



Published in final edited form as:

Soc Dev. 2009 August 1; 18(3): 511–535. doi:10.1111/j.1467-9507.2008.00520.x.

Family, Neighborhood, and Peer Characteristics as Predictors of Child Adjustment: A Longitudinal Analysis of Additive and Mediation Models

Abstract

The purpose of this study was to test direct, additive, and mediation models involving family, neighborhood, and peer factors in relation to emerging antisocial behavior and social skills. Neighborhood danger, maternal depressive symptoms, and supportive parenting were assessed in early childhood. Peer group acceptance was measured in middle childhood, and data on antisocial behavior and social skills were collected when boys were 11 and 12 years old. Results were consistent with an additive effects model of child antisocial behavior. In contrast, peer relationships were stronger predictors of social skills than were family factors. Support for mediation was found in models involving neighborhood danger and supportive parenting. However, only peer group acceptance predicted change in antisocial and prosocial behavior. Implications for family and peer relations as socialization contexts are discussed.

Keywords

parent-child relations; peer relationships; antisocial behavior; social skills

The importance of family and peer relationships as contexts for socialization has been established in numerous investigations (for reviews see Bugental & Grusec, 2006; Rubin, Bukowski, & Parker, 2006). For instance, multiple family and neighborhood characteristics have been linked to children's behavioral adjustment, such as parenting (e.g., Laible & Thompson, 2007), parental adjustment (e.g., Wright, George, Burke, Gelfand, & Teti, 2000), and neighborhood violence (e.g., Leventhal & Brooks-Gunn, 2000). In addition, research has found significant associations between positive and negative peer relationships and child developmental outcomes, such as antisocial behavior and social skills (e.g., Criss, Pettit, Bates, Dodge, & Lapp, 2002; Mize & Pettit, 1997). This research has stimulated interest regarding the interplay among family, neighborhood, peer, and child factors, with particular attention to additive and mediation models (e.g., Ladd & Pettit, 2002). For instance, there has been debate in the field regarding the relative importance of family and peer relationships in shaping child development with some social scientists emphasizing early family experiences (e.g., Laible & Thompson, 2007), other authors attributing a greater role to peer group relationships (e.g., Harris, 1995), and still others arguing that families and peers are both critical (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). In addition to additive effects, other researchers have speculated that peer relationships may mediate the link between family/neighborhood factors and child adjustment (e.g., Mazefsky & Farrell, 2005; Roosa et al., 2005). While preliminary support for additive and mediation effects models has been found, much of the extant literature has been based on cross-sectional or short-term longitudinal studies using middle-class families with few long-term, prospective investigations with high-risk samples. One goal of this study was to examine whether family, neighborhood, and peer factors served as additive or incremental predictors of child adjustment. In addition, we explored whether peer relationships in middle childhood

mediated the link between family and neighborhood characteristics in early childhood and behavioral adjustment in early adolescence.

Families and Neighborhoods as Socialization Contexts

Researchers have posited that families and neighborhoods serve as crucial socialization contexts whereby children learn the rules and regulations necessary to become competent members of society (Steinberg, 1990). Acquisition of these competencies, such as behavioral and emotion regulatory skills, has been hypothesized to occur through multiple processes, including observational learning, parental instruction, and daily interactions with neighbors and family members (Bugental & Grusec, 2006). Factors that facilitate or hinder child internalization of these competencies have been a subject of considerable study. This research has indicated that socialization efforts characterized by high levels of parental support, responsiveness, and minimal use of power are more effective at facilitating the internalization of behavioral and emotional competencies compared to parenting styles that are reactive, harsh, and hostile (Kochanska & Thompson, 1997). For instance, Bates, Luster, and Vandenberg (2003) reported that high levels of supportive parenting (i.e., HOME total score) at 36 months were significantly related to high levels of social skills and low levels of behavior problems in the first grade. Pettit, Bates, and Dodge (1997) found that high levels of harsh discipline at age 5 were significantly related to high levels of externalizing behavior and low levels of social skills at age 11 after controlling for gender, ethnicity, and initial adjustment.

While parent-child interactions afford children opportunities to acquire critical behavioral and emotional competencies, there are other important factors within the family. For example, research suggests that highly depressed parents are often unresponsive and psychologically unavailable or intrusive and hostile during interactions with their young children (Shaw et al., 2006). Furthermore, evidence has demonstrated poorer developmental outcomes for children of mothers with high rates of depressive symptoms compared to others. For instance, Hammen and colleagues (1987) reported that maternal depressive symptoms were positively related to child behavior problems in families with children ages 8–16 years. Wright and colleagues (2000) reported that children whose mothers had a history of clinical depression were rated by teachers as having higher levels of externalizing problems and lower levels of social skills compared to others. In sum, these findings suggest that high rates of maternal depressive symptoms may be linked to a host of negative child outcomes, including prosocial and antisocial behavior.

Children's early socialization experiences also are embedded within a set of distal contextual factors, such as neighborhood characteristics (Bronfenbrenner, 1979; Capaldi, DeGarmo, Patterson, & Forgatch, 2002; Ingoldsby & Shaw, 2002; Leventhal & Brooks-Gunn, 2000). The quality of neighborhoods is thought to influence children directly through their exposure to the attitudes and behavior of peers and adults in the surrounding community (Ingoldsby & Shaw, 2002) and indirectly through the impact that neighborhoods have on parents (e.g., increase in stress, disruption of parenting; Capaldi et al., 2002), with direct associations on child outcomes becoming more evident as children reach school-age (Ingoldsby & Shaw, 2002). Accumulation of research has indicated links between neighborhood traits and child adjustment. O'Neil, Parke, and McDowell (2001) reported that maternal impressions of poor neighborhood quality (i.e., impoverished, lack of social control) were related to low levels of child social skills in middle childhood. Using census tract data, Beyers, Bates, Pettit, and Dodge (2003) reported that poor neighborhood quality (i.e., high residential instability, high structural disadvantage, low concentrated affluence) was significantly related to high levels of externalizing behavior at ages 11, 12, and 13

years. In sum, there is consistent evidence to suggest that exposure to impoverished and dangerous neighborhoods is associated with poor adjustment outcomes for children.

Peer Relationships as Socialization Contexts

In addition to the family and neighborhood factors, researchers have explored children's peer relationships as contexts for socialization (Hartup, 1996; Ladd, 1999). One peer construct that has been examined extensively in the literature is peer group acceptance, which reflects the level of collective liking or fondness in a peer group for a particular child (Parker & Asher, 1987). Peer acceptance is said to foster a sense of companionship and connection to the larger group (Ladd & Kochenderfer, 1996). Moreover, children's interactions in peer groups have been identified as important opportunities for learning antisocial behavior (i.e., "deviancy training"; Capaldi, Dishion, Stoolmiller, & Yoerger, 2001) and prosocial skills (Ladd, 1999). For instance, using a sample of preschoolers, Mize and Pettit (1997) reported that high levels of peer acceptance were significantly related to high levels of social skills and low levels of child aggression. In addition, Criss et al. (2002) found that peer group acceptance in kindergarten and first grade was negatively related to child externalizing behavior in the second grade. Thus, positive peer relationships appear to be important contexts for the development of antisocial behavior and social skills.

Additive Models

With a body of evidence demonstrating family, neighborhood, and peer factors to be related to multiple domains of child adjustment, some researchers have proposed additive models (see Figure 1), in which individual risk factors are hypothesized to make unique contributions to children's socio-emotional development after accounting for each variable's contribution (e.g., Ingoldsby, Shaw, Winslow, Schonberg, & Criss, 2006; Schwartz, Hopmeyer-Gorman, Toblin, & Abou-Ezzeddine, 2003). Testing additive models is critical in that it affords valuable information regarding the unique contribution of a particular variable in predicting child adjustment above and beyond the influence of other putative factors. Testing additive models is especially pertinent because of the recent debate regarding the relative importance of family, neighborhood, and peer factors in the prediction of child adjustment. Some investigators have placed a greater emphasis on early childhood experiences in the family and neighborhood – especially parent-child relationships – in shaping child development (e.g., Laible & Thompson, 2007). According to this perspective, poor child outcomes would be expected if certain developmental needs are not met during early childhood, an idea consistent with the concept of critical periods. In contrast, others have proposed that peer groups during middle childhood and adolescence are more paramount than early childhood family and neighborhood factors in shaping children's adjustment (Harris, 1995). Authors adopting this viewpoint argue that child outcomes are due primarily to the quality of daily interchanges in peer groups. Finally, a third perspective posits that families, neighborhoods, and peer group relationships are all important socialization contexts during childhood and adolescence (Collins et al., 2000).

Research that has addressed these competing viewpoints is limited as there have been very few (if any) published studies that have the ability to test this model with measures of family or neighborhood factors in early childhood and indicators of peer relationships in middle childhood. In addition, evidence from the literature is far from conclusive. For example, using a sample of children in grades 3–5, Schwartz et al. (2003) found that mutual antipathy (but not community violence) served as a significant and incremental predictor of child aggression whereas community violence (but not mutual antipathy) was incrementally related to child social skills (i.e., assertiveness). Criss and colleagues (2002) reported that both family adversity (age 5; i.e., ecological disadvantage, marital violence, and harsh

discipline) and peer relationships (ages 6 and 7; i.e., friendship and peer group acceptance) were significant predictors of externalizing behavior (age 8) when examined concomitantly. In a study examining developmental trajectories of antisocial behavior in middle childhood, Ingoldsby and colleagues (2006) reported that affiliation with deviant peers (but not neighborhood danger) significantly and incrementally distinguished children exhibiting moderate and increasing levels of antisocial behavior from those exhibiting low and decreasing levels. While these studies provide preliminary evidence for additive effects models, long-term, prospective studies, spanning from early childhood to early adolescence are needed. In the current investigation, we examined whether early childhood factors in the family and surrounding neighborhood (i.e., neighborhood dangerousness, maternal depression, supportive parenting) and peer relationships in middle childhood (i.e., peer group acceptance) were significant and incremental predictors of child adjustment in early adolescence (i.e., antisocial behavior, social skills).

Mediation Models

Researchers also have tested mediation models (see Figure 1) involving family, neighborhood, peer, and child factors (e.g., Mazefsky & Farrell, 2005; Roosa et al., 2005). Such models help advance the literature by elucidating the underlying mechanisms and specific developmental pathways linking two variables (Baron & Kenny, 1986). In other words, they provide information regarding *why* two variables are associated. Investigations that have explored whether the link between family/neighborhood factors and child adjustment is mediated or explained by peer factors have been based on the premise that families and the surrounding neighborhoods serve as training grounds for the development of peer relationships (Englund, & Sroufe, 1992; Ladd & Pettit, 2002) and that the quality of peer affiliations would account for associations between early family/neighborhood factors and later child outcomes. Thus, children who have had positive socialization experiences at home and in the surrounding neighborhood would be expected to have supportive and successful peer relationships, which in turn, would be linked to more adaptive behavioral outcomes, such as low levels of antisocial behavior and high levels of social skills. Alternatively, exposure to aggressive and acrimonious environments would be associated with the inability to form adaptive peer relationships which in turn, would be linked to poor child outcomes (Patterson, Reid, & Dishion, 1992). There is evidence in the literature that peer relationships may mediate or explain the association between family factors and child adjustment. For instance, Dishion, Eddy, Haas, Li, and Spracklen (1997) found that the link between effective parental discipline (assessed at ages 9–12) and adolescent violence and police contacts (assessed at ages 13–18) was no longer significant after controlling for deviancy training in the peer group (assessed at ages 13–18). In a cross-sectional study of ninth graders, Mazefsky and Farrell (2005) reported that the link between family support and adolescent aggressive behavior was mediated by peer provocation; direct and indirect associations were found between poor parenting and aggression. Using a cross-sectional sample of children in grades 4–6, Roosa et al. (2005) found that the relation between neighborhood risk (i.e., criminal events, poor neighborhood quality) and child externalizing behavior was significantly mediated by affiliation with deviant peers. In sum, the available evidence suggests that peer relationships may account for the link between family/neighborhood factors and child adjustment. However, no research of which we are aware has tested whether peer quality in middle childhood mediates associations between family and neighborhood factors in early childhood and antisocial and prosocial outcomes in adolescence.

Summary of Research Goals and Hypotheses

While the extant literature has demonstrated the importance of family, neighborhood, and peer experiences in shaping child adjustment, research testing additive and mediating effects models involving these factors has been less than conclusive. Moreover, this area of research has four major limitations. First, most studies that have examined additive and mediating effects have been conducted with predominantly middle-class families, thereby decreasing their applicability to children at risk for serious problematic outcomes. Second, most research in this area has adopted either cross-sectional or short-term longitudinal designs with few, if any, long-term prospective studies. This issue is critical to testing the validity of additive and mediation models, as ideally early socialization experiences would need to be measured in early childhood, peer relationships measured in middle childhood, and child outcomes measured in adolescence. To the best of our knowledge, no studies of this type exist. Third, much of the research (especially studies testing mediation effects) has focused on the antisocial aspects of peer relationships and child outcomes, with little or no attention to prosocial components of peer relationships (e.g., positive peer relationships) and dimensions of child adjustment (e.g., social skills). Fourth, few studies in this area have explored additive and mediation models while controlling for continuity in child adjustment.

There were three major goals in the current longitudinal investigation. First, we examined whether family and neighborhood factors in early childhood and peer relationships in middle childhood were related to child adjustment in early adolescence. The selection of the early childhood family and neighborhood factors (i.e., neighborhood dangerousness, maternal depression, supportive parenting) was based on Bronfenbrenner's (1979) ecological framework, which suggests that child adjustment likely is shaped by both proximal factors in the home (e.g., parenting) and more distal community factors (e.g., neighborhood quality). In addition, we assessed peer group acceptance at a summer camp in middle childhood (see Dodge, 1983; Elicker et al., 1992 for similar programs). Prior adjustment (i.e., antisocial behavior, social skills) was assessed in early, and middle childhood and adolescent behavioral outcomes were measured at ages 11 and 12. It was hypothesized that positive socialization experiences in the family and surrounding neighborhood (i.e., low neighborhood danger and maternal depressive symptoms and high supportive parenting) and positive peer relationships (i.e., high peer group acceptance) would be associated with adaptive early adolescent outcomes (i.e., low antisocial behavior, high social skills). A second goal was to test the validity of an additive effects model by examining whether family, neighborhood, and peer factors contributed unique variance in the prediction of early adolescent adjustment. Given that research has shown both families and peers to serve as contexts for deviancy training (e.g., Capaldi et al., 2001; Patterson et al., 1992), it was expected that both relational contexts would be incrementally related to antisocial behavior. Regarding social skills, we hypothesized that peer group acceptance would serve as a stronger predictor than family/neighborhood factors as the horizontal and balanced interactions of peer relationships (Laursen & Bukowski, 1997) may be more conducive for learning social skills. For the final research goal, we examined whether the link between early childhood family and neighborhood experiences and child adjustment in early adolescence would be mediated by peer relationships in middle childhood. Based on the premise that associations between family experiences and antisocial and prosocial outcomes would be explained by the quality of peer relations, we expected to find some evidence for the mediation model. However, we did not anticipate that the results would differ for models examining antisocial behavior and social skills as the evidence from the literature has not suggested distinct pathways. We also tested alternative additive and mediation models where we statistically controlled for continuity in child adjustment. Although few published longitudinal studies have tested additive and mediation models involving family, neighborhood, and peer factors while controlling for continuity in child adjustment, we

expected to find continued support for each model with prior child adjustment entered as a covariate.

Method

Participants

The sample consisted of families from the Pitt Mother & Child Project (PMCP), an ongoing longitudinal project examining vulnerability and resilience in low-income boys (e.g., Ingoldsby et al., 2006). Boys rather than girls were selected because of the former's higher rates of serious antisocial behavior in later childhood and adolescence, a primary focus of the study. Over a period of two years, the sample was recruited from low-income families who were participants in the Women, Infants, and Children (WIC) Nutritional Supplement Program in Pittsburgh, Pennsylvania, USA. The WIC program provides monetary supplements to purchase food for income-eligible families from pregnancy until children are 5 years old. The initial sample consisted of 310 families with 1½ year old sons (51.3% European American, 39.2% African American, .3% Hispanic, 9.2% other; 33% single parent-headed families; mothers' M age = 27.82, SD = 5.3; M family yearly income = \$12,567, SD = 7,689.02). The mean Hollingshead (1979) socioeconomic status was 23.32 (SD = 9.29). Because families were recruited over a period of two years, the initial assessment at age 1½ years and all subsequent laboratory and home assessments (ages 2, 3½, 5, 5½, 6, 8, 10, 11, and 12 years) were scheduled across two years to ensure that the children were the same age when the data were collected.

In the 9th year of the PMCP, children were invited to participate in a two-week summer camp that was designed to examine children's behavioral and social competencies. Children were assigned to one of three camp sessions, each of which was held for ten days across a two-week period. At each session, there were four to five separate groups, each comprised of 10–12 children and guided by two counselors who were college students and had received training in behavioral management strategies. Activities were typical of YMCA-administered camps, including arts and crafts, small and large group games, skits, field trips, free play, and swimming. Because of the concern about contagion effects (Dishion, McCord, & Poulin, 1999), no more than two children were placed in the same group who demonstrated a history of clinically-meaningful externalizing scores, based on mother and teacher reports at ages 5, 6, and 8 years. In addition, children of different ages were assigned evenly among the different groups to ensure heterogeneity in child age. We also made every effort to ensure that children in each group had not previously met. Based on counselor impressions, we had to assign 3–4 children to other groups due to previous contact with another group member. The camp subsample consisted of 146 boys (46.5% European American, 42.5% African American, 11% other; 34.9% single-parent headed families). Camp attendance fluctuated from day to day ranging from 75 (due to a holiday in one session) to 141. Because the sample initially was recruited over a period of two years, children ranged in age from 8.2 to 10.7 years (M = 9.6, SD = .55). It should be stressed that most of the boys in the PMCP who were unable to attend the summer camp due to previous plans (e.g., family trips) continued to participate in subsequent home and laboratory assessments. For instance, data were collected from 259 families (83.5% of original sample) at the age 11 assessment.

Overview

Family and neighborhood factors were assessed during home and laboratory assessments at ages 1½, 2, 3½, and 5 years. Prior child adjustment was based on data collected at ages 2–8 years. The peer relationship data came from sociometric interviews that were held on

Fridays of both weeks of camp. Child behavior was based on mother, teacher, and child reports at ages 11 and 12 years.

Measures: Antecedents

Using a 3-point Likert scale (1 = “not a problem,” 2 = “somewhat a problem,” 3 = “big problem”), mothers rated the extent to which activities such as prostitution, vandalism, illicit drug use, and gambling were problematic in their neighborhoods (Pittsburgh Youth Study, 1991). Separate *neighborhood dangerousness* scores at ages 2 ($\alpha = .95$; $M = 25.96$, $SD = 8.70$) and 5 ($\alpha = .94$; $M = 25.73$, $SD = 8.73$) years were created by summing the 17 items. The final factor was based on the mean ($r = .62$, $p < .001$) of the two scores.

Maternal depressive symptomatology was measured using the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988) which assesses symptoms and characteristic attitudes of depression that are rated on a 4-point scale ranging from 0 to 3. The BDI is a well-established and widely used measure of depressive states. Separate maternal depressive symptomatology scores at ages 1½ ($\alpha = .83$, $M = 9.00$, $SD = 6.88$), 2 ($\alpha = .83$, $M = 7.59$, $SD = 6.28$), 3½ ($\alpha = .87$, $M = 7.21$, $SD = 6.91$), and 5 ($\alpha = .85$, $M = 7.90$, $SD = 6.75$) years were created by summing the 21 items. The final composite was created by averaging scores across the four data points ($\alpha = .85$), with data being required from at least two time points.

Supportive parenting was assessed at age 2 years using the Home Observation for Measurement of the Environment (HOME; Caldwell & Bradley, 1984), an instrument that taps the quality and quantity of support and stimulation in the home based on data from parent interviews and observer post-assessment ratings. The 40 HOME items are rated either “yes” or “no” and encompass six dimensions: emotional and verbal responsiveness (e.g., “Parent spontaneously praises the child at least twice.”), acceptance of child’s behavior (e.g., “Parent does not shout at child.”), organization of environment (e.g., “Child’s play environment is safe.”), provision of play materials (e.g., “Learning equipment is appropriate for age.”), parental involvement with child (e.g., “Parent talks to child while doing household work.”), and opportunities for variety (e.g., “Child eats at least one meal per day with mother and father.”). The supportive parenting factor was based on the sum of the 40 HOME items ($\alpha = .82$).

Measures: Prior Child Adjustment

Prior antisocial behavior was based on mother and teacher reports of externalizing behavior. Mothers completed two versions of the Child Behavior Checklist (CBC): ages 2–3 (Achenbach, 1992) and ages 4–18 (Achenbach, 1991). Both instruments contain items tapping externalizing and internalizing behavior, although some of items vary across versions to account for developmental change within these factors. Teacher reports of externalizing behavior were based on the Teacher Report Form (TRF; Achenbach, 1991). Items on the externalizing behavior subscales of the TRF (33 items) and both versions of the CBC (26 and 33 items for ages 2–3 and ages 4–18 versions, respectively) were rated on a 3-point scale (0 = “not true,” 1 = “somewhat true,” 2 = “very true”). CBC scores at ages 2 ($\alpha = .87$; $M = 16.47$, $SD = 7.30$), 3½ ($\alpha = .89$; $M = 16.00$, $SD = 7.83$), 5 ($\alpha = .88$; $M = 13.86$, $SD = 7.97$), 5½ ($\alpha = .89$; $M = 12.76$, $SD = 7.91$), 6 ($\alpha = .89$; $M = 13.05$, $SD = 8.00$), and 8 ($\alpha = .90$; $M = 10.44$, $SD = 7.67$) were standardized (due to different number of items on the two versions) and averaged ($\alpha = .89$) to create the mother-reported component ($M = -.03$, $SD = .81$). The teacher-reported factor ($M = 9.37$, $SD = 9.64$) was based on the mean ($\alpha = .86$) of scores from ages 5 ($\alpha = .94$; $M = 7.54$, $SD = 9.25$), 6 ($\alpha = .94$; $M = 9.32$, $SD = 10.66$), 7 ($\alpha = .95$; $M = 9.92$, $SD = 11.29$), and 8 ($\alpha = .95$; $M = 9.43$, $SD = 11.28$). The mother and teacher scores were standardized and averaged ($r = .35$, $p < .001$) to create the final prior antisocial behavior factor.

Prior social skills was based on the mean ($r = .24, p < .001$) of mother and teacher reports on the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), an instrument that has demonstrated good reliability and validity. Items for the total social skills factor (38 and 30 items for mother and teacher versions, respectively) are rated on a three-point scale ranging from 0 (“never”) to 2 (“very often”). The mother report of social skills composite ($M = 46.77, SD = 9.69$) was based on the mean ($r = .65, p < .001$) of scores at ages 5 ($\alpha = .88; M = 45.30, SD = 10.31$) and 6 ($\alpha = .89; M = 48.24, SD = 10.27$). The teacher reported factor ($M = 37.76, SD = 9.09$) was based the mean ($\alpha = .93$) of data from ages 5 ($\alpha = .94; M = 39.84, SD = 10.68$), 6 ($\alpha = .92; M = 36.90, SD = 11.50$), 7 ($\alpha = .93; M = 38.08, SD = 10.44$), and 8 ($\alpha = .93; M = 37.88, SD = 10.75$).

Measures: Children’s Peer Relationships

Individual sociometric interviews were administered in each group on Fridays during both weeks of camp based on a procedure developed by Coie, Dodge, and Coppotelli (1982). Studies using the sociometric interview often administer the measure in school classrooms after children have known peers for several months or even years (e.g., Criss et al., 2002). However, it was not economically feasible to hold the summer camp for such a length of time while ensuring the desired number of participants. Moreover, we believed that a total of 80 hours (40 hours per week) afforded children sufficient experiences to identify peers they liked and disliked. During the sociometric interview, children were presented with a roster of children in their group and were asked to make a series of ratings and nominations. First, children were asked to rate the extent to which they liked each peer on a 3-point scale (0 = “doesn’t like,” 1 = “likes OK,” 2 = “like a lot”). Children also nominated up to three peers in their group who best characterized 14 attributes (e.g., “threaten to beat others up,” “are usually shy”). The nomination procedure was not mutually exclusive as children were allowed to nominate any peer for each of the 14 categories. For the current investigation, we focused on two characteristics: “like most” and “like least.”

Peer group acceptance reflects the child’s standing in the broader peer group. This score was created by standardizing and averaging ($r = .75, p < .001$) the mean peer rating and social preference scores. Mean peer rating (i.e., the average rating each child received from peers in his group) for weeks one ($M = 1.31, SD = .37$) and two ($M = 1.18, SD = .44$) were averaged ($r = .71, p < .001$) to create the composite. Social preference reflected the standardized difference between the “like most” and “like least” nominations scores. The social preference factor was based on the mean ($r = .64, p < .001$) of scores from weeks one ($M = .00, SD = 1.66$) and two ($M = .00, SD = 1.68$). Our decision to create the peer group acceptance factor using both sociometric ratings and nominations was based on two factors. First, we found no clear consensus in the literature whether ratings or nominations are preferable. Second, it was believed that using both scores would create a more robust and generalizable factor.

Measures: Early Adolescent Adjustment (Ages 11 and 12 Years)

Early adolescent antisocial behavior and social skills were measured at ages 11 and 12 years. *Antisocial behavior* was based on mother, teacher, and child reports. Mother and teacher reports of delinquent behavior were assessed using the CBC and TRF, respectively (Achenbach, 1991). Items on the delinquent behavior subscales (11 and 9 in the CBC and TRF, respectively) were rated on a 3-point scale (0 = “not true,” 1 = “somewhat true,” 2 = “very true”). CBC scores at ages 11 ($\alpha = .71; M = 2.08, SD = 2.26$) and 12 ($\alpha = .75; M = 2.00, SD = 2.45$) years were averaged ($r = .76, p < .001$) to create the mother-reported delinquent behavior component ($M = 2.00, SD = 2.29$). Likewise, the TRF delinquent behavior composite ($M = 4.25, SD = 3.74$) was based on the mean ($r = .53, p < .001$) of scores from ages 11 ($\alpha = .85; M = 4.34, SD = 4.16$) and 12 ($\alpha = .80; M = 3.84, SD = 3.43$).

Child report of antisocial behavior (10 items) was evaluated using an abbreviated version of the Self-report of Delinquency questionnaire (SRD; Elliott, Huizinga, & Ageton, 1985). Using a 3-point rating scale (1 = “never,” 2 = “once/twice,” 3 = “more often”), children rated the extent to which they engaged in different types of antisocial behaviors (e.g., stealing, throwing rocks at people). Several substance-use items that have extremely low base rates at these ages (e.g., intravenous drug use) were deleted from the scale. The child report of antisocial behavior composite ($M = 1.81$, $SD = 1.94$) was based on the mean ($r = .57$, $p < .001$) of scores at ages 11 ($\alpha = .69$; $M = 1.85$, $SD = 2.25$) and 12 ($\alpha = .71$; $M = 1.85$, $SD = 2.23$). Scores for mother, teacher, and child reports were standardized and averaged ($\alpha = .70$) to create the early adolescent antisocial behavior factor.

Early adolescent *social skills* was based on the mean ($r = .26$, $p < .001$) of mother and teacher reports on the SSRS. Data from the mother version (available only at age 11) were summed ($\alpha = .89$; $M = 51.78$, $SD = 10.29$) to create the composite. The teacher report of social skills composite ($M = 36.84$, $SD = 9.57$) was based on the mean ($r = .56$, $p < .001$) of scores at ages 11 ($\alpha = .93$; $M = 37.31$, $SD = 10.87$) and 12 ($\alpha = .91$; $M = 36.73$, $SD = 9.43$).

Analysis Plan

First, descriptive statistics and bivariate correlations among the study variables were computed. Second, a series of path models were estimated to explore additive and mediated effects on adolescent adjustment (antisocial behavior or social skills). In the four additive models, the adolescent adjustment variable was regressed simultaneously on the family, neighborhood, and peer relationship variables. These models were repeated controlling for prior child adjustment. Correlations between the independent variables were estimated in these four fully-saturated path models. Third, four mediation models were estimated. Again, two models controlled for prior child adjustment, and two models did not include the controls. In all mediation models, adolescent adjustment was regressed upon peer group acceptance, which was simultaneously regressed upon the three exogenous family and neighborhood factors. The independent variables were permitted to correlate in these models. The indirect effects of the family and neighborhood factors on adolescent adjustment via peer group acceptance also were estimated, and bootstrapping was employed in order to estimate the standard errors and 95% bias-corrected confidence intervals of these coefficients (McCartney, Burchinal, & Bub, 2006). All path analyses were conducted in M-Plus version 4.0 (Muthén & Muthén, 2004). Fit for non-saturated path models was considered acceptable if it had a non-significant chi-square fit statistic (χ^2), a Root Mean Square Error of Approximation smaller than .05, and a Standardized Root Mean Square Residual (SRMR) close to zero (Kline, 1998). Fit statistics for fully saturated models cannot be evaluated. When all possible paths and correlations are estimated, the model is assumed to fit the data perfectly.

It should be noted that we also tested additive and mediation models with latent constructs (i.e., Structural Equation Modeling) and got identical results. We chose to retain the path analyses with observed variables primarily because the sample size was insufficient for fitting such complex structural models, even when using the controversial strategy of parceling. A recommended benchmark is at least 10 cases per indicator (Kline, 1998). Thus, with 22 parceled indicators in the current study, a sample size of at least 2000 youth would be necessary to compute such an intricate structural model.

Missing Data

We examined patterns of missing data before addressing substantive research questions. This revealed that 146 families had peer group acceptance data. Further examination revealed that boys who had attended the summer camp during which peer group acceptance

was assessed tended to live in more dangerous neighborhoods ($M = 27.00$, $SD = 7.98$ for camp attendees, versus $M = 24.83$, $SD = 7.65$ for non-attendees; $F(1, 303) = 5.90$, $p < .05$), had higher levels of prior externalizing problems ($M = .14$, $SD = .78$ versus $M = -.15$, $SD = .74$; $F(1, 306) = 11.51$, $p < .01$), and poorer prior social skills ($M = -.09$, $SD = .84$ versus $M = .10$, $SD = .81$; $F(1, 293) = 4.08$, $p < .05$), than boys who did not attend the camp ($n = 164$). No other study variables or sample characteristics were associated with missing peer group acceptance data or adolescent adjustment variables. As this suggested data were missing at random (MAR), we employed full information maximum likelihood in model estimation procedures (Enders, 2001). This method is preferable to listwise deletion when data are MAR, as listwise deletion may produce biased model parameter estimates (McCartney et al., 2006).

Results

Descriptive Statistics and Bivariate Correlations

Descriptive statistics and bivariate correlations are listed in Table 1. Intercorrelations (two-tailed) among study variables indicated expected patterns of covariation within and between variable domains. Families who lived in more dangerous neighborhoods were characterized by significantly higher levels of maternal depressive symptomatology and lower levels of supportive parenting than those in less dangerous communities. High levels of maternal depressive symptoms were significantly related to low levels of supportive parenting. Finally, antisocial behavior and social skills were significantly and inversely related in both early/middle childhood and early adolescence.

Research Question #1: Direct Effects

For the first research goal, we were interested in longitudinal links between family/neighborhood and peer factors and adolescent adjustment. The bivariate correlations indicated that high levels of supportive parenting and low levels of neighborhood danger and maternal depressive symptoms in early childhood were significantly related to low levels of antisocial behavior and high levels of social skills in early adolescence. As indicated in Table 1, high peer group acceptance was significantly related to low levels of antisocial behavior and high levels of social skills in early adolescence.

Research Question #2: Additive Effects

The first research question indicated that family, neighborhood, and peer factors were significantly related to antisocial behavior and social skills in early adolescence. Next, we tested an additive effects model by examining whether the aforementioned variables incrementally predicted adolescent adjustment when examined simultaneously. In each model, neighborhood dangerousness, maternal depressive symptoms, supportive parenting, and peer group acceptance were examined simultaneously in the prediction of early adolescent adjustment (antisocial behavior or social skills). We also tested alternative models where prior child adjustment (antisocial behavior or social skills) was entered as an autoregressive factor.

In the first additive effects model, maternal depression, supportive parenting, and peer group acceptance were significantly and incrementally related to adolescent antisocial behavior in expected directions (see Table 2). The coefficient for neighborhood dangerousness was not significant. When antisocial behavior in early and middle childhood was entered in the model, however, only peer group acceptance and prior adjustment were significant predictors of antisocial behavior. Turning to the models examining predictors of social skills, the results showed that high levels of supportive parenting and peer group acceptance were significantly and incrementally related to adolescent social skills (see Table 2).

Neighborhood dangerousness and maternal depression were not significant predictors of social skills in this model. When the prior social skills factor was considered in the alternative model, peer group acceptance and prior adjustment were significantly and incrementally related to social skills in early adolescence; the supportive parenting factor was no longer significant.

In sum, evidence for the additive effects model was found in the prediction of adolescent adjustment, especially antisocial behavior. When prior child adjustment was entered into the model, however, only peer group acceptance served as a significant and unique predictor of antisocial and prosocial behavior.

Research Question #3: Mediation Effects

The correlations indicated that family and neighborhood factors in early childhood were significantly related to peer group acceptance in middle childhood, which in turn was significantly related to antisocial behavior and social skills in early adolescence. For the third research question, we tested mediation models to ascertain whether family and neighborhood factors were related to adolescent adjustment indirectly through positive peer relationships. In all mediation models, adolescent adjustment was regressed upon peer group acceptance, which was simultaneously regressed upon the three exogenous family and neighborhood variables. Correlations between the independent variables and their indirect effects on adolescent adjustment via peer group acceptance also were estimated. As in the additive effects models, we also tested alternative mediation models where prior child adjustment (antisocial behavior or social skills) was examined as a covariate.

We first tested indirect effects in the prediction of adolescent antisocial behavior. The model fit did not adequately fit the data, $\chi^2(3) = 19.48, p < .001$; RMSEA = .13; 90% RMSEA C.I. = .08–.19; SRMR = .06. As indicated in the top model in Figure 2, both neighborhood dangerousness and supportive parenting were significantly related to peer group acceptance in the expected directions. Maternal depression was unrelated to peer relationships. In addition, peer group acceptance was significantly and inversely related to adolescent antisocial behavior. As shown in Table 3, neighborhood dangerousness and supportive parenting exerted small but significant indirect effects through peer group acceptance. We also explored the type of mediation (i.e., full vs. partial) based on the recommendations of Little, Card, Bovaird, Preacher, and Crandall (2007). At the bivariate level, neighborhood dangerousness and supportive parenting were correlated with antisocial behavior and peer group acceptance (see Table 1). Inspection of the additive model in Table 2 indicated that the direct effect of neighborhood dangerousness was reduced to non-significance when peer group acceptance was included in the model. Likewise, the direct path from supportive parenting to adolescent antisocial behavior was weaker than the direct path of peer group acceptance. This evidence indicates that the effect of neighborhood dangerousness on adolescent antisocial behavior was fully mediated and the effect of supportive parenting was partially mediated (Little et al., 2007). We repeated the same model controlling for antisocial behavior in early and middle childhood. This model's fit approached acceptability, $\chi^2(4) = 25.52, p < .001$; RMSEA = .12; 90% RMSEA C.I. = .07–.17; SRMR = .06. The associations in the model remained essentially the same (see bottom model in Figure 2). However, controlling for prior antisocial behavior reduced the indirect effects for neighborhood dangerousness and supportive parenting to non-significance.¹

We next tested indirect effects in the prediction of social skills in early adolescence. This model fit the data acceptably, $\chi^2(3) = 6.90, p > .05$; RMSEA = .07; 90% RMSEA C.I. = .00–.13; SRMR = .03. The results indicated that high levels of peer group acceptance in middle childhood were significantly predicted by low levels of neighborhood dangerousness and high levels of supportive parenting in middle childhood (see top model in Figure 3).

Maternal depressive symptoms were unrelated to peer relations. Findings also demonstrated that the peer group acceptance factor was significantly and positively related to social skills in early adolescence. As indicated in Table 3, neighborhood dangerousness and supportive parenting made small, indirect contributions to adolescent social skills via peer group acceptance (see Table 3). We also investigated whether the links between early family and neighborhood experiences and adolescent social skills were fully or partially mediated (Little et al., 2007). Neighborhood dangerousness and supportive parenting were both correlated with social skills (see Table 1). The effect of neighborhood dangerousness was reduced to non-significance when peer group acceptance was included in the model (see Table 2). The coefficient for supportive parenting was reduced but remained significant. Similar to the results involving antisocial behavior, this evidence suggests that the effect of supportive parenting on social skills was partially mediated and the effects of neighborhood dangerousness was fully mediated. We repeated this model controlling for social skills in early and middle childhood. The model also fit the data acceptably, $\chi^2(4) = 12.65, p < .05$. RMSEA = .08; 90% RMSEA C.I. = .03–.14; SRMR = .05. Findings indicated that supportive parenting was significantly related to peer group acceptance, which in turn was related to adolescent social skills (see bottom model in Figure 3). In addition, the indirect effect of supportive parenting remained after controlling for prior social skills. That is, positive and supportive parenting in early childhood was related to social skills in early adolescence through peer affiliations in middle childhood. In contrast, the results indicated that neighborhood dangerousness and maternal depressive symptoms were not significantly related to peer group acceptance. Also, the indirect effect for neighborhood dangerousness was no longer significant after statistically controlling for prior social skills.

In summary, the findings demonstrated that family and neighborhood factors were indirectly related to adolescent adjustment through positive peer relationships. When prior child adjustment was entered as a covariate, however, evidence for indirect effects was found only in one case. Specifically, supportive parenting was related to adolescent social skills via peer group acceptance.

Discussion

The purpose of the current longitudinal study was to investigate direct, additive, and mediation models involving family, neighborhood, peer, and child factors. Findings indicated that positive family and neighborhood experiences in early childhood and supportive peer relationships in middle childhood were significantly related to low levels of antisocial behavior and high levels of social skills in early adolescence. Moreover, results demonstrated that both early family and later peer factors were significant and incremental predictors of antisocial behavior (i.e., additive effects model). In contrast, children's peer relationships were stronger predictors adolescent social skills compared to family and neighborhood variables. Evidence for mediation was found for neighborhood dangerousness and supportive parenting in the prediction of antisocial behavior and social skills. When prior adjustment was entered into the model as a covariate, however, only peer group acceptance was significantly related to adolescent adjustment. Overall, the findings suggest that children's socialization experiences in peer groups are paramount during the development of antisocial and prosocial behavior.

¹Although the output from Mplus does not provide modification suggestions, inspection of the model suggests that the fit may be reduced by the inclusion of the non-significant pathway from maternal depression to peer group acceptance. This model was retested without the link from maternal depression to peer group acceptance and with a direct path from maternal depression to antisocial behavior. This change in the model improved the fit: $\chi^2(3) = 8.21, p < .05$; RMSEA = .08 (90% C.I. = .01–.14); SRMR = .04. We made these changes in the model controlling for prior antisocial behavior and found a slight improvement in model fit: $\chi^2(4) = 19.62, p < .05$; RMSEA = .11 (90% C.I. = .06–.17); SRMR = .06. These results are consistent with the originally analyses suggesting that maternal depression is directly (and not indirectly) related to child antisocial behavior.

The first goal of this study was to analyze longitudinal links between family and peer factors and child adjustment. With an extensive body of research demonstrating the critical role that families and peers play in the socialization process (e.g., Bugental & Grusec, 2006; Rubin et al., 2006), it was expected that positive family and neighborhood experiences in early childhood and supportive peer relationships in middle childhood would be significantly related to adaptive behavioral adjustment in early adolescence. The results provided support for this hypothesis in that high levels of supportive parenting and low levels of neighborhood danger and maternal depressive symptoms in early childhood were significantly related to low levels of antisocial behavior and high levels of social skills in early adolescence. In addition, children who were accepted by their peer group in middle childhood displayed positive developmental outcomes in adolescence. Overall, these findings suggest that when investigated *individually*, family, neighborhood, and peer factors are critical predictors of antisocial and prosocial behavior.

For the second research question, we investigated whether family, neighborhood, and peer factors were significant and incremental predictors of antisocial behavior and social skills when examined *simultaneously*. The extant literature is characterized by several perspectives regarding the relative importance of these factors in the socialization process with some investigators emphasizing family or neighborhood experiences in early childhood (e.g., Laible & Thompson, 2007), other authors attributing a greater importance to peer group relationships in middle childhood and adolescence (e.g., Harris, 1995), and still others arguing that family, neighborhood, and peer relationship experiences are all critical (e.g., Collins et al., 2000). To address this research question, therefore, we examined whether family and neighborhood factors in early childhood and peer relationships in middle childhood were significant and incremental predictors of adolescent adjustment. With respect to adolescent antisocial behavior, the results indicated that both family and peer factors were significant predictors when analyzed simultaneously. These findings are in accord with the additive effects model and suggest that both families and peer groups may afford children unique socialization experiences at least when it comes to the development of antisocial behavior. This is also consistent with previous research identifying families and peer groups as contexts for deviancy training (e.g., Capaldi et al., 2001; Patterson et al., 1992). In contrast, and consistent with peer socialization models (i.e., Harris, 1995), peer relationships were more strongly related to social skills compared to family and neighborhood factors. One possible explanation for this finding may be the manner in which children interact with family members versus peers. Specifically, children's interactions within the family tend to be more vertical with greater control exerted by parents (Laursen & Bukowski, 1997; Russell, Pettit, & Mize, 1998). In contrast, exchanges between peers tend to be more horizontal, balanced, and reciprocal, an interactional style that may be more conducive for learning social skills. Another possible explanation for these findings is that peer group acceptance may be a marker of the children's skillfulness at forming positive relationships with unacquainted peers. In other words, the measures of peer group acceptance and social skills both may be indicators of social competence.

A third goal of the current investigation was to examine whether peer relationships mediated the links between early family and neighborhood factors and indices of adolescent adjustment. Consistent with previous research (e.g., Mazefsky & Farrell, 2005; Roosa et al., 2005), evidence for the mediation model was found: peer group acceptance in middle childhood mediated the associations between family/neighborhood factors in early childhood (i.e., neighborhood dangerousness, supportive parenting) and adolescent adjustment (i.e., antisocial behavior, social skills). These findings highlight one potential pathway linking family/neighborhood experiences to adolescent adjustment. Specifically, children's experiences in the family and surrounding neighborhoods appear to serve as important learning environments for skills that are essential for the formation of positive

peer affiliations (Elicker et al., 1992; Ingoldsby & Shaw, 2002; Ladd & Pettit, 2002). Furthermore, interactions with peers afford children important socialization experiences in development of antisocial and prosocial behaviors (Criss et al., 2002; Hartup, 1996; Ladd, 1999).

Two qualifications are worth noting, however. First, while the indirect effect was significant for supportive parenting, the magnitude of this effect was small, indicating that peer group acceptance did not explain all or most of the variance in the link between this early childhood factor and adolescent adjustment. That is, parenting in early childhood appears to be both directly and indirectly related to antisocial and prosocial behavior in early adolescence, which is consistent with the findings from the cross-sectional study by Mazefsky and Farrell (2005). Second, it should be noted that evidence for indirect effects was not found for maternal depressive symptoms. One possible explanation for this finding is that parenting may have mediated or explained the link between maternal depression and peer acceptance. Specifically, while the bivariate correlation between maternal depressive symptoms and positive peer relationships was significant, this link became non-significant when controlling for supportive parenting (see Figure 2 and Figure 3). This finding is in accord with research showing that parenting may mediate the association between maternal psychopathology and child adjustment (Hammen, 2003).

We also tested alternative additive and mediation models in which prior adjustment in early and middle childhood (antisocial behavior or social skills) was entered as a covariate. These findings indicated that peer group acceptance – but not family or neighborhood factors – was significantly and incrementally related to antisocial and prosocial behavior. These analyses also showed that the indirect effects involving neighborhood dangerousness and supportive parenting, in general, were no longer significant. One possible explanation for these findings is that while family and neighborhood factors were correlated with *initial levels* of antisocial behavior and social skills in early adolescence, these early childhood factors were not significantly related to *change* in adjustment over time. Furthermore, without significant direct effects, the chances of finding support for the additive or mediation models would have been less likely. These results also could be attributed to the timing of the prior adjustment factors. Namely, it would have been more preferable to statistically control for antisocial and prosocial behaviors that were assessed prior to the family and neighborhood factors (Heckman, Ichimura, Smith, & Todd, 1998; Huitema, 1980). As comparable indicators of antisocial behavior and social skills were not available prior to age 1½ years, we had to use factors that were assessed concurrently or subsequent to the indices of family and neighborhood experiences.

Nevertheless, it is impressive that peer group acceptance in middle childhood remained a significant predictor of two indices of adolescent adjustment after controlling for neighborhood dangerousness, maternal depressive symptoms, supportive parenting, and prior adjustment. There have been few long-term prospective studies that have demonstrated the incremental effects of peer relationships above and beyond the influence of family and neighborhood factors while statistically controlling for continuity in child adjustment (see Lansford, Criss, Pettit, Dodge, & Bates, 2003 for evidence from a short-term longitudinal study). These findings highlight the importance of peer relationships as critical socialization contexts during middle childhood (Criss et al., 2002; Hartup, 1996; Ladd, 1999). In particular, this study suggests that children's ability to establish positive and accepting relationships with age-mates during middle childhood may result in increases in prosocial behavior and decreases in antisocial behavior over time. As such, these findings have implications for interventionists, mental health specialists, and policy makers.

Conclusions, Limitations, and Suggestions for Future Research

One limitation of the study was that many participants in the ongoing longitudinal project were unable to attend the summer camp due to previous family plans. Attrition analyses indicated that compared to nonparticipating boys, children who attended the camp came from more dangerous neighborhoods and included boys with greater behavioral adjustment difficulties (i.e., high antisocial behavior, low social skills) in early to middle childhood. Despite this selective pattern of attrition, the findings from the current investigation were quite similar to previous studies using more middle-class samples, suggesting that similar processes may be involved. However, future studies are needed to replicate these findings in samples from other socioeconomic contexts. These findings also need to be replicated in samples that include girls as research has suggested that girls may spend more time with parents versus peers (Montemayor, 1983) and thus may be more likely than boys to be exposed to various indicators of family risk, such as maternal depression (Sheeber, Davis, & Hops, 2002). Thus, it is possible that family experiences may be more critical than peer relations in shaping the development of antisocial and prosocial behavior for girls compared to boys. Further research is needed to address this issue.

It should be noted that the selection of the study variables was not meant to be exhaustive, as there are several family (e.g., marital conflict), peer (e.g., peer victimization), and child (e.g., emotion regulation) factors that also could be tested. Furthermore, given the duration of the camp, it is likely that peer group acceptance may reflect only the initial stages of relationship development. Future investigations would benefit from an examination of peer relationships over a longer period of time. Another limitation of the study was that interrater reliability was not available for the interviewer ratings of parenting at age 2 years. Although the HOME measure has been used extensively in the literature for over two decades, having an index of interrater reliability would have been more preferable. Finally, given recent evidence suggesting that peer relationships may influence what goes on in the family (e.g., Ladd & Pettit, 2002), future studies could examine whether family factors mediate the link between peer relationships and child adjustment.

Despite the limitations, the current longitudinal study has contributed to the literature by examining the importance of family, neighborhood, and peer experiences in the development of antisocial and prosocial behavior. Evidence indicated that both family and peer experiences are critical in the development of antisocial behavior, whereas children's peer relationships were more strongly linked to social skills. The findings also demonstrated indirect effects involving neighborhood and parenting attributes in the prediction of antisocial behavior and social skills. Finally, the results indicated that after controlling for prior adjustment, only peer group acceptance was a significant predictor of change in antisocial behavior and social skills.

References

- Achenbach, T.M. Integrative guide for the 1991 CBCL 14–18, YSR, and TRF Profiles. Burlington, VT: University of Vermont, Department of Psychiatry; 1991.
- Achenbach, T.M. Manual for the Child Behavior Checklist/2–3 and 1992 profile. Burlington, VT: University of Vermont, Department of Psychiatry; 1992.
- Baron R.M., Kenny D.A. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51:1173–1182. [PubMed: 3806354]
- Bates L, Luster T, Vandenberg M. Factors related to social competence in elementary school among children of adolescent mothers. *Social Development*. 2003; 12:107–124.

- Beck AT, Steer RA, Garbin MG. Psychometric properties of the Beck Depression Inventory. Twenty-five years of evaluation. *Clinical Psychology Review*. 1988; 8:77–100.
- Beyers JM, Bates JE, Pettit GS, Dodge KA. Neighborhood structure, parenting processes, and the development of youths' externalizing behaviors: A multilevel analysis. *Journal of Community Psychology*. 2003; 31:35–53.
- Bronfenbrenner, U. *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press; 1979.
- Bugental, DB.; Grusec, JE. Socialization processes. In: Eisenberg, N.; Damon, W., editors. *Handbook of child psychology: Social emotional, and personality development*. 6th ed. Vol. 3. New York: Wiley; 2006. p. 366-428.
- Caldwell, BM.; Bradley, RH. *Home observation for measurement of the environment*. Little Rock, AR: University of Arkansas at Little Rock; 1984.
- Capaldi, DM.; DeGarmo, D.; Patterson, GR.; Forgatch, M. Contextual risk across the early life span and association with antisocial behaviour. In: Reid, JB.; Patterson, GR.; Snyder, J., editors. *Antisocial behaviour in children and adolescents: A developmental analysis and model for intervention*. Washington, DC: American Psychological Association; 2002. p. 123-145.
- Capaldi DM, Dishion TJ, Stoolmiller M, Yoerger K. Aggression toward female partners by at-risk young men: The contribution of male adolescent friendships. *Developmental Psychology*. 2001; 37:61–73. [PubMed: 11206434]
- Coie JD, Dodge KA, Coppotelli H. Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*. 1982; 18:557–570.
- Collins WA, Maccoby EE, Steinberg L, Hetherington EM, Bornstein MH. Contemporary research on parenting: The case for nature and nurture. *American Psychologist*. 2000; 55:218–232. [PubMed: 10717969]
- Criss MM, Pettit GS, Bates JE, Dodge KA, Lapp AL. Family adversity, positive peer relationships, and children's externalizing behavior: A longitudinal perspective on risk and resilience. *Child Development*. 2002; 73:1120–1237.
- Dishion TJ, Eddy JM, Haas E, Li F, Spracklen K. Friendships and violent behavior during adolescence. *Social Development*. 1997; 6:207–223.
- Dishion TJ, McCord J, Poulin F. When interventions harm: Peer groups and problem behavior. *American Psychologist*. 1999; 54:755–764. [PubMed: 10510665]
- Dodge KA. Behavioral antecedents of peer social status. *Child Development*. 1983; 54:1386–1399.
- Elicker, J.; Englund, M.; Sroufe, LA. Predicting peer competence and peer relationships in childhood from early parent-child relationships. In: Parke, RD.; Ladd, GW., editors. *Family-peer relationships: Modes of lineage*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1992. p. 77-106.
- Enders CK. A primer on maximum likelihood algorithms available for use with missing data. *Structural Equation Modeling*. 2001; 8:128–141.
- Gresham, FM.; Elliott, SN. *Social skills rating system manual*. Circle Pines, MN: American Guidance Service; 1990.
- Hammen C, Adrian C, Gordon D, Burge D, Jaenicke C, Hiroto D. Children of depressed mothers: Maternal strain and symptom predictors of dysfunction. *Journal of Abnormal Psychology*. 1987; 96:190–198. [PubMed: 3680756]
- Hammen, C. Risk and protective factors for children of depressed parents. In: Luthar, SS., editor. *Resilience and vulnerability: Adaptation in the context of childhood adversities*. New York: Cambridge University Press; 2003. p. 50-75.
- Harris JR. Where is the child's environment? A group socialization theory of development. *Psychological Review*. 1995; 102:458–489.
- Hartup WW. The company they keep: Friendships and their developmental significance. *Child Development*. 1996; 67:1–13. [PubMed: 8605821]
- Heckman J, Ichimura H, Smith J, Todd P. Characterizing selection bias using experimental data. *Econometrica*. 1998; 66:1017–1098.
- Hollingshead, AA. *Four-factor index of social status*. New Haven, CT: Unpublished manuscript, Yale University; 1979.

- Huitema, BE. *The analysis of covariance and alternatives*. New York: Wiley; 1980.
- Ingoldsby EM, Shaw DS. Neighborhood contextual factors and early-starting antisocial pathways. *Clinical and Family Psychological Review*. 2002; 5:21–55.
- Ingoldsby EM, Shaw DS, Winslow E, Schonberg M, Criss MM. Neighborhood disadvantage, parent-child conflict, neighborhood peer relationships, and early antisocial behavior problem trajectories. *Journal of Abnormal Child Psychology*. 2006; 34:303–319. [PubMed: 16705498]
- Kline, RB. *Principles and practice of structural equation modeling*. New York: Guilford; 1998.
- Kochanska, G.; Thompson, RA. The emergence and development of conscience in toddler-hood and early childhood. In: Grusec, JE.; Kuczynski, L., editors. *Parenting and children's internalization of values: A handbook of contemporary theory*. New York: Wiley; 1997. p. 53-77.
- Ladd GW. Peer relationships and social competence during early and middle childhood. *Annual Review of Psychology*. 1999; 50:333–359.
- Ladd, GW.; Kochenderfer, BJ. Linkages between friendship and adjustment during early school transitions. In: Bukowski, WM.; Newcomb, AF.; Hartup, WW., editors. *The company they keep*. New York: Cambridge University Press; 1996. p. 322-345.
- Ladd, GW.; Pettit, GS. Parenting and the development of children's peer relationships. In: Bornstein, MH., editor. *Handbook of Parenting Practical Issues of Parenting*. Second Edition. Vol. Volume 5. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers; 2002. p. 269-309.
- Laible, D.; Thompson, RA. Early socialization: A relationship perspective. In: Grusec, JE.; Hastings, PD., editors. *Handbook of socialization: Theory and research*. New York: The Guilford Press; 2007. p. 181-207.
- Lansford JE, Criss MM, Pettit GS, Dodge KA, Bates JE. Friendship quality, peer group affiliation, and peer antisocial behavior as moderators in the link between negative parenting and adolescent externalizing behavior. *Journal of Research on Adolescence*. 2003; 13:161–184. [PubMed: 20209019]
- Little, TD.; Card, NA.; Bovaird, JA.; Preacher, KJ.; Crandall, CS. Structural equation modeling of mediation and moderation with contextual factors. In: Little, TD.; Bovaird, JA.; Card, NA., editors. *Modeling contextual effects in longitudinal studies*. Mahwah, NJ: Erlbaum; 2007. p. 207-230.
- Laursen B, Bukowski WM. A developmental guide to the organization of close relationships. *International Journal of Behavioral Development*. 1997; 21:747–770. [PubMed: 20090927]
- Leventhal T, Brooks-Gunn J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*. 2000; 126:309–337. [PubMed: 10748645]
- Mazefsky CA, Farrell AD. The role of witnessing violence, peer provocation, family support, and parenting practices in the aggressive behavior of rural adolescents. *Journal of Child and Family Studies*. 2005; 14:71–85.
- McCartney K, Burchinal MR, Bub KL. Best practices in quantitative methods for developmentalists. *Monographs of the Society for Research in Child Development*. 2006; 71 (3, Serial No. 285).
- Mize J, Pettit GS. Mothers' social coaching, mother-child relationship style, and children's peer competence: Is the medium the message? *Child Development*. 1997; 68:312–332. [PubMed: 9180004]
- Montemayor R. Parents and adolescents in conflict: All of the families some of the time and some of the families most of the time. *Journal of Early Adolescence*. 1983; 3:83–103.
- Muthén, LK.; Muthén, BO. *Mplus user's guide*. 3rd Ed.. Los Angeles, CA: Muthén & Muthén; 2004.
- O'Neil R, Parke RD, McDowell DJ. Objective and subjective features of children's neighborhoods: Relations to parental regulatory strategies and children's social competence. *Applied Developmental Psychology*. 2001; 22:135–155.
- Parker JG, Asher SR. Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin*. 1987; 102:357–389. [PubMed: 3317467]
- Patterson, GR.; Reid, JB.; Dishion, TJ. *A social interactional approach: Antisocial boys*. Vol. Vol. 4. Eugene, OR: Catalia Press; 1992.
- Pettit GS, Bates JE, Dodge KA. Supportive parenting, ecological context, and children's adjustment: A seven-year longitudinal study. *Child Development*. 1997; 68:908–923.

- Neighborhood Dangerousness Scale. Unpublished measure: University of Pittsburgh; 1991. Pittsburgh Youth Study.
- Roosa MW, Deng S, Ryu E, Burrell GL, Tein J, Jones S, Lopez V, Crowder S. Family and child characteristics linking neighborhood context and child externalizing behavior. *Journal of Marriage and Family*. 2005; 67:515–529.
- Rubin, KH.; Bukowski, W.; Parker, JG. Peer interactions, relationships, and groups. In: Eisenberg, N.; Damon, W., editors. *Handbook of child psychology: Social emotional, and personality development*. 6th ed.. Vol. Vol. 3.. New York: Wiley; 2006. p. 571-645.
- Russell A, Pettit GS, Mize J. Horizontal qualities in parent-child relationships: Parallels with and possible consequences for children's peer relationships. *Developmental Review*. 1998; 18:313–352.
- Schwartz, D.; Hopmeyer-Gorman, A.; Toblin, RL.; Abou-Ezzeddine, T. Mutual antipathies in the peer group as a moderating factor in the association between community violence exposure and psychological adjustment. In: Hodges, EVE.; Card, NA., editors. *Enemies and the darker side of peer relations: New directions for child and adolescent development*, No. 102. San Francisco: Jossey-Bass; 2003. p. 39-54.
- Shaw DS, Schonberg M, Sherrill J, Huffman D, Lukon J, Obrosky D, Kovacs M. Responsivity to offspring's expression of emotion among childhood-onset depressed mothers. *Journal of Clinical Child and Adolescent Psychology*. 2006; 35:540–552.
- Sheeber, L.; Davis, B.; Hops, H. Gender-specific vulnerability to depression in children of depressed mothers. In: Goodman, SH.; Gotlib, IH., editors. *Children of depressed parents: Mechanisms of risk and implications for treatment*. Washington, DC: American Psychological Association; 2002. p. 253-274.
- Steinberg, L. Autonomy, conflict, and harmony in the family relationship. In: Feldman, SS.; Elliott, GR., editors. *At the threshold: The developing adolescent*. Cambridge, MA: Harvard University Press; 1990. p. 255-276.
- Wright CA, George TP, Burke R, Gelfand DM, Teti DM. Early maternal depression and children's adjustment to school. *Child Study Journal*. 2000; 30:153–168.

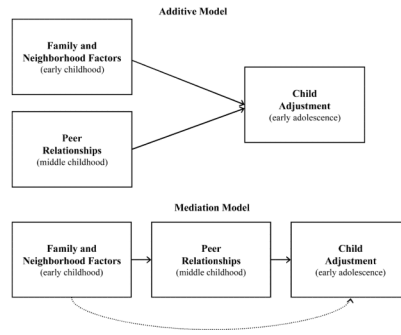


Figure 1. Additive and mediation models involving family, neighborhood, peer, and child factors

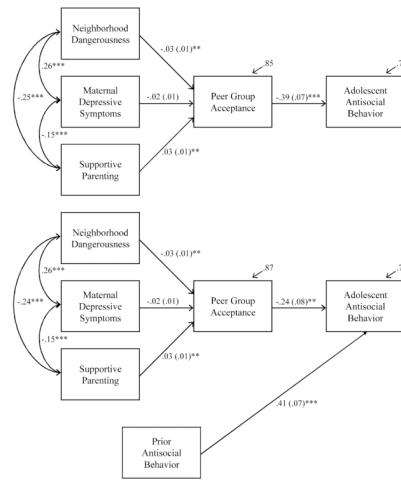


Figure 2. Mediation models in the prediction of adolescent antisocial behavior

Note: All path weights are unstandardized. Prior antisocial behavior was allowed to correlate with family and neighborhood factors (correlations omitted from figure). * $p < .05$, ** $p < .01$, *** $p < .001$.

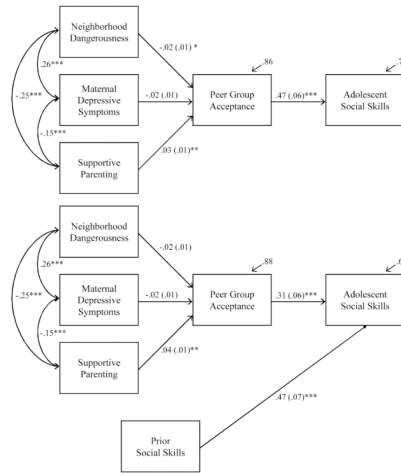


Figure 3. Mediation models in the prediction of adolescent social skills

Note: All path weights are unstandardized. Prior social skills factor was allowed to correlate with family and neighborhood factors (correlations omitted from figure). * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1

Descriptive statistics and bivariate correlations

	N	M	SD	2	3	4	5	6	7	8
Family and Neighborhood Factors (early childhood)										
1. Neighborhood Dangerousness	305	25.86	7.87	.26 ^{***}	-.24 ^{***}	-.27 ^{***}	.29 ^{***}	-.29 ^{***}	.26 ^{***}	-.17 ^{***}
2. Maternal Depressive Symptoms	308	7.90	5.68		-.15 ^{***}	-.21 [*]	.35 ^{***}	-.23 ^{***}	.28 ^{***}	-.13 [*]
3. Supportive Parenting	289	32.93	6.39			.25 ^{***}	-.28 ^{***}	.34 ^{***}	-.27 ^{***}	.28 ^{***}
Peer Relationships (middle childhood)										
4. Peer Group Acceptance	146	.00	.93				-.41 ^{***}	.34 ^{***}	-.41 ^{***}	.47 ^{***}
Prior Child Adjustment (early and middle childhood)										
5. Antisocial Behavior	308	-.01	.77					-.51 ^{***}	.48 ^{***}	-.43 ^{***}
6. Social Skills	295	.01	.83						-.24 ^{***}	.52 ^{***}
Child Adjustment (early adolescence)										
7. Antisocial Behavior	271	-.01	.79							-.53 ^{***}
8. Social Skills	261	-.01	.88							

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

Table 2
Coefficients from test of additive effects model in the prediction of adolescent antisocial behavior and social skills

Predictors	Adolescent Antisocial Behavior				Adolescent Social Skills			
	Without Prior Adjustment in Model		With Prior Adjustment in Model		Without Prior Adjustment in Model		With Prior Adjustment in Model	
	<i>B (SE)</i>	Std. <i>β</i>	<i>B (SE)</i>	Std. <i>β</i>	<i>B (SE)</i>	Std. <i>β</i>	<i>B (SE)</i>	Std. <i>β</i>
Neighborhood Dangerousness	.01 (.01)	.08	.01 (.01)	.05	-.001 (.01)	-.02	.01 (.01)	.04
Maternal Depression	.02 (.01)	.17**	.01 (.01)	.09	-.002 (.01)	-.01	.01 (.01)	.03
Supportive Parenting	-.02 (.01)	-.14*	-.01 (.01)	-.01	.02 (.01)	.17*	.01 (.01)	.10
Peer Group Acceptance	-.29 (.06)	-.34***	-.21 (.07)	-.24**	.41 (.07)	.43***	.32 (.06)	.34***
Prior Child Adjustment			.32 (.07)	.31***			.43 (.06)	.40***
<i>R</i> ²		.25***	.32***	.26***		.40***		.40***

Note: The predictors were allowed to covary in each model tested.

*
p < .05

**
p < .01

p < .001

Table 3
Coefficients from indirect effects in the prediction of adolescent antisocial behavior and social skills

Independent Variable	Mediator	Dependent Variable	Without Prior Adjustment in Model		With Prior Adjustment in Model	
			B (SE)	C.I.	B (SE)	C.I.
Neighborhood Dangerousness	Peer Group Acceptance	Antisocial Behavior	.011 (.004)*	.002 – .019	.006 (.003)	–.001 – .012
Maternal Depression	Peer Group Acceptance	Antisocial Behavior	.008 (.005)	–.002 – .018	.004 (.004)	–.003 – .011
Supportive Parenting	Peer Group Acceptance	Antisocial Behavior	–.012 (.006)*	–.022 – –.002	–.007 (.004)	–.015 – .000
Neighborhood Dangerousness	Peer Group Acceptance	Social Skills	–.010 (.005)*	–.019 – .000	–.006 (.004)	–.013 – .001
Maternal Depression	Peer Group Acceptance	Social Skills	–.008 (.006)	–.019 – .003	–.005 (.004)	–.013 – .003
Supportive Parenting	Peer Group Acceptance	Social Skills	.017 (.006)**	.005 – .029	.011 (.005)*	.002 – .021

Note: C.I. = 95% confidence interval for B.

**
p < .01

*
p < .05