risk as defined by (a) social-cognitive processes—specifically, hostile attribution bias, aggressive interpersonal negotiation strategies, and competent interpersonal negotiation strategies (but only for teacher training and coaching) and (b) behavioral symptomatology—specifically, conduct problems (linear main effects), depression (curvilinear main effects), and aggressive fantasies, which revealed that exposure to higher levels of classroom instruction relative to levels of teacher

training and coaching (high lessons) was associated with a slower rate of acceleration. This last finding is consistent with the interactions reported for linear changes in teacher perceptions of child aggressive and prosocial behavior. Again, higher levels of classroom instruction relative to levels of teacher training and coaching (high lessons) were associated with relatively consistent levels of aggressive behavior and increases in prosocial behavior from ages 6.0 to 12.5.

Last, a set of post hoc analyses revealed (a) that intervention effects were for the most part robust across demographic subgroups; (b) that the proportions of variance in the intercepts, linear changes, and curvilinear changes explained by the combination of demographic and intervention variables (over and above the unconditional models) were, on average, 11%, 6%, and 9%, respectively (moreover, the RCCP intervention variables accounted for approximately the same amount of variance in the level and rate of change in children's growth trajectories as did the child demographic characteristics); (c) that testing intervention dosage was critical to detecting the observed intervention effects; and (d) that an alternative hypothesis concerning the direction of effects—namely, that children's trajectories of social-cognitive and behavioral risk elicited the variation in teachers' implementation of the RCCP—was not supported.

Discussion

Middle childhood is an important period of life, and elementary schools are an important setting for the prevention of youth violence (Clayton et al., 2001; Howard, Flora, & Griffin, 1999). Key aspects of development that mediate the influence of early risk on later aggression and violence emerge (e.g., failure to succeed in school, relations with deviant peers) or are consolidated (e.g., beliefs about aggression, information-processing bias) during these years. Nearly all children in the United States enter school and so are exposed to numerous new adults and peers (some of whom may be quite aggressive). Thus, for both internal developmental and external environmental reasons, middle childhood may prove to be an influential period on the pathway to youth violence. In this study, we examined several features of elementary school children's social-emotional developmental trajectories toward violence. Specifically, we examined growth in three domains of social-emotional development that prior research had suggested predict future aggression and violence: teacher perceptions of child behavior, children's reports of their own behavioral symptomatology, and perhaps most important, social-cognitive processes (specifically, children's hostile attribution bias and interpersonal negotiation strategies in hypothetical provocative situations). We set out to answer three questions not previously addressed about the course of these trajectories over middle childhood: (a) What form do children's social-emotional developmental trajectories toward violence take during the elementary school years? (b) Do the forms of the trajectories differ for demographic subgroups of children (defined by gender, family economic resources, and race/ethnicity)? (c) How responsive are the trajectories to a universal, school-based preventive intervention (the RCCP)? In the next sections, we discuss the major results for each of these three questions, highlighting both the limitations of the current study and the implications of the findings for theory, practice, and future research.

The Course of Developmental Trajectories

By employing an accelerated longitudinal (cross-sequential) design (see Figure 1) and by using hierarchical linear modeling to analyze four waves of purposefully incomplete data on first- to sixth-grade children, we were able to create synthetic growth curves of social-emotional development for a highly representative sample of New York City public elementary school children (see Figures 2, 4, and 6). Whether they were due to underlying developmental processes, environmental influences, or the artifact of measurement, we observed three patterns of unconditional growth across the eight measures of social-emotional development that we used. *Late acceleration* (positive curvilinear change) characterized the growth patterns for hostile attribution bias, aggressive interpersonal negotiation strategies, and teacher ratings of prosocial behavior. *Steady increase* (positive linear change) characterized the growth patterns for children's reports of their conduct problems, and *gradual deceleration* (negative curvilinear change) best characterized children's trajectories in competent interpersonal negotiation strategies, teachers' reports of aggressive behavior, and child-reported aggressive fantasies and depressive symptoms.

For the late acceleration and gradual deceleration patterns of growth, it appears that some time between 8 and 9 years of age, children on average experience a period of pronounced acceleration (e.g., in hostile attribution bias) or deceleration (e.g., in competent interpersonal negotiation strategies). However, it should be remembered that the unconditional growth models described above represent average growth trajectories for this population of primarily low-income, racially and ethnically diverse, urban children. There is enormous individual child variation in growth around these average curves. Some of this variation is accounted for later in analyses that include demographic and intervention effects on trajectories. However, considerable individual variation remains unexplained and is probably due to unmeasured variation in the quality of parenting, the influence of peers, neighborhoods, temperament, and other factors known to place children at risk for aggression and violence.

A number of questions for future research are raised by these findings on the basic course of growth in these domains of social-emotional development. Would growth curves take the same form for samples of middle-class and/or suburban or rural children? What accounts for the pronounced change in the course of growth at about age 8.5 across a number of constructs and across several sources of data? Eron (1990), who studied the development of aggression for 30 years, came to the conclusion that aggressive tendencies crystallize at about 8 years of age. Why do children's self-reported social-cognitive processes appear to increase in risk after age 8.5, whereas teachers' perceptions of children's aggressive and prosocial behaviors decline in risk in the same period? Perhaps teachers' expectations of what behaviors are developmentally appropriate change faster than children's actual aggressive and prosocial behaviors, partly accounting for declines in teacher-reported risk by child age. Do periods of rapid acceleration or deceleration in growth represent sensitive periods during which efforts to change the course of development may prove especially efficacious? Conceptualizing children's trajectories toward violence in terms of growth in processes that mediate between early risk and future aggression and violence affords new ways to

approach both the formulation and evaluation of prevention efforts.

Demographic Differences in Developmental Trajectories

Moving beyond unconditional growth models, what have we learned about how children's developmental trajectories toward violence vary by key demographic characteristics? Interestingly, the shapes of these trajectories (steady increase, late acceleration, gradual deceleration) were nearly identical for subgroups of children defined by their gender, family economic resources (as measured by eligibility for free school lunches), and race/ethnicity. What varied by demographic subgroups were the intercepts and the rates of linear and/or curvilinear changes observed at particular ages. In general, the subgroups of children who were found in previous research to score higher on measures of aggression—boys, lower income children, and racial/ethnic minority children—demonstrated both higher initial levels of risk (intercepts) and higher rates of linear growth over the age range of our study, specifically from 6.0 to 12.5 years of age. For several outcomes, lower risk children—girls, higher income children, and White children—caught up to the higher risk children by age 12 (as in Figure 3).

These findings demonstrate the sensitivity of growth curves to what Bronfenbrenner (1979) referred to as children's social address, and they extend prior research on demographic differences in levels to differences in rates of growth. Consequently, they allow us to theorize more specifically about what accounts for similarities across demographic subgroups in the overall shape of change as well as differences in levels and rates of change. For example, biological and cognitive changes associated with preadolescence may determine the shape of the trajectories, but differences in family, school, and neighborhood contexts and experiences may determine differences in levels and rates of change. Finally, these results clearly indicate that among children from poor, diverse, urban elementary schools, there are important within-group differences in trajectories toward violence.

Response of Developmental Trajectories to a Preventive Intervention

The results of the effects of classroom instruction and of teacher training and coaching in the RCCP's curriculum are, from the perspective of prevention science, the most noteworthy. In a recent review of promising and effective violence prevention programs for elementary school children, Clayton et al. (2001) suggested that more holistic and comprehensive interventions appear to have effects across a greater number of outcome domains. They also classified the RCCP among the most holistic and comprehensive interventions. Consistent with the Clayton et al. review, with the RCCP's program theory, and with our hypotheses were our findings that children whose teachers taught more lessons in creative conflict resolution demonstrated (a) slower rates of growth in hostile attribution bias, aggressive interpersonal negotiation strategies, self-reported conduct problems, and depressive symptoms, as well as aggressive fantasies and teacher-reported aggressive behavior (but only when combined with relatively lower levels of teacher training and coaching) and (b) faster rates of growth in teacher-reported prosocial behavior (again, only when combined with lower amounts of teacher training and coaching). Thus, for two of three measures of social-cognitive processes, for both measures of teacher-reported behavior, and for all three child-report measures of behavioral symptomatology, receipt of more lessons in the RCCP had the predicted advantageous effect on children's social-emotional developmental trajectories.

However, as suggested by our earlier findings (Aber et al., 1998), children whose teachers received relatively higher amounts of training and coaching in the creative conflict resolution curriculum demonstrated (a) faster rates of growth in hostile attribution bias, aggressive interpersonal negotiation strategies, self-reported aggressive fantasies, conduct problems, depressive symptoms, and teacher-reported aggressive behavior (but only when combined with relatively lower levels of classroom instruction) and (b) a slower rate of growth in competent interpersonal negotiation strategies and teacher-reported prosocial behavior (but again, only when combined with lower levels of classroom instruction).

Although the findings regarding high teacher training and coaching may seem counterintuitive at first, we believe they may be interpreted as follows. As noted earlier, classroom instruction and teacher training and coaching are positively correlated ($r = .80$ for the sample as a whole; $r = .40$ for children of teachers who participated in the RCCP). When estimated together, the teacher training and coaching effect controls for the classroom instruction effect, measuring the amount of training and coaching a teacher receives *over and above* that which is correlated with the amount of RCCP instruction they deliver in the classroom. As described in an earlier article (Aber et al., 1998), we therefore interpret the effects of this high training and coaching residual score as indexing teachers whom staff developers perceived as needing additional help and support in professional development, in part because they were not delivering the intended amount of classroom instruction. If our interpretation is correct, then this residualized teacher training and coaching score is a measure of need for teacher training and coaching, not of amount of teacher training and coaching. Only future research will be able to confirm or refute this interpretation.

Because the emerging literature on the evaluation of school-based violence prevention programs clearly suggests that more and better-quality teacher training should lead to a greater impact on children's development (Clayton et al., 2001; Thornton, Craft, Dahlberg, Lynch, & Baer, 2000), the findings reported here on teacher training and coaching take on particular significance. Future research should examine nonlinear and threshold effects in the relationship between the amount of teacher training and coaching and children's developmental trajectories toward violence. Most important, because teachers vary greatly in their own levels of social-emotional development and hence their needs for professional development (Adalbjarnardottir, 1999; Adalbjarnardottir & Selman, 1997), future studies should examine how both type and amount of teacher training interact with teachers' own professional needs and development in influencing the course of children's development.

Two other features of the findings regarding children's response to intervention are important to note. First, the effects of high lessons and high training and coaching were quite robust across child gender and family economic resources (as indexed by eligibility for free school lunches), and the interaction effects identified for race/ethnicity were few and inconsistent. Together these find-

ings support the conclusion that the RCCP has essentially the same impact on boys and girls, on children who are income eligible to receive free compared with reduced price and full price school lunches, and on children from different racial/ethnic subgroups. There is considerable theoretical and practical debate over the value of and need for culture-specific violence prevention strategies. Potter and Mercy (1997) stated, "We . . . have little information on how interventions can be adapted for particular community values, cultures and standards and, at the same time, allow for . . . racially and culturally diverse participation from all segments of the community" (p. 5). The results of the present study suggest that a common curriculum can be sensitively and effectively implemented in a manner that benefits children from a diverse range of socioeconomic and racial/cultural backgrounds.

Second, the three demographic variables and the two RCCP implementation variables together accounted for only a small percentage of the variation in children's growth trajectories in these three domains of social-emotional development. The percentage of variance in linear changes explained by child demographic characteristics and the RCCP intervention components ranged from a minimum of zero for conduct problems to 24% for teachers' reports of prosocial behavior, and that for curvilinear changes ranged from zero for conduct problems to 33% for depressive symptoms. It should be noted, however, that on average, the intervention variables accounted for approximately the same amount of variance in growth as did the demographic variables. Thus, we conclude that a universal school-based preventive intervention like the RCCP can have a practically significant impact on children's developmental trajectories.

It is not surprising that most of the variance in the growth in children's trajectories was unexplained by these few demographic and intervention variables. There is a vast literature on temperamental (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Hinshaw, 1994) and familial (Booth, Rose-Krasnor, McKinnon, & Rubin, 1994; Campbell, 1990; Farrington & Hawkins, 1991) as well as neighborhood, school, and peer (Bierman & Wargo, 1995; Coie, Dodge, & Kupersmidt, 1990; Duncan, Brooks-Gunn, & Aber, 1997) influences on trajectories toward aggression and violence, and such influences were not the focus of this study of a universal school-based preventive intervention. Nonetheless, the present findings clearly indicate that school-based programs can play an important (but not the only) role in a comprehensive strategy to alter children's trajectories toward violence and aggression (Howard et al., 1999). The results also suggest that measures of the impact of components of preventive interventions could be useful metrics by which to gauge the relative power of interventions. Along these lines, these results have certainly prompted proponents of the RCCP to consider how they might modify its practices to strengthen its effects, for example, by significantly increasing the amount of classroom instruction children receive and by more closely examining (a) the process by which teachers are identified for greater amounts of training and coaching and (b) the dynamic involved in the delivery of that support.

Limitations and Implications of the Current Study

Despite these promising findings, there are several important limitations of this study that should be raised before we turn to a discussion of its implications for practice and policy as well as issues to be addressed in future research.

The most important limitation of the current study derives from the use of a quasi-experimental design. As mentioned above, because teachers volunteered for the RCCP and independently decided how much classroom instruction to implement over time, we cannot be sure whether the observed effects on children's developmental trajectories were due to the lessons themselves, to unobserved characteristics of the teachers, or to some combination of the two. Nonetheless, because children were not assigned to teachers on the basis of RCCP participation, we are confident that the estimated effects of "high lessons" teachers on children's developmental trajectories were unbiased.

Consequently, a high priority for future research should be to conduct a classic experimental study in which teachers or classrooms are randomly assigned to systematically varying levels of the RCCP or to a no-RCCP control condition and in which RCCP staff developers work hard to ensure that all teachers in the RCCP condition teach a prespecified number of lessons (e.g., 13 lessons per year, about the mean in this study, or 25 lessons per year, the amount that the RCCP intended for the teachers to teach and about one standard deviation above the mean number of lessons taught by RCCP teachers in this study). Such an experimental design would significantly improve the internal validity (the ability to attribute the *cause* of changes in children's trajectories to the amount of RCCP lessons per se) of the study of the effects of the RCCP on children's development.

But the current design has its advantages too, primarily in improving the external validity of the study. For example, the program was evaluated exactly as implemented at scale. In addition, the impact of the program was evaluated for a broad age range of children in elementary school from diverse racial/ethnic backgrounds in quite different schools and communities. The developmental effects of "high lessons" teachers were robust across most student demographic characteristics.

It should also be noted that the implications of these findings for both practice and policy are great whether future research determines that it is teacher characteristics or RCCP lessons per se that prove to be the causal factor in positively influencing children's social-emotional developmental trajectories. If it is RCCP lessons, then the practice and policy task is to train and support teachers to teach more and better lessons (see next paragraph). Conversely, if teacher characteristics prove to be the causal agent, these findings would likely prompt the development of a more rigorous screening process for the selection and retention of teachers who are able to use limited program resources to enhance their own professional development and effectively foster positive social-emotional development in their students. In either case, what is unambiguously clear is that being the student of a "high lessons" teacher promotes positive social-emotional development.

In addition to the paramount question of causation, future research should address a number of other unanswered questions critical to improving practice. Are children's individual growth trajectories affected by the trajectories of their classmates? Among teacher volunteers, why do some teach more lessons than others? Can modifications in the program (e.g., an increased number of lessons) lead to larger effects on children's developmental trajectories? Are these findings replicable in other school systems (especially suburban and rural schools) and in other age groups

(junior and senior high school)? Finally, do the short-term changes observed in children's social-emotional developmental trajectories have longer term positive effects on development, especially in the high school years, when aggressive and violent behavior peaks?

In future studies, we will examine the effects of exposure to the RCCP on growth in children's academic learning, and if there is an effect, we will test whether it is mediated by the changes in social-emotional development described in this report. We are also beginning a 6-year follow-up study to examine (a) whether the trajectories in these three domains of social-emotional development predict aggression and violence in Grades 7 to 12, (b) whether exposure to the RCCP reduces children's future risk for actual aggression and violence in adolescence, and (c) whether and how long-term effects are mediated and moderated by key family, peer, and school processes.

Finally, there are several potential implications for program and policy development that we wish to point out. Both the Resolving Conflict Creatively Program and this study should be viewed as part of the larger movement toward evidence-based approaches to school-based violence prevention (U.S. Department of Education, 2002) and social-emotional learning (CASEL, 2002; Payton et al., 2000). It is vitally important to rigorously evaluate new efforts at violence prevention and social-emotional learning so that education policymakers can use their limited resources to select programs with the greatest potential for positive impact. Most of the rigorous evaluations to date constitute efficacy studies and have maximized the internal validity of their studies in order to be as sure as possible about the causal influences of the intervention on children's development and potential for future violence. But unless those interventions are then (a) faithfully implemented just as evaluated and (b) transferred to and implemented in very similar contexts, policymakers and program developers cannot be sure the results are generalizable to new programs in new schools and communities with new populations of children.

For these reasons, studies like this one that maximize external validity (evaluation of programs implemented at scale and in diverse contexts) are a valuable complement to the true experiments that focus on causality. Indeed, the methods used in this study are easily adaptable by schools that wish to make evaluation of children's social-emotional development a standard part of their assessment procedures. We believe that research and evaluation for continuous program improvement are as important to program and policy development of school-based prevention efforts as experimental research is to identifying causality. As Dodge (2001) recently argued, it is imperative that prevention science extend its reach beyond developmental psychopathology studies and efficacy studies to effectiveness studies and to bringing preventive interventions to full scale. Only then can the science of youth violence prevention fully inform public policy.

These findings contribute to a growing knowledge base on school-based strategies for promoting social-emotional development and preventing youth violence. By integrating advances in both developmental science and prevention science, new preventive interventions can be based on our best knowledge of developmental trajectories toward future aggressive and violent behavior.

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