

Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and the teacher–child relationship during the school transition

Rebecca B. Silver^{a,*}, Jeffrey R. Measelle^a,
Jeffrey M. Armstrong^b, Marilyn J. Essex^b

^a*Department of Psychology, University of Oregon, Eugene, OR, USA*

^b*Department of Psychiatry, University of Wisconsin, Madison, WI, USA*

Received 10 October 2004; received in revised form 5 November 2004; accepted 5 November 2004

Abstract

The unique and interactive contributions of past externalizing behavior, negative parenting, and teacher–child relationship quality to externalizing behavior trajectories after the transition to school were examined. In a sample of 283 children, random regression analyses indicated that conflict in the teacher–child relationship during the school transition contributed to faster rates of increase in externalizing behavior from kindergarten through third grade above and beyond negative parenting and initial levels of externalizing behavior. A significant interaction between teacher–child closeness and the externalizing behavior intercept indicated that decreases in externalizing behavior were associated with teacher–child closeness, especially for children with the highest levels of externalizing behavior upon school entry. Family socioeconomic status and initial levels of classroom externalizing behavior in kindergarten were also significant contributors to the prediction of externalizing behavior trajectories. © 2005 Society for the Study of School Psychology. Published by Elsevier Ltd. All rights reserved.

Keywords: Teacher–child relationship; Externalizing behavior; School transition; Trajectories; Classroom behavior

* Corresponding author. Department of Psychology, 1227 University of Oregon, Eugene, OR 97403, USA. Tel.: 541 346 1982; fax: 541 346 4911.

E-mail address: rsilver@darkwing.uoregon.edu (R.B. Silver).

Introduction

Children who begin to exhibit externalizing behavior in childhood have an increased likelihood of sustained patterns of externalizing behavior across the lifespan and are at increased risk for developing long-term negative outcomes, including antisocial behavior in adolescence and adulthood (Broidy et al., 2003; Caspi, Elder, & Bem, 1987; Loeber, DeLamatre, Keenan, & Zhang, 1998; Loeber & Dishion, 1983; Loeber et al., 1993; Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002). Although these behaviors are usually stable once developed, not all children who express early emerging externalizing behavior problems (e.g., aggression, oppositionality, and conduct problems) manifest a stable externalizing trajectory (Campbell, Shaw, & Gilliom, 2000; Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998). At present, our understanding of which characteristics of the child and his/her social worlds will serve to increase or decrease the likelihood of stable externalizing trajectories is limited. The current study examined the contribution of child and family characteristics prior to school entry, as well as teacher–child relationship processes after the transition to kindergarten, to the development of externalizing behavior across the first four years of elementary school. In this endeavor, of interest were two aspects of externalizing behavior: levels of externalizing behavior at kindergarten entry and growth in externalizing behavior from kindergarten through third grade.

A developmental perspective on the precursors and correlates of externalizing behavior trajectories

In studying externalizing trajectories in the early school years, it is necessary to move beyond univariate models of risk and protection to examine the ways in which child and contextual influences jointly influence development. In approaching the study of child development, several researchers and theorists have highlighted the complex interplay between child characteristics and the multiple social contexts children inhabit (Boyce et al., 1998; Bronfenbrenner, 1979; Dodge & Pettit, 2003; Ladd, 1996; Rimm-Kaufman & Pianta, 2000). Within these ecologically oriented theories, several key tenets emerge. First, both child and contextual characteristics influence development, and they do so in unique and interactive ways. Second, *multiple* contexts, and relationships within these contexts, have developmental significance for children. Third, the impact of these contextual characteristics is dynamic and changes across time, such that relevant relationships broaden with age to encompass new contexts, with the salience of specific relationships varying across development. These theories suggest that there are child and relational risks that take shape early (e.g., child behavior, negative parenting) that may play a role in the development of sustained maladaptive trajectories. Also, relationships encountered later in development (e.g., with teachers) have emotional significance that, together with previous child and family factors, serve to promote adaptive or maladaptive developmental trajectories. Particularly relevant to the current study is the application of these ideas to understanding child adjustment during the transition to kindergarten (Cowan, Cowan, Ablow, Kahen-Johnson, & Measelle, in press; Ladd, 1996; Rimm-Kaufman & Pianta, 2000).

The transition to kindergarten as a developmentally salient transition

The entry into kindergarten is a near universal developmental transition in the U.S. that represents a qualitative change in context with accompanying social and academic challenges (Cowan et al., in press; Ladd, 1996; Rimm-Kaufman & Pianta, 2000). Typically, children make the transition to school and embark on trajectories that are characterized by little or no externalizing behaviors. However, there are some children who exhibit steadily increasing trajectories; for these children, the transition to school may pose a particularly significant challenge (Coie & Jacobs, 1993; Conduct Problems Prevention Research Group [CPPRG], 1992, 2002; Reid, 1993; Reid, Eddy, Fetrow, & Stoolmiller, 1999).

There are two subsets of children of particular interest. First, there are those for whom the known antecedents of externalizing behavior problems (e.g., coercive interaction patterns, oppositional or aggressive behaviors) are in place prior to school entry. For these children, the social processes of the new school context may act to expand the domains of relationship risk or protection in which maladaptive intra- and interpersonal behaviors may be continued, exacerbated, or ameliorated (see Reid, 1993 for a similar idea). Second, there are children with little or no prior evidence of risk for behavior problems for whom the transition to school and aspects of the classroom environment operate as catalysts for externalizing behaviors. Crucial to our work is the theoretical notion that the transition to school represents a stage of development that affords an opportunity for children's externalizing trajectories to be initiated, sustained, or altered, both positively and negatively. Taking into account risk and protective factors both prior to and after this transition will be critical for fully understanding the development of externalizing behavior during this period.

Early child and family characteristics

Given the stability of early emerging externalizing behavior (Campbell et al., 2000; Keenan et al., 1998; Moffitt, 1993), a history of such behaviors is clearly a risk factor for continued externalizing behavior during childhood. It is fairly common for children who exhibit such behaviors prior to school entry to move from a difficult-to-manage and irritable temperament in the first few years of life, to externalizing problems (e.g., oppositional, noncompliant, and aggressive behaviors) in early and middle childhood, to more serious antisocial behaviors in adolescence and adulthood (Hinshaw, Lahey, & Hart, 1993; Loeber et al., 1993, 1998; Moffitt, 1993; Patterson & Yoerger, 2002). Another child characteristic that delineates risk for externalizing symptoms is child gender (Robins, 1991). Beginning around preschool, boys are consistently more likely to express higher levels of externalizing behaviors at any given time point (Keenan & Shaw, 1997; Moffitt, Caspi, Rutter, & Silva, 2001). However, there has been less clarity about whether the developmental trajectories of externalizing behavior vary by gender (e.g., Broidy et al., 2003; Cote, Zoccolillo, Tremblay, Nagin, & Vitaro, 2001; Moffitt & Caspi, 2001; Moffitt et al., 2001; Silverthorn & Frick, 1999; Silverthorn, Frick, & Reynolds, 2001).

Prior to school entry, children's social worlds primarily revolve around the family, a context in which children develop and/or maintain maladaptive interpersonal strategies that manifest themselves in externalizing behaviors. Family relationship dynamics and parenting practices— in particular, coercive parent-child interactions, maternal hostility

and negativity, harsh and inconsistent discipline, and maternal responsiveness— have been shown to play important roles in the early expression of externalizing behavior (Hill, 2002; Hinshaw & Lee, 2003; Loeber & Dishion, 1983; Patterson, 1982; Patterson, Reid, & Dishion, 1992; Shaw, Gilliom, Ingoldsby, & Nagin, 2003; Shaw & Winslow, 1997). Surprisingly, although the parent–child relationship is widely recognized as an important contributor to the development of externalizing behaviors, the strength of these effects has been inconsistent (Rothbaum & Weisz, 1994). These authors have attributed these inconsistencies to methodological features of the studies, for example, the way in which parenting was operationalized (e.g., unidimensional vs. composite parenting measures).

In addition to relationship processes within the family, more distal family characteristics play a role in the development of externalizing behavior. Socioeconomic status (SES) is one such factor that has been associated with increased risk for externalizing behavior problems (Bradley & Corwyn, 2002; Dodge, Pettit, & Bates, 1994; Hill, 2002; Meich, Essex, & Goldsmith, 2001). The mechanism by which SES impacts the risk of later externalizing behavior problems is not well understood. It may be that SES acts on the development of externalizing behavior by limiting access to, and the ability to provide, resources that promote healthy child adjustment (Bradley & Corwyn, 2002), including parenting and family management skills (Capaldi & Patterson, 1994; Dodge et al., 1994; Harnish, Dodge, & Valente, 1995).

Classroom characteristics

Relationships formed with teachers, particularly during the school transition, may also play an important role in shaping subsequent classroom behavior. Relationships with teachers provide a context in which children learn, or continue to utilize, maladaptive interpersonal strategies; in fact, interactions between teachers and aggressive students contain patterns of coercive processes similar to those expressed between parents and children with behavior problems (Shores, Gunter, & Jack, 1993; Van Acker, Grant, & Henry, 1996).

Studies conducted with children following the transition to elementary school have illustrated that the quality of the kindergarten teacher–child relationship is associated with school adjustment, aggression, and conduct problems in the kindergarten classroom (Birch & Ladd, 1997; Pianta & Nimetz, 1991; Pianta & Steinberg, 1992) and is predictive of classroom behavior problems in subsequent elementary school years (Hamre & Pianta, 2001; Ladd & Burgess, 2001; Pianta, Steinberg, & Rollins, 1995). The dimensions of closeness and conflict have been found to be distinct components of the teacher–child relationship (Pianta & Steinberg, 1992; Pianta et al., 1995). In addition, each has been associated with externalizing behavior problems in the classroom; however, associations between externalizing behavior and teacher–child conflict have been more consistent and robust than associations between these behaviors and teacher–child closeness (Birch & Ladd, 1998; Hamre & Pianta, 2001). Conflict and closeness will be examined independently in the current study.

Joint contributions

Although the contributions of each of these domains of risk have been studied, there is a surprising paucity of empirical studies examining the ways in which multiple

relationship processes, distal familial risk, and child characteristics operate in unison to predict the development of externalizing behavior problems. Some evidence has suggested that negative and conflicted teacher–child relationships during the school transition years predicted externalizing behavior above and beyond that of child aggression, and exerted the most influence for children with a history of aggressive behaviors (Hamre & Pianta, 2001; Ladd & Burgess, 2001). Results regarding the unique and interactive contributions of parent–child and teacher–child relationship quality have been mixed. For example, Howes, Matheson, and Hamilton (1994) found that preschool children’s social competence with peers was affected by the quality of the teacher–child relationship but not maternal attachment. In contrast, Pianta, Nimetz, and Bennett (1997) found that teacher-rated behavior problems were uniquely predicted by aspects of the mother–child relationship during preschool but not the preschool teacher–child relationship. In the grades immediately following the transition to school, Hughes, Cavell, and Jackson (1999) found in one study that the correlation between the teacher–student relationship and subsequent aggressive behavior was strongest for children with poor attachment histories (Hughes et al., 1999). In another study, teacher–child relationships in the second and third grades predicted aggressive child behavior above and beyond initial levels of child aggression and maternal reports of harsh discipline practices; however, interactions between harsh maternal parenting practices and the quality of the teacher–student relationship were not predictive of aggressive behavior (Meehan, Hughes, & Cavell, 2003). Hughes and her colleagues have attributed these mixed results to methodological differences between studies (e.g., observational vs. self-report parenting constructs). Further research is needed that examines the ways in which child characteristics, family characteristics, and the teacher–child relationship contribute to early externalizing behavior problems across the transition to school.

The present study

The current study examined the manner in which early child and family risk factors work together with the quality of the teacher–child relationship to explain the development of early classroom externalizing behavior problems from kindergarten through third grade. It sought to understand the impact of these risk and protective factors on both levels of externalizing behavior in kindergarten (as measured by the intercept) and growth in externalizing behavior from kindergarten through third grade (as measured by the slope). This study explored these ideas using prospective data collected when children were in preschool, kindergarten, first grade, and third grade; child and family characteristics were reported on by parents (primarily mothers) prior to the entry to school while the quality of the teacher–child relationship and externalizing behavior was reported on by teachers after the transition to school.

This study had the following specific aims and hypotheses. First, the extent to which preschool child characteristics and experiences (gender, SES, past aggressive behavior, negative parenting) were important for understanding initial levels of teacher-reported externalizing behavior in the kindergarten classroom was examined. Consistent with previous research, it was hypothesized that exhibiting hostile aggressive behavior in preschool, being male, coming from a lower SES background, and having a history of

negative parenting would each increase the risk for high initial levels of externalizing behavior problems in the kindergarten classroom.

Second, the degree to which child, family, and classroom characteristics uniquely contributed to the prediction of externalizing trajectories between kindergarten and third grade was investigated. Although less research has examined the impact of multiple risk and protective factors on young children's externalizing behavior trajectories, it was nonetheless expected that higher levels of harsh parenting and kindergarten externalizing behavior would be associated with faster accelerations in externalizing behavior over time. Children from families with a higher SES were predicted to have slower increases or decreases in externalizing behavior from kindergarten through third grade. In addition, it was hypothesized that higher levels of conflict in the teacher–child relationship would be predictive of faster rates of increases in behavior problems while closeness in the teacher–child relationship would be associated with decreases in behavior problems over time. It was also expected that the rate of growth in externalizing trajectories to be greatest for boys.

Finally, the interactive contributions of child characteristics, family characteristics, and the kindergarten teacher–child relationship on the development of classroom externalizing behavior were examined. Given the lack of consistent findings on the ways in which these characteristics work together in an interactive manner, this was largely exploratory. Of the possible interactive effects, of primary interest was whether there were significant interactions between child and family characteristics and the quality of the teacher–child relationship. In other words, was the impact of the teacher–child relationship determined by the degree of risk (due to child or family characteristics) with which a child enters kindergarten? The quality of the teacher–child relationship may be important for children who begin school at risk for externalizing behavior, especially if it provides a positive experience to help counteract emerging externalizing tendencies. Alternatively, it may be that these children are most detrimentally affected by the teacher–child relationship if this relationship provides a new context for expressing and reinforcing preexisting behavior problems.

Method

Participants

The 283 target children (girls $n=142$; boys $n=141$) in the current study, were participants in the Wisconsin Study of Families and Work (WSFW), an ongoing longitudinal study of families and child development (Essex, Klein, Cho, & Kraemer, 2003). At its first wave of assessment, the WSFW evaluated 560 families from the Madison and Milwaukee areas during the women's second trimester of pregnancy (target child) through obstetrics clinics, private and university hospital clinics, and a large health maintenance organization (see Hyde, Klein, Essex, & Clark, 1995 for a complete description of inclusion criteria). To be included in the current sample, children needed to have all information relevant to the present study at four time points: preschool (when children were 4.5 years), kindergarten; first grade; and third grade. They also needed to have information about family socioeconomic status.

Over the years, participant attrition has been limited to less than 15% of the original sample. However, several factors explain why the current sample was smaller: (a) lack of teacher report data for children who were home-schooled in kindergarten, first-, or third-grade; (b) teacher, principal, or parent refusal of participation at any of the data collection points; (c) failure by mothers to return a set of questionnaires by mail, including the questionnaire from which the preschool behavioral measure was derived (see below); or (d) maternal refusal to give information on family income, which was part of the socioeconomic status construct (see below). Analyses comparing the total WSWF sample and the current sample revealed no differences in family income, maternal level of education, race/ethnicity, maternal marital status, the quality of the teacher–child relationship, and levels of externalizing behavior problems in the classroom.

The ethnic composition of this sample of children (based on mothers' report of their own ethnicity) was 89.8% White (not of Hispanic origin), 3.9% Black (not of Hispanic origin), 2.5% American Indian, 1.4% Latino, 1.8% Asian American, and less than 1% "other" (i.e. not white). At age 4.5, the mean family income was \$68,056 (median=\$60,000, range \$20,000 to \$300,000); most mothers (94.3%) were living with the target child's biological father, 4.2% were divorced or separated and living alone, and 1.4% were divorced and living with a new partner; 68.3% of the mothers were working; the average child was 4.6 years old (range=4.5 to 5.1). For the school years, average child age was 6.2 years (range=5.5 to 7.0 years) in kindergarten; 7.3 years (range=6.6 to 7.9) in first grade; and 9.3 years (range=8.6 to 10.3) in third grade.

Measures

Socioeconomic status

A composite of mother's and father's education level (measured as years of education completed) and annual family income during pregnancy, and at child age 12 months and 4.5 years, was used to measure family socioeconomic status (SES). Multiple assessments of family income were included due to the potential volatility of income (Bradley & Corwyn, 2002), especially around the time of and after childbirth, such as in this study. The SES composite was constructed using principle components analysis; over 50% of the variance was explained by the first component.

Child aggressive behavior prior to the entry of school

At age 4.5, mothers described their child's hostile-aggressive behavior problems in the past six months using the Preschool Behavior Questionnaire (Behar & Stringfield, 1974). The hostile-aggressive subscale consisted of 11 items such as "Fights with other children," "Blames others," and "Tells lies" rated on a 3-point scale from 0 (*does not apply*) to 2 (*certainly applies*). The composite score reflected the sum of the items. Internal consistency (coefficient α) was .82.

Maternal harsh/restrictive child rearing practices and beliefs

Mothers reported on child rearing practices and beliefs using the Block Child-rearing Practices Report (Block, 1965) when their child was 4.5 years old. The harsh/restrictive

parenting scale was comprised of 11 items. Examples include “I believe physical punishment is the best way of discipline,” “I do not allow (my) child to question my decisions,” and “There is a great deal of conflict between me and (my) child.” Scores reflected the mean of the items. Mothers responded to these items on a 7-point scale from 1 (*extremely untrue*) to 7 (*extremely true*). Internal consistency was $\alpha=.67$.

Kindergarten teacher–child relationship quality

Kindergarten teachers rated the quality of their relationship with the target child using a shortened version of the Student–Teacher Relationship Scale (STRS; Pianta et al., 1995). For the current study, the closeness and conflict scales were used, each based on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely does apply*). Five items comprised the closeness scale (e.g., “I share an affectionate, warm relationship with this child,” “This child openly shares his/her feelings and experiences with me”). The conflict scale also included five items (e.g., “This child and I always seem to be struggling with each other”). Internal consistency was $\alpha=.83$ for the closeness scale and $\alpha=.87$ for the conflict scale.

Child externalizing behavior

Externalizing behavior in the kindergarten, first, and third grade classrooms was reported on by teachers using the Mental Health Subscales of the MacArthur Health and Behavior Questionnaire (HBQ; Boyce et al., 2002; Essex et al., 2002), a parent- and teacher-report measure designed for middle childhood. Information about the validity and reliability of the HBQ Mental Health Subscales has been reported elsewhere (Ablow et al., 1999; Essex et al., 2002). The items in the composite used a 3-point scale ranging from 0 (*never or not true*) to 2 (*often or very true*); teachers were asked to report how true each statement was for the target child over the past six months. Scores were derived by averaging items.

To represent the expression of externalizing behavior in middle childhood,¹ a composite score of externalizing symptoms was constructed from the teacher-report HBQ using the oppositional-defiant disorder subscale (9 items), the overt aggression subscale (4 items), and the conduct disorder subscale (11 items). Internal consistency in the current sample was $\alpha=.93$, $\alpha=.90$, and $\alpha=.93$ for kindergarten, first-, and third-grade teachers, respectively.

¹ This construct was chosen because it represents a developmentally appropriate strategy for identifying behaviors that indicate a child may be at risk for more serious externalizing and antisocial behavior. Using symptomatology from one diagnostic category such as conduct disorder, particularly when children are very young and may not express high rates of such extreme behaviors, may exclude children who exhibit other externalizing behaviors. Similarly, it may not make sense to measure these behaviors separately as it is not yet clear that the diagnostic categories of oppositional defiant disorder and conduct disorder are in fact distinct (Hill, 2002). In addition, given the heterotypic continuity of such behavior (Hinshaw & Lee, 2003; Hinshaw & Zupan, 1997; Moffitt, 1993), choosing behaviors indicative of risk for a particular developmental period is especially important. Physical aggression, verbal aggression, and oppositional-defiant tendencies in early grade school are clinical indicators of later externalizing and antisocial behavior (Hinshaw & Lee, 2003). In addition, the inclusion of conduct disorder symptomatology ensures that the measure of early externalizing behavior incorporates behaviors that may be indicative of more serious maladjustment.

Procedure

When their children were 4.5 years old, prior to entering kindergarten, mothers were interviewed about their child rearing beliefs and practices and about their children's aggressive behaviors. To obtain information about SES, parents were interviewed about their educational attainment during pregnancy and mothers were interviewed about family annual income during pregnancy and when their children were 12 months and 4.5 years. In the spring of kindergarten, teachers were interviewed about the quality of their relationship with these children and the children's externalizing behavior. In the spring of first and third grades, new sets of teachers were interviewed about children's externalizing behaviors in the classroom.

Analysis framework

Analyses were conducted using random regression growth curve models (RRM; Rogosa, Brandt, & Zimowski, 1982). The first step in using RRM is to generate individual intercept and slope parameters for each child; this was done using the kindergarten, first grade, and third grade scales for externalizing behavior problems. The intercept represents the initial level of externalizing behavior in kindergarten. The slope represents the linear change in externalizing behaviors across the kindergarten through third grade period. Once generated, these parameters can be used as independent or dependent variables within a multiple regression framework.

Results

Descriptive statistics and relationships among variables

Table 1 presents the means and standard deviations for all preschool, kindergarten, first-grade, and third-grade variables as well as for the children's externalizing intercept and slope parameters. Although the means suggested that children in the present sample exhibited few behavior problems on average, had a slow increase in their externalizing behaviors across time, and had generally positive relationships with mothers and teachers, these data exhibited variability. In addition, some data demonstrated positive and negative skewness. Accordingly, all analyses were recomputed using variables that had been transformed with a square-root transformation. As the primary results did not change, results using non-transformed data are presented here for ease of interpretation.

Mean level differences between male and female participants were examined for all variables. Significant gender differences were present for teacher-child relationship conflict and closeness as well as externalizing behavior problems in kindergarten, first-grade, and third-grade. According to their teachers, boys exhibited significantly more classroom externalizing behavior than girls and had more conflictual relationships with their teachers. Girls typically had closer relationships with their teachers than boys. The externalizing slope was not significantly different between boys and girls, suggesting comparable rates of growth in this domain.

Table 1

Means, standard deviations, and gender differences for the intercept and slope parameters, and preschool, kindergarten, first grade, and third grade variables

Variable	Total ^a	Males ^b	Females ^c	Gender differences
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	<i>t</i>
<i>Preschool</i>				
Socioeconomic status	.04 (.94)	-.03 (.88)	.11 (1.0)	-1.21
Hostile-aggressive child behavior	5.89 (3.36)	6.06 (3.62)	5.73 (3.08)	.81
Harsh/restrictive child rearing	2.93 (.64)	2.96 (.65)	2.91 (.63)	.79
<i>Kindergarten</i>				
Teacher-child relationship quality, closeness	4.36 (.69)	4.28 (.72)	4.44 (.64)	-1.96*
Teacher-child relationship quality, conflict	1.41 (.69)	1.54 (.83)	1.30 (.47)	3.21**
Classroom externalizing behavior	.16 (.25)	.21 (.30)	.11 (.18)	3.19**
<i>First grade</i>				
Classroom externalizing behavior	.16 (.23)	.21 (.27)	.11 (.17)	3.75*
<i>Third grade</i>				
Classroom externalizing behavior	.19 (.27)	.24 (.30)	.13 (.22)	3.38**
<i>Intercept and slope parameters</i>				
Externalizing behavior slope	.01 (.12)	.02 (.13)	.01 (.12)	.41
Externalizing behavior intercept	.15 (.24)	.20 (.28)	.11 (.17)	3.37**

^a *N*=283.

^b *n*=141.

^c *n*=142.

* *p*<.05.

** *p*<.01.

Intercorrelations among child, family, and classroom risk and protective factors were examined and the results are presented in Table 2. Results indicated that these variables were modestly to moderately correlated with each other (mean $r=.13$, range=.02–.35) with the highest correlation occurring between conflict and closeness in the kindergarten teacher-child relationship ($r=-.35$). Bivariate correlations between these variables and the externalizing intercept and slope terms can also be found in Table 2. Significant correlations between child, family, and classroom characteristics and the externalizing intercept term suggested that higher initial levels of externalizing behavior were more likely for boys, for children with higher levels of hostile-aggressive behavior in preschool, and for children whose teacher-child relationships were characterized as less warm and more conflictual by their kindergarten teachers. Bivariate correlations between risk and protective factors and the externalizing slope parameter indicated a significantly faster rate of growth in externalizing behaviors for children from lower SES backgrounds, and with more conflictual relationships with kindergarten teachers. The correlation between the intercept and the slope of externalizing behavior was negative indicating that for children showing higher initial levels of externalizing behaviors, those behaviors increased more slowly or even declined over time, whereas for children exhibiting lower initial levels of externalizing behaviors, those behaviors typically increased more rapidly over time.

Table 2
Intercorrelations between scales

Scale	2	3	4	5	6	7	8	9	10	11
<i>Preschool</i>										
1. Gender	.07	-.05	-.05	.12*	-.19**	-.19**	-.22**	-.20**	-.02	-.20**
2. SES	–	-.10	-.06	.02	-.09	-.06	-.17**	-.18**	-.13*	-.07
3. Aggressive behavior	–	–	.29**	-.23**	.26**	.27**	.23**	.21**	-.05	.28**
4. HRCR	–	–	–	-.05	.04	.10	.12*	.07	-.02	.11
<i>Kindergarten</i>										
5. TCR closeness	–	–	–	–	-.35**	-.26**	-.15*	-.22**	.02	-.23**
6. TCR conflict	–	–	–	–	–	.75**	.48**	.49**	-.23**	.73**
7. Externalizing behavior	–	–	–	–	–	–	.60**	.54**	-.43**	.97**
<i>First grade</i>										
8. Externalizing behavior	–	–	–	–	–	–	–	.62**	.06	.73**
<i>Third grade</i>										
9. Externalizing Behavior	–	–	–	–	–	–	–	–	.53**	.49**
<i>Intercept/slope</i>										
10. Externalizing slope	–	–	–	–	–	–	–	–	–	-.46**
11. Externalizing intercept	–	–	–	–	–	–	–	–	–	–

SES—Socioeconomic Status; TCR—Teacher–child relationship; HRCR—Harsh/restrictive child rearing.

* $p < .05$.

** $p < .01$.

Preschool predictors of children's externalizing behavior in kindergarten

Using a multivariate regression model, we examined the extent to which preschool child (child gender and preschool aggression) and family characteristics (SES, harsh/restrictive parenting) each predicted children's externalizing behavior in kindergarten as measured by the RRM intercept term. Children's gender ($\beta = -.18$, $p < .01$) and preschool aggression ($\beta = .26$, $p < .01$) significantly predicted individual differences in children's externalizing behavior as measured by the kindergarten intercept. Boys and children exhibiting higher mother-reported preschool aggression were rated as more externalizing by teachers during kindergarten. Neither familial socioeconomic status ($\beta = -.03$, $p > .05$) nor parental harshness ($\beta = .02$, $p > .05$) was related significantly to the externalizing intercept term. Thus, child gender and preschool hostile-aggressive behavior, but neither negative parenting nor familial SES, were significant contributors to externalizing behavior in kindergarten.

Child, family, and school predictors of growth in children's externalizing behavior

We next tested the extent to which child, family, and school variables around the transition to school jointly predicted growth in children's externalizing behavior from kindergarten through third grade. In addition to the main effects of these variables, mean-centered interaction terms were included to test the interactive contribution of these variables. Given the large number of potential interactions, and the increased risk of multicollinearity and parameter instability, before proceeding with our primary analysis, we attempted to determine whether the final model would need to include interaction

terms with child gender and SES. Significant two- and three-way interactions involving gender were inconsistent and added minor amounts of variance at best (i.e., R^2 change < .02) above and beyond the main effects in the model. These findings led us to retain gender as a main effect predictor in subsequent analyses, but not include interactions with gender. Interactions with SES were also examined. Similar results lead us to treat it as a main effect predictor in all subsequent models, but not include interaction terms with SES. The RRM intercept term was entered as a measure of previous externalizing behavior to ensure a truly prospective effects model.² This model allowed us to test hypotheses about the unique contribution of child, family, and school characteristics to the prediction of externalizing trajectories and explore possible interactive effects of these variables.

Table 3 presents the results of these analyses. Overall, this model accounted for a significant 30% of the variance in growth of teacher-reported externalizing behavior problems in the classroom. Family SES, but not child gender or the measure of parental harshness during preschool, was a unique predictor of children's externalizing trajectories. Children whose families had a higher SES either had externalizing behavior that increased more slowly or decreased more quickly from kindergarten through third grade. As expected, the RRM intercept term was uniquely predictive such that children described by teachers as more externalizing at baseline tended either to grow more slowly or to decline more rapidly over time. Teachers' reports of their conflict but not their closeness with children emerged as a significant unique predictor of externalizing trajectories in this model. Higher levels of teacher-child conflict in kindergarten predicted more rapid escalations in children's externalizing behavior over time.

Finally, only the interaction between children's externalizing behavior at baseline and teacher-child closeness during kindergarten added significantly to the prediction of children's externalizing trajectories. To interpret the meaning of this significant interaction, we followed Aiken and West's (1991) post hoc probing procedures. Specifically, we examined the effects of teacher-child closeness on children's externalizing slope at three levels of the externalizing intercept term while controlling for all other terms in the model. The simple slopes for children with average levels of baseline externalizing behavior ($t(274) = -1.96, p < .05$) and for children with high levels of baseline externalizing behavior ($t(274) = -3.51, p < .01$) were significant; the simple slope for children with low baseline levels of externalizing behavior ($t(274) = -.93, ns$) was not statistically different than zero. Thus, the interaction between teacher-child closeness and children's baseline levels of externalizing behavior was statistically meaningful in terms of externalizing growth over time for typically- and highly-externalizing kindergartners. The graphical results of this probing technique are presented in Fig. 1. They revealed that teacher-child closeness had its strongest effect on children whose externalizing behavior at baseline was one standard deviation or more higher than the

² The model was also run including the main and interactive effects of preschool aggressive behavior; the results did not vary with the addition of these effects. In addition, the externalizing intercept term is a more stringent autoregressive term for the externalizing slope term than the preschool aggression measure. Further, preschool hostile aggressive behavior was a significant predictor of this externalizing intercept term. In combination, these findings led us to use the externalizing intercept as the measure of externalizing behavior with which a child begins school.

Table 3

Summary of regression analysis for child variables, preschool family variables, and kindergarten classroom variables predicting externalizing slope

Variable	β	t
Child gender	-.10	-1.86
Socioeconomic status	-.16	-3.15**
Preschool HRCR	.03	.60
Externalizing behavior intercept	-.69	-7.86**
Kindergarten TCR closeness	-.004	-.08
Kindergarten TCR conflict	.21	2.50**
TCR closeness by externalizing intercept interaction	-.20	-3.30**
TCR closeness by HRCR interaction	-.09	-1.58
TCR conflict by externalizing intercept interaction	-.06	-.64
TCR conflict by HRCR interaction	-.01	-.24

$R^2 = .30$ **.

TCR—teacher–child relationship quality; HRCR—harsh/restrictive child rearing.

** $p < .01$.

average level of externalizing behavior. For these more serious externalizers, a little or no closeness with teachers predicted externalizing growth, whereas medium to high levels of teacher–child closeness were related to increasingly larger *decelerations* in externalizing behavior over time. A similar, though less robust pattern of protection was

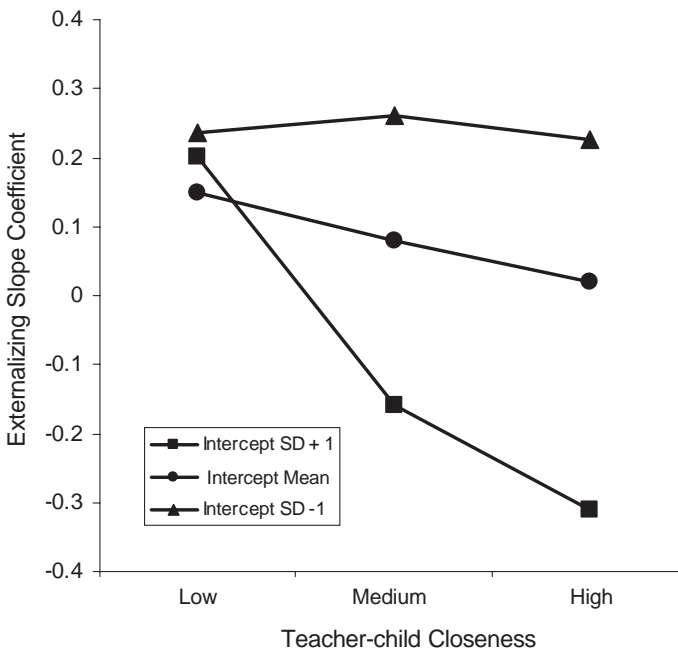


Fig. 1. Interaction between children's externalizing intercept and teacher–child closeness and associations with externalizing growth.

afforded to children whose baseline levels of externalizing behavior problems were at the mean. For these children, increasing levels of teacher–child closeness appeared to protect children from more rapid escalations in externalizing problems despite the normative upward trend. For children below mean levels of kindergarten externalizing, closeness with their teacher appeared essentially unrelated to subsequent externalizing growth. In sum, the association of teacher–child closeness and externalizing trajectories depended on the level of externalizing behavior in kindergarten; teacher–child closeness was most important for protecting children who were already exhibiting externalizing behaviors. This significant interaction held for both male and female children; when a three-way interaction between child gender, externalizing intercept, and teacher–child closeness was added to the regression model presented in Table 3, the interaction was found to be statistically non-significant ($\beta=.06, p>.05$).

Discussion

The present study examined the unique and interactive ways that child characteristics, family characteristics, and the teacher–child relationship contributed to the development of classroom externalizing behavior following the transition to school and across the early school years. Our finding that levels of teacher-reported externalizing behavior tended to, on average, increase slowly from kindergarten through third grade is consistent with other community samples that used teacher-reported child behavior (Keiley, Bates, Dodge, & Pettit, 2000). Slow growth, however, runs counter to most data presented on normative externalizing behavior trajectories using parent report data, in which trajectories typically decrease over time (Bongers, Koot, van der Ende, & Verhulst, 2003; Keiley et al., 2000). For parents, it may be that habituation to negative behavior or relief at now having school support to help with a difficult child translates into lower externalizing ratings over time. For teachers, increases in externalizing behavior may be explained by different behavioral expectations as children age, with teachers of younger children expecting worse behavior or viewing it as normative, therefore rating it less severely (Keiley et al., 2000). Alternatively, real change and the effects of different contexts may account for this discrepancy: parents may actually see less externalizing behavior in the home and teachers may see more in the classroom.

Results from this study reveal that the quality of the teacher–child relationship is important for understanding the development of externalizing behavior problems in the classroom. Teacher reports of conflict in the kindergarten teacher–child relationship were associated with more rapid growth in externalizing behavior problems from kindergarten through third grade. Although the main effect of closeness in the teacher–child relationship did not significantly contribute to the growth of externalizing behavior, a significant interaction between teacher–child closeness and the externalizing intercept term was found. This indicated that the impact of teacher–child closeness was strongest for children who exhibited the highest initial levels of externalizing behavior. For these children, lower levels of closeness in the teacher–child relationship were associated with increases in externalizing behavior over time while average to high levels of closeness were associated with significant declines in externalizing behavior over time. Analysis of a three-way

interaction that also included child gender was not significant, suggesting that this pattern applied similarly to boys and girls.

These findings are noteworthy on multiple fronts. First, they point to the developmental impact of non-familial adult–child relationships during periods of transition. These data are in accord with past studies that have found the teacher–child relationship to be predictive of classroom behavior problems in years following the school transition (Hamre & Pianta, 2001; Hughes et al., 1999; Ladd & Burgess, 2001; Meehan et al., 2003; Pianta et al., 1995). Importantly, these results provide some of the first evidence that aspects of the teacher–child relationship are not only important for understanding child behavior at individual points in time, but also predict the rate of growth and decline in externalizing behavior in years immediately following the transition to school. Relationships with teachers may provide a context in which children do or do not gain aspects of the emotional support needed to transition successfully to school and appear to be formative and consequential for children’s subsequent classroom behavior. From these data, we conclude that the teacher–child relationship has implications for whether trajectories of early externalizing behavior are maintained, exacerbated, reduced, or triggered.

Second, this study has contributed to the paucity of information available regarding the ways in which the teacher–child relationship has influence on the development of externalizing behavior in concert with child and family characteristics by providing evidence of both unique and interactive contributions of the teacher–child relationship. Consistent with previous studies, teacher–child conflict was predictive of externalizing behavior trajectories above and beyond past child behavior (Hamre & Pianta, 2001; Ladd & Burgess, 2001) and negative parenting (Howes et al., 1994; Meehan et al., 2003). In fact, in the current study, conflict in the teacher–child relationship was a risk factor for faster rates of growth in classroom externalizing behavior problems while negative parenting was not. Although the impact of negative parenting may be limited by methodological considerations (discussed below), this provides important information about the role of teachers in contributing to the development of classroom behavior. In addition, similar to previous studies (Hamre & Pianta, 2001; Ladd & Burgess, 2001), there was evidence of a significant interaction between past externalizing behavior and the effect of the teacher–child relationship on future behavior problems; however, the previous studies discussed the increased risk afforded children with past aggressive behavior and *negative* teacher–child relationships. The current study is among the first to illustrate that *positive* aspects of the teacher–child relationship serve to lower the risk associated with higher levels of disruptive behavior at the start of school.

Third, this study has provided us with insight into the distinct ways in which teacher–child conflict and teacher–child closeness are associated with the development of externalizing behavior problems. These aspects of the teacher–child relationship are not simply two points on a continuum; teachers may experience relationships with children as both high in conflict and high in warmth (as indicated by moderate correlations between conflict and closeness). Conflict in teacher–child relationships appears to capture teachers’ experience of tension and challenge while working with certain students (e.g., we always seem to be struggling), which is more likely to occur with children who exhibit disruptive classroom behavior. This is supported by the high bivariate correlation between concurrent ratings of kindergarten teacher–child conflict and kindergarten externalizing behaviors

($r=.75$). Thus, conflict in the kindergarten teacher–child relationship may reflect, in part, child-driven effects on teachers' interpretations of relationships. Regardless of initial risk status, conflict is a marker of troubled relationship processes and has the potential to increase behavior problems over time. On the other hand, reports of closeness in the kindergarten teacher–child relationship may be less reflective of children's effect on teachers and more representative of a teacher's ability to foster trust and warmth with a child. Although this type of relationship is more easily attained with children who do not exhibit behavior problems, it may be that our most skillful teachers are those who can create a classroom environment that facilitates these kinds of interactions with most children. These supportive interactions may be especially important for children exhibiting initially high levels of externalizing behavior at the beginning of school.

How did preschool child and family characteristics predict externalizing behavior around school entry? Child gender significantly contributed to the prediction of initial levels of teacher-reported externalizing behavior in the classroom, but not the externalizing slope. Boys were more likely to exhibit higher levels of externalizing behavior in kindergarten, though the direction and rate of symptom growth was comparable for boys and girls. This is consistent with existing literature in which male children exhibited higher rates of externalizing problems beginning in preschool (Keenan & Shaw, 1997; Moffitt et al., 2001) and had significantly higher externalizing intercept values (measured at age 4 and 5) in studies of normative externalizing behavior trajectories (Bongers et al., 2003; Keiley et al., 2000). There has been less inquiry into the relationship between gender and externalizing behavior trajectories. Most studies addressing gender and the development of externalizing behavior have focused on the relevance of the life course persistent/adolescent limited taxonomy put forth by Moffitt (1993) to female populations (e.g., Moffitt & Caspi, 2001; Silverthorn & Frick, 1999; Silverthorn et al., 2001) while few have examined gender differences in shape of change over time. Some that have investigated gender differences in externalizing trajectories found significantly faster rates of decrease over time for boys (Bongers et al., 2003; Keiley et al., 2000). This is clearly an area for continued study that will benefit from close consideration of evidence that the nature of aggression may be different for boys and girls (Crick & Grotpeter, 1995; Underwood, 2003).

Indicators of children's level of previous externalizing behavior were significant predictors of both the externalizing behavior intercept and slope term. As would be expected, children with higher rates of preschool aggressive behaviors expressed higher levels of classroom externalizing behavior problems in kindergarten; however, there was no significant association between mother-reported preschool aggressive behavior and the teacher-reported externalizing slope. In contrast with preschool hostile-aggressive behavior, the externalizing intercept term was a unique predictor of the externalizing slope; children who exhibited higher levels of teacher-reported externalizing behavior in kindergarten were more likely to have slower accelerations or faster declines in classroom externalizing behavior from kindergarten to third grade. In sum, these results highlight the importance of past behavior histories on stability and rates of growth or decline in externalizing behavior; however, limitations to cross-setting consistency may exist when attempting to understand increases or decreases in these behaviors over time.

SES was not a significant predictor of initial levels of externalizing behavior problems. It was, however, a significant predictor of the externalizing slope; having a higher familial

SES was associated with slower rates of increase or even decreases in externalizing trajectories. The importance of SES for understanding the development of classroom externalizing behavior is consistent with previous research (Bradley & Corwyn, 2002; Dodge et al., 1994). Although beyond the scope of this article, future research should focus on the mechanisms by which SES impacts the development of classroom externalizing behavior problems. In particular, research should focus on possible mediational paths that involve children's relationships with their teachers and parents or other aspects of the family or school context that contribute to the development of externalizing behaviors.

To our surprise, negative parenting was a non-significant contributor to the initial level of externalizing behavior in kindergarten and to externalizing trajectories, as represented by the random regression intercept and slope terms, respectively. The lack of predictive power of negative parenting is inconsistent with past research (see Hinshaw & Lee, 2003 for a review). Although surprised, we think it is unlikely that this is the result of method artifact (i.e., the relative strength of the teacher–child relationship effects was due to the fact that our outcome was also derived using teacher report). Specifically, the regression models offered a fairly stringent control over the influence of reporter bias. In these equations, reporter bias would have manifested itself in the initial auto-regressive association between the externalizing intercept and the externalizing slope, and this effect would have been statistically controlled (i.e. omitted from the unique effect estimates for each term) when testing all other predictors. One plausible explanation for our finding is the independence of sources used to describe parenting practices and children's behavior problems. Inconsistencies between multiple informants' reporting of externalizing behavior (Angold & Costello, 1996; Kraemer et al., 2003) and the influence of context-specific features on child behavior may explain the limited predictive utility of maternal reports of parenting practices. At this early stage of development and in an unselected community sample, parenting behaviors may relate more consistently with externalizing behavior expressed in the home.

Limitations and implications

Although encouraging, our results must be interpreted in light of several limitations. One limitation is the relative homogeneity of the sample in terms of ethnicity and socioeconomic status. Another limitation is that the teacher–child relationship is solely reported on by the kindergarten teacher; future research should incorporate additional reports of the teacher–child relationship (e.g., child self-report and observer ratings). Another weakness is the limited information on parenting practices; the utilization of additional parenting measures could lead to a better operationalized parenting construct. In particular, using an assessment approach that incorporates observational or interview methodologies and utilizes a negative parenting construct composed of multiple parenting measures could increase the impact of parenting on these behaviors (Rothbaum & Weisz, 1994). Also, given the low base rates of negative behaviors and troubled relationship processes, replication with a clinical sample is warranted.

Despite these limitations, the implications of our findings are important. They suggest that utilizing information about children's past externalizing behavior and conflict in the

teacher–child relationship may be helpful for identifying children at-risk for the development of increasingly serious externalizing behavior. In addition, focusing on decreasing conflict and increasing warmth between teachers and children during the transition to school may be a useful strategy for altering the trajectory of classroom externalizing behavior problems. In this vein, several preventive intervention programs have started to utilize proactive classroom management and a focus on positive classroom relationships with promising results (Battistich & Hom, 1997; CPPRG, 2002; Hawkins, Von Cleave, & Catalano, 1991; Kellam, Rebok, Ialongo, & Mayer, 1994; Reid et al., 1999; Reid, Webster-Stratton, & Hammond, 2003; Walker, Severson, Feil, Stiller, & Golly, 1998). Increasing warmth and closeness with children who enter school already exhibiting externalizing behavior problems may be especially important. Unfortunately, it may also be particularly challenging, as it is these children with whom teachers are most likely to engage in a fair amount of behavioral redirection. Methods for establishing warmth and closeness in relationships with challenging students and providing resources and support for teachers have begun to be addressed (Pianta, 1999); however, continued attention needs to be directed towards this area. Developing, and empirically validating, strategies for successfully working with more challenging students and supporting their teachers seems to be a promising direction for preventive intervention strategies that aim to promote healthy adjustment.

Acknowledgements

This work was supported by a Ruth L. Kirschstein Predoctoral National Service Research Award granted to the first author (NIMH grant 1F31 MH68959-01A1), NIMH grant MH44340 (Marilyn J. Essex, Principal Investigator), and the John D. and Catherine T. MacArthur Foundation Research Network on Psychopathology and Development (David J. Kupfer, Chair).

References

- Ablow, J. C., Measelle, J. R., Kraemer, H. C., Harrington, R., Luby, J., Smider, N. A., et al. (1999). The MacArthur three-city outcome study: Evaluating multi-informant measures of young children's symptomatology. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1580–1590.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- Angold, A., & Costello, J. E. (1996). The relative diagnostic utility of child and parent reports of oppositional defiant behaviors. *International Journal of Methods in Psychiatric Research*, 6, 253–259.
- Battistich, V., & Hom, A. (1997). The relationship between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health*, 87, 1997–2001.
- Behar, L., & Stringfield, S. (1974). A behavior rating scale for the preschool child. *Developmental Psychology*, 10, 601–610.
- Birch, S. H., & Ladd, G. W. (1997). The teacher–child relationship and children's early school adjustment. *Journal of School Psychology*, 35, 61–79.
- Birch, S. H., & Ladd, G. W. (1998). Children's interpersonal behaviors and the teacher–child relationship. *Developmental Psychology*, 34, 934–946.

- Block, J. H. (1965). *The child-rearing practices report*. Berkeley, CA: Institute of Human Development, University of California.
- Bongers, I. L., Koot, H. M., van der Ende, J., & Verhulst, F. C. (2003). The normative development of child and adolescent problem behavior. *Journal of Abnormal Psychology, 112*, 179–192.
- Boyce, W. T., Essex, M. J., Woodward, H. R., Measelle, J. R., Ablow, J. C., & Kupfer, D. J. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood: I. Exploring the “headwaters” of early life morbidities. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*, 580–587.
- Boyce, W. T., Frank, E., Jensen, P. S., Kessler, R. C., Nelson, C. A., & The MacArthur Foundation Research Network on Psychopathology and Development. (1998). Social context in developmental psychopathology: Recommendations from the MacArthur network on psychopathology and development. *Development and Psychopathology, 10*, 143–164.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371–399.
- Broidy, L. M., Nagin, D. S., Tremblay, R. E., Bates, J. E., Brame, B., Dodge, K. E., et al. (2003). Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six site, cross-national study. *Developmental Psychology, 39*, 222–245.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge: Harvard University Press.
- Campbell, S. B., Shaw, D. D., & Gilliom, M. (2000). Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467–488.
- Capaldi, D. M., & Patterson, G. R. (1994). Interrelated influences of contextual factors on antisocial behavior in childhood and adolescence for males. In D. C. Fowles, P. Sukler, & S. H. Goodman (Eds.), *Progress in experimental personality and psychopathology research* (pp. 165–198). New York: Springer Publishing.
- Caspi, A., Elder, G. H., & Bem, D. J. (1987). Moving against the world: Life-course patterns of explosive children. *Developmental Psychology, 23*, 308–313.
- Coie, J. D., & Jacobs, M. R. (1993). The role of social context in the prevention of conduct disorder. *Development and Psychopathology, 5*, 263–275.
- Conduct Problems Prevention Research Group. (1992). A developmental and clinical model for the prevention of conduct disorder: The FAST Track Program. *Development and Psychopathology, 4*, 509–527.
- Conduct Problems Prevention Research Group. (2002). The implementation of the Fast Track Program: An example of a large-scale prevention science efficacy trial. *Journal of Abnormal Child Psychology, 30*, 1–17.
- Cote, S., Zoccolillo, M., Tremblay, R. E., Nagin, D., & Vitaro, F. (2001). Predicting girls’ conduct disorder in adolescence from childhood trajectories of disruptive behaviors. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 678–684.
- Cowan, P. A., Cowan, C. P., Ablow, J. C., Kanen-Johnson, V., & Measelle, J.R. (in press). The family context of parenting in children’s adaptation to school: Support for early intervention. *Monographs in Parenting*.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710–722.
- Dodge, K. A., & Pettit, G. S. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology, 39*, 349–371.
- Dodge, K. A., Pettit, G. S., & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development, 65*, 649–665.
- Essex, M. J., Boyce, W. T., Goldstein, L. H., Armstrong, J. M., Kraemer, H. C., & Kupfer, D. J. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood: II. Developing the MacArthur Health and Behavior Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*, 588–595.
- Essex, M. J., Klein, M. H., Cho, E., & Kraemer, H. C. (2003). Exposure to maternal depression and marital conflict: Gender differences in children’s later mental health symptoms. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*, 728–737.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children’s school outcomes through eighth grade. *Child Development, 72*, 625–638.

- Harnish, J. D., Dodge, K. A., & Valente, E. (1995). Mother–child interaction quality as a partial mediator of the roles of maternal depressive symptomatology and socioeconomic status in the development of child behavior problems. *Child Development, 66*, 739–753.
- Hawkins, J. D., Von Cleave, E., & Catalano, R. F. (1991). Reducing early childhood aggression: Results of a primary prevention program. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 208–217.
- Hill, J. (2002). Biological, psychological, and social processes in the conduct disorders. *Journal of Child and Adolescent Psychology and Psychiatry, 43*, 133–164.
- Hinshaw, S. P., Lahey, B. B., & Hart, E. L. (1993). Issues of taxonomy and comorbidity in the development of conduct disorder. *Development and Psychopathology, 5*, 31–49.
- Hinshaw, S. P., & Lee, S. S. (2003). Conduct and oppositional defiant disorders. In E. J. Mash, & R. A. Barkeley (Eds.), *Child psychopathology* (pp. 144–198). New York: The Guilford Press.
- Hinshaw, S. P., & Zupan, B. A. (1997). Assessment of antisocial behavior in children and adolescents. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 36–50). New York: Wiley.
- Howes, C., Matheson, C. C., & Hamilton, C. E. (1994). Maternal, teacher, and child care correlates of children's relationships with peers. *Child Development, 65*, 264–273.
- Hughes, J. N., Cavell, T. A., & Jackson, T. (1999). Influence of the teacher–student relationship on childhood conduct problems: A prospective study. *Journal of Clinical Child Psychology, 28*, 173–184.
- Hyde, J. S., Klein, M. H., Essex, M. J., & Clark, R. (1995). Maternity leave and women's mental health. *Psychology of Women Quarterly, 16*, 257–285.
- Keenan, K., & Shaw, D. (1997). Developmental and social influence on young girls' early problem behavior. *Psychological Bulletin, 121*, 95–113.
- Keenan, K., Shaw, D., Delliquadri, E., Giovannelli, J., & Walsh, B. (1998). Evidence for the continuity of early problem behaviors: Application of a developmental model. *Journal of Abnormal Child Psychology, 26*, 441–454.
- Keiley, M. K., Bates, J. E., Dodge, K. A., & Pettit, G. S. (2000). A cross-domain growth analysis: Externalizing and internalizing behaviors during 8 years of childhood. *Journal of Abnormal Child Psychology, 28*, 161–179.
- Kellam, S. G., Rebok, G. W., Ialongo, N., & Mayer, L. S. (1994). The course and malleability of aggressive behavior from early first grade into middle school: Results of a developmental epidemiologically-based preventive trial. *Journal of Child Psychology and Psychiatry, 35*, 259–281.
- Kraemer, H. C., Measelle, J. R., Ablow, J. C., Essex, M. J., Boyce, W. T., & Kupfer, D. J. (2003). New approaches to multiple informants: Mixing and matching contexts and perspectives. *American Journal of Psychiatry, 160*, 1566–1577.
- Ladd, G. W. (1996). Shifting ecologies during the 5 to 7 year period: Predicting children's adjustment during the transition to school. In A. J. Sameroff, & M. M. Haith (Eds.), *The five to seven year shift: The age of reason and responsibility* (pp. 363–383). Chicago: University of Chicago Press.
- Ladd, G. W., & Burgess, K. B. (2001). Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development, 72*, 1579–1601.
- Loeber, R., DeLamatre, M. S., Keenan, K., & Zhang, Q. (1998). A prospective replication of developmental pathways in disruptive and delinquent behavior. In R. Cairns, L. Bergman, & J. Kaplan (Eds.), *Methods and models for studying the individual* (pp. 185–215). Thousand Oaks, CA: Sage.
- Loeber, R., & Dishion, T. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin, 94*, 68–99.
- Loeber, R., Wung, P., Keenan, K., Giroux, B., Stouthamer-Loeber, M., Van Kammen, W. B., et al. (1993). Developmental pathways in disruptive child behavior. *Development and Psychopathology, 5*, 103–133.
- Meehan, B. T., Hughes, J. N., & Cavell, T. A. (2003). Teacher–student relationships as compensatory resources for aggressive children. *Child Development, 74*, 1145–1157.
- Meich, R., Essex, M. J., & Goldsmith, H. H. (2001). Socioeconomic status and the adjustment to school: The role of self-regulation during early childhood. *Sociology of Education, 74*, 102–120.
- Moffitt, T. E. (1993). Adolescent-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674–701.

- Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology*, *13*, 355–375.
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescent-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology*, *14*, 179–207.
- Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex differences in antisocial behavior: Conduct disorder, delinquency, and violence in the Dunedin longitudinal study*. Cambridge, UK: Cambridge University Press.
- Patterson, G. R. (1982). *Coercive family process: III. A social learning approach to intervention*. Eugene, OR: Castilia.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *A social learning approach: IV. Antisocial boys*. Eugene, OR: Castilia.
- Patterson, G., & Yoerger, K. (2002). A developmental model for early- and late-onset delinquency. In J. B. Reid, G. R. Patterson, & J. Snyder (Eds.), *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention* (pp. 147–172). Washington, DC: American Psychological Association.
- Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington, DC: American Psychological Association.
- Pianta, R. C., & Nimetz, S. L. (1991). Relationships between children and teachers: Associations with classroom and home behavior. *Journal of Applied Developmental Psychology*, *12*, 379–393.
- Pianta, R. C., Nimetz, S. L., & Bennett, E. (1997). Mother–child relationships, teacher–child relationships, and school outcomes in preschool and kindergarten. *Early Childhood Research Quarterly*, *12*, 263–280.
- Pianta, R. C., & Steinberg, M. S. (1992). Teacher–child relationships and the process of adjusting to school. In R. Pianta (Ed.), *Beyond the role of the parent: The role of other adults in children's lives, new directions in child development* (pp. 61–80). San Francisco: Jossey-Bass.
- Pianta, R. C., Steinberg, M. S., & Rollins, K. B. (1995). The first two years of school: Teacher–child relationships and deflections in children's classroom adjustment. *Development and Psychopathology*, *7*, 295–312.
- Reid, J. B. (1993). Prevention of conduct disorder before and after school entry: Relating interventions to developmental findings. *Development and Psychopathology*, *5*, 243–262.
- Reid, J. B., Eddy, J. M., Fetrow, R. A., & Stoolmiller, M. (1999). Description and immediate impacts of a preventive intervention for conduct problems. *American Journal of Community Psychology*, *27*, 483–518.
- Reid, M. J., Webster-Stratton, C., & Hammond, M. (2003). Follow-up of children who received the incredible years intervention for oppositional defiant disorder: Maintenance and prediction of 2-year outcome. *Behavior Therapy*, *34*, 471–491.
- Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology*, *21*, 491–511.
- Robins, L. N. (1991). Conduct disorder. *Journal of Child Psychology and Psychiatry*, *32*, 193–212.
- Rogosa, D., Brandt, D., & Zimowski, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin*, *92*, 726–748.
- Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, *116*, 55–74.
- Shaw, D. S., Gilliom, M., Ingoldsby, E. M., & Nagin, D. S. (2003). Trajectories leading to school-age conduct problems. *Developmental Psychology*, *39*, 189–200.
- Shaw, D. S., & Winslow, E. B. (1997). Precursors and correlates of antisocial behavior from infancy to preschool. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 148–158). New York: Wiley.
- Shores, R. E., Gunter, P. L., & Jack, S. L. (1993). Classroom management strategies: Are the setting events for coercion? *Behavioral Disorders*, *18*, 92–102.
- Silverthorn, P., & Frick, P. J. (1999). Developmental pathways to antisocial behavior: The delayed-onset pathway in girls. *Development and Psychopathology*, *11*, 101–126.
- Silverthorn, P., Frick, P. J., & Reynolds, R. (2001). Timing of onset and correlates of severe conduct problems in adjudicated girls and boys. *Journal of Psychopathology and Behavioral Assessment*, *23*, 171–181.

- Underwood, M. K. (2003). *Social aggression among girls*. New York: Guilford.
- Van Acker, R., Grant, S. H., & Henry, D. (1996). Teacher and student behavior as a function of risk for aggression. *Education and Treatment of Children, 19*, 316–334.
- Walker, H. M., Severson, H. H., Feil, E. G., Stiller, B., & Golly, A. (1998). First step to success: Intervening at the point of school entry to prevent antisocial behavior patterns. *Psychology in the Schools, 25*, 259–269.