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The Multifaceted Impact of Peer Relations on Aggressive-Disruptive Behavior in Early Elementary School

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Abstract

Following a large, diverse sample of 4096 children in 27 schools, this study evaluated the impact of three aspects of peer relations, measured concurrently, on subsequent child aggressive-disruptive behavior during early elementary school – peer-dislike, reciprocated friends' aggressiveness, and classroom levels of aggressive-disruptive behavior. Teachers rated child aggressive-disruptive behavior in first and third grade, and peer relations were assessed during second grade. Results indicated that heightened classroom aggressive-disruptive behavior levels were related to proximal peer relations, including an increased likelihood of having aggressive friends and lower levels of peer-dislike of aggressive-disruptive children. Controlling for first grade aggressive-disruptive behavior, the three second grade peer experiences each made unique contributions to third grade child aggressive-disruptive behavior. These findings replicate and extend a growing body of research documenting the multifaceted nature of peer influence on aggressive-disruptive behavior in early elementary school. They highlight the importance of the classroom ecology and proximal peer relations in the socialization of aggressive-disruptive behavior.

Keywords

Aggressive-disruptive behavior; aggression; peer relations; peer influences; classroom context

By the 1990s, sociometric and social-mapping research had confirmed the role of two peer influences in the development of aggressive behavior problems (Coie & Dodge, 1998). These peer processes were thought to operate sequentially. First, children who entered elementary school with high rates of aggressive-disruptive behavior were disliked by mainstream peers, decreasing their opportunities for positive peer socialization and increasing their social alienation (Coie, 1990). Second, by the transition into adolescence, disliked aggressive children began to congregate, forming friendships with each other, supporting and mutually reinforcing antisocial attitudes and behaviors (Cairns, Cairns, Neckerman, Gest & Garipey, 1988; Patterson, Dishion, & Yoerger, 2000).

During the past decade, new research suggests that peer influences on aggression are more complex than once thought. Rather than being static across contexts, peer influences are affected by features of the peer ecology at the classroom level, particularly the prevalence of aggressive behaviors (Dishion & Tipford, 2011; Henry et al. 2000). Furthermore, it appears that affiliations with aggressive friends may affect aggression development at a very young

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age – well before the transition into adolescence. That is, recent research suggests that aggressive preschool and early elementary children tend to befriend each other and spend time together, reinforcing each other's rule-breaking behaviors at a point in development much earlier than previously thought (Hanish, Martin, Fabes, Leonard, & Herzog, 2005; Snyder et al. 2005).

This new research indicates that developmental models linking peer experiences with aggressive behavior in early elementary school need to be revisited. In particular, experiences that aggressive children have with peer dislike and the selective affiliations they form with aggressive friends need to be examined concurrently, to better understand the interplay between these peer processes and their unique contributions to the development of aggressive behavior problems in early elementary school. In addition, classroom ecologies and corresponding peer cultures that vary in terms of the prevalence of aggression should be explored, to better understand the nature of the relationship between classroom-level aggression, more proximal peer experiences, and outcomes of aggressive children.

The purpose of the present study was to extend the understanding of peer influence on aggressive-disruptive behavioral development during the early elementary years by examining the concurrent impact of peer disliking, reciprocated friendships with aggressive peers, and second grade classroom aggression levels on changes in child aggression from grade 1 to 3. Of central interest was the impact of classroom aggression on the proximal peer experiences associated with aggressive behavioral development (peer disliking and friends' aggressiveness), and the interplay between classroom aggression, peer disliking, and friends' aggression as potentially intertwined peer influences affecting child aggression over time. Relevant research on these topics is reviewed, followed by the specific hypotheses tested in this study.

Aggression and Peer Rejection

It is well-established that children who behave aggressively in early elementary school tend to be disliked by their peers and ostracized from normative peer interactions (Coie & Dodge, 1998). Although one might expect that peer sanctions would lead to reduced aggression, research suggests that being disliked by mainstream peers has the opposite effect, and predicts future aggressive-disruptive behavior (Bierman & Wargo, 1995; Kupersmidt & Coie, 1990; Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & Conduct Problems Prevention Research Group [CPPRG], 2002). For example, controlling for initial aggression, peer rejection in first grade enhanced the prediction of aggressive conduct problems in fourth grade (Miller-Johnson et al., 2002). Similarly, controlling for initial externalizing problems, peer rejection in third grade enhanced the prediction of externalizing disorder in adolescence (Coie, Lochman, Terry, & Hyman, 1992).

Peer disliking is thought to amplify aggressive-disruptive behavior in two ways: by limiting opportunities for positive peer socialization experiences needed to develop prosocial skills, and by exposing children to coercive treatment by other children (Coie, 1990; Snyder et al., 2008). Peer-accepted and prosocial children tend to play together, leaving those who are aggressive and less-preferred as playmates to interact with each other (Fabes, Hanish & Martin, 2003). Consequently, disliked children more often play alone or with younger children, providing low levels of exposure to the types of social support and social exchanges that foster social competence and the development of anger management and negotiation skills (Dodge, Coie, Pettit, & Price, 1990). In addition, negative reputational biases often develop, contributing to hostile attributions about and victimization of disliked children by their peers (Coie & Kupersmidt, 1983).

Affiliation with Aggressive Friends

Despite being disliked by mainstream peers, many aggressive-disruptive children have reciprocated friendships (Hektner, August, & Realmuto, 2000; Miller-Johnson et al., 2002) and some attain central and influential positions in peer networks (Estell, Cairns, Farmer & Cairns, 2002). By late childhood and early adolescence, aggressive children tend to affiliate selectively with other aggressive children who have similar positive attitudes toward risk-taking and antisocial activities (Cairns et al., 1988; Espelage, Holt & Henkel, 2003; Farmer & Hollowell, 1994). In addition, two recent studies suggest that, as early as the preschool and kindergarten years, aggressive children congregate and play together, forming friendships around their “common ground” interests in risky and rule-breaking behavior (Hanish et al., 2005; Snyder et al., 2008).

Increasing evidence suggests that the friendships of aggressive children create niches of social opportunity in which aggressive behavior and rule-breaking talk are modeled and positively reinforced with laughter, interest, and approval. Sometimes termed deviancy training or peer contagion, these experiences amplify aggression over time (Dishion & Tipsord, 2011; LaCourse, Nagin, Tremblay, Vitaro & Claes, 2003). Most of the research on deviancy training has focused on adolescents; however, two recent studies documented peer reinforcement of rule-breaking behaviors among young children as well (Hanish et al., 2005; Snyder et al., 2008). Whereas deviant adolescent friends tend to share stories of planned or completed delinquent activities and substance use, younger aggressive friends are more likely to laugh at each other's bathroom talk, swear words, and rule violations, although peer support for sexual gestures and interpersonal aggression has also been observed among aggressive kindergartners (Snyder et al., 2005). The social influence process may be quite parallel across these developmental periods, as in both cases, aggressive friends model rebellious attitudes and reinforce risky and rule-breaking behaviors.

In addition to these proximal peer influences, recent research suggests that characteristics of the social ecology of the classroom, particularly classroom-level aggression, warrants further study, as it appears to influence the acceptability of aggressive behavior, thereby potentially affecting the peer interactions that shape aggressive behavior (Dishion & Tipsord, 2011).

Influence of Classroom Context on Aggressive-Disruptive Behavior

When students are placed in elementary classrooms that are characterized by high rates of student aggression, their aggressive behavior tends to increase, showing elevations that are sustained over time (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Stearns, Dodge, Nicholson, & CPPRG, 2008; Thomas, Bierman & CPPRG, 2006). Kellam and colleagues (1998) found that aggressive boys placed in first-grade classrooms characterized by high levels of student aggression (based on mean teacher ratings) were significantly more likely to be rated as aggressive in sixth grade than aggressive boys placed in less aggressive first-grade classrooms. Similarly, other studies have documented an impact of classroom-level aggression on growth in student aggression in fourth and fifth grades (Barth et al., 2004), and second grade (Warren, Schoppelrey, Moberg & McDonald, 2005). In addition, using the same data set as this study, Thomas et al. (2006) documented cumulative effects for exposure to aggressive classrooms from first through third grade, with the number of years of exposure linked linearly to gains in aggression.

Multifaceted Peer Influences

Given that peer disliking, affiliation with aggressive friends, and placement in classrooms characterized by high levels of student aggression have all been implicated in the amplification of aggressive-disruptive behavior during the early elementary years, a key question is the degree to which there is interplay among these facets of peer experience, and the nature of that interplay. Behavioral observations conducted by Snyder et al. (2008) suggest that aggressive kindergarten children are exposed both to elevated rates of rejecting behavior from peers, and elevated rates of positive responding to rule-breaking behaviors, suggesting that peer disliking and deviancy training by aggressive friends may occur concurrently. However, only a few longitudinal studies have examined the concurrent impact of peer disliking and affiliation with aggressive friends on subsequent behavior, and they report mixed findings. Laird et al. (2001) found that peer rejection in middle childhood (ages 6–9) uniquely predicted increases in externalizing behaviors (at age 13), whereas youth affiliation with antisocial peers did not. In contrast, studying children in middle childhood, both Kupersmidt et al. (1995) and Werner and Crick (2004) found that peer rejection and the aggressiveness of one's friends made independent contributions to growth in aggressive behavior in subsequent years.

Conceptually, peer disliking and friendships with aggressive peers are inter-related processes. It is commonly thought that being disliked by the normative peer group leads aggressive children to select aggressive friends by default, because other friendships are not available to them (Coie, 1990). In support of this hypothesis, both Hektner et al. (2000) and Snyder (1997) found that aggressive children were just as likely as their non-aggressive classmates to nominate non-aggressive peers as friends, but these choices were often non-reciprocated, leaving them with reciprocated friendships that involved aggressive peers. On the other hand, Snyder (1997) also found that aggressive children received more positive peer responding when interacting with aggressive than with non-aggressive peers, suggesting that they may be drawn to aggressive friends on the basis of reinforcement contingencies.

To some extent, the degree to which aggressive children are shut out of friendships with non-aggressive peers or are attracted to friendships with aggressive peers may depend upon the social ecology of the classroom. That is, it has been documented that the prevalence of aggressive behavior in a social group or classroom affects the social acceptability of aggressive behavior (Boivin, Dodge, & Coie, 1995; Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). At higher levels of classroom aggression, correlations between peer disliking and aggressive behavior are attenuated, such that aggressive children are more accepted by classroom peers (Barth et al., 2004; Stormshak et al., 1999). Aggressive classroom environments may also influence the likelihood that children will have aggressive friends, simply as a function of the greater density of aggressive children in the nomination pool, or possibly because of the greater social acceptability of aggressive behavior in those classrooms.

Still unknown is whether aggressive classroom environments promote child aggression directly or whether the aggressive contexts influence child behavior indirectly, by way of their associations with the proximal peer influences of peer disliking and friendship formation. Additionally, the direct effect of classroom context may not affect all children equally. Dishion and colleagues (2008) proposed a social augmentation hypothesis that suggests that socially rejected children may be more influenced by the presence of aggressive peers than other children. Supporting this hypothesis, Snyder and colleagues (2010) found that the deviancy training processes were more powerful for children who were socially rejected than for children who were well liked by peers.

The Present Study

The present study was designed to extend the understanding of peer influence on the aggressive-disruptive behavioral development of young children in the early elementary grades by examining the concurrent impact of peer disliking, reciprocated friendships with aggressive peers, and classroom-level aggression. For three successive cohorts in 27 schools, teachers rated child aggressive-disruptive behavior in first and third grades, and peer relations were measured in second grade -- including peer nominations to assess peer disliking and to identify the aggression level of reciprocated friendships, and averaged teacher ratings to create an index of the mean level of classroom aggressive disruptive behavior.

The hypotheses are illustrated in Figure 1. At the level of proximal peer influence, it was hypothesized that elevated aggressive-disruptive behavior in first grade would predict two features of peer experience in second grade that would, in turn, predict increased aggressive-disruptive behavior in third grade. First, we predicted that early aggression would increase peer disliking, promoting future aggression (pathway B1-B2). Second, we predicted that early aggression would increase the likelihood of reciprocated friendships with aggressive peers, promoting future aggression (pathway A1-A2). At the level of classroom context influence, we hypothesized that classroom-level aggression would have both indirect and direct effects. Indirectly, it would increase future aggression by its association with the proximal peer experiences influencing child aggression: 1) it would moderate the association between child aggression and peer disliking, such that aggressive first-graders would be less disliked by peers in second grade when they were in classrooms characterized by higher levels of student aggression (pathway C1), and 2) it would increase the number of friendships children formed with aggressive peers in second grade (pathway C2). In addition, we hypothesized that classroom-level aggression would also have a direct effect, increasing student aggression in third grade (controlling for first-grade aggression) (C3). In these models, we also explored the hypothesis that being disliked by peers increases a child's vulnerability to negative peer influence (C4). To determine whether children who were more disliked by peers were more likely to have aggressive friends, we examined the concurrent relation between second grade peer dislike and aggressive friends. To determine whether children who were more disliked by peers were more vulnerable to the influence of classroom-level aggression, we assessed the link between peer dislike and pathway C3 (e.g., the impact of classroom-level aggression on child aggressive outcomes).

Method

Participants

Participants included 4,096 children (50.6% male), who were attending 27 schools assigned to the no-treatment control group of the Fast Track program, a large longitudinal investigation of the development and prevention of conduct disorders (CPPRG, 1992). All children with permission to participate in the classroom data collection were included (e.g., the "universal" sample). The schools were located in four demographically diverse locations (Durham, North Carolina; Nashville, Tennessee; Seattle, Washington; and rural central Pennsylvania). Overall, the ethnic composition of the universal sample was 35.9% African American, 56.2% European American, and 8% other ethnicities (e.g., Hispanic, Native American, Asian American). In second-grade, children were in 210 classrooms in 27 schools. Schools were selected as high risk based on the crime and poverty statistics of the neighborhoods they served. Student poverty (indexed by the percent of students who qualified for free/reduced lunch) ranged from 20% to 97%, with a mean of 51%, and school-level ethnic composition ranged from 0% European American to 99% European American,

with a mean of 40%. 10 schools were located in rural PA, with the others all in urban locations.

Procedures—Data were collected for three consecutive cohorts. All children were recruited initially when they were in kindergarten, and then followed longitudinally, with teacher ratings collected in the Spring of each child's first, second and third grade. Research assistants interviewed teachers each year, and administered the Teacher Observation of Classroom Adaptation-Revised (TOCA-R; Werthamer-Larsson, Kellam, & Wheeler, 1991), collecting teacher ratings on all of the students in the class. Teachers were reimbursed for their time. In the spring of second grade, children with parental informed consent participated in individual sociometric interviews at school. Students were read a list of their classmates' names to ensure that they were familiar with each of their classmates, and then completed ratings and provided nominations.

Measures

Child aggressive-disruptive behavior: Teacher ratings were used to assess child aggressive-disruptive behavior at the end of first and third grades, using the Authority Acceptance Scale of the TOCA-R (Werthamer-Larsson et al., 1991). The 10 items on this scale describe a range of aggressive and oppositional behaviors (e.g., fights, breaks rules, takes others' property, harms others.) Items are rated on a 6-point Likert scale, from 1 (*almost never*) to 6 (*almost always*) ($\alpha=.95$) (Werthamer-Larsson et al., 1991). The natural logarithm of the average item score was used to correct for a positively skewed distribution.

Peer dislike: During the individual interviews, children were asked to nominate the classmates they “liked most” and “liked least”. Unlimited nominations were accepted and students could nominate peers of either gender. Only students with parental permission were interviewed, but they were allowed to nominate any classmate.

Peer dislike was assessed by subtracting the total number of “liked least” nominations from the total number of “liked most” nominations received by a child, and dividing by the number of raters (e.g., the number of children participating in the sociometric nominations in that classroom). This method is similar to and correlates highly ($r = .95$) with the typical “social preference” construct created by standardizing social preference scores within classrooms (Coie, Dodge, & Coppotelli, 1982). This modified method retains between-class differences in sociometric status that are attenuated by within-class standardization.

Aggression levels of reciprocated friends: During the individual sociometric interviews, children were asked to rate how much they liked to play with each classmate, by pointing to a face on 3-point scale (“like a lot” smiley face, “just okay” neutral face, or a “don't like” frown face). All children in the classroom were listed on this roster, but only children with parental permission participated in the interviews and provided ratings. If two children indicated that they liked to play with each other “a lot”, they were considered to have a reciprocated friendship. To examine the robustness of the findings, the mean aggression of the peers that a child nominated, regardless of whether the other child reciprocated the nomination, were also examined. All multi-level models were computed for both reciprocated and nominated-only “friends,” and across all models, no coefficient was different by more than .03, making the significance and interpretation of findings equivalent. Here, we report on the analyses using reciprocated nominations, which had slightly stronger associations than nominated-only “friends.” Using the play ratings allowed us to use unique measures to assess peer dislike vs. friendships, and also identified a larger number of reciprocated friendships than nominated in the open-ended procedure (see also Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999).

In the present study, there were 1192 (30%) children with missing friendship data who were excluded from analyses, primarily ($N = 1092, 27\%$) due to moves away from the core schools where sociometrics were collected. 100 children with missing data participated in the sociometric interviews and rated friends, but did not have any reciprocated friendships (3% of those interviewed). Children with missing friendship data did not differ from those with data in terms of peer-nominated aggression, and the rate of participation in sociometric interviews at the classroom level was uncorrelated with classroom rates of reciprocated friend aggressiveness, $r = -.10, p > .10$ (class-level participation rate: $M = 73.6\%$, range = 32%-100%). Together, these results suggest that these sociometric data were missing at random with regard to the aggressive nominations, with aggression represented equally among the children who did and did not have reciprocated friendship data. To further test for sensitivity to missing data (for aggressive friends and missingness on all other variables), SAS Proc MI was used to impute data ignoring classroom and school-level clustering (accounting for the clustering by including classrooms as a dummy variable was not feasible due to the number of classrooms/schools). The results from the multiply imputed data were substantively identical to original analyses providing further confidence that missing data (on friend's aggression or other variables) were unlikely to affect the results in a systematic way.

Peer nominations of aggression were used to assess the aggressiveness of each child's friends. During the sociometric interviews, children were asked to nominate classmates who fit this description: "Some kids start fights, say mean things, and hit other kids." Unlimited nominations were accepted. In order to correct for variations in participation rate (and corresponding variations in the likelihood that a child would be nominated as aggressive) without removing mean differences between classrooms, the number of nominations received by a child was divided by the number of children who participated in the interviews, creating a score representing the percentage of classmates who nominated a given child as "aggressive". Because only a few children in each class tend to attract the majority of aggressive nominations, the distribution was highly skewed. In order to normalize the distribution and avoid results that were driven by a few outliers, aggressive nominations were rescaled in the following fashion: 0 = no aggressive nominations, 1 = nominated by less than a tenth of participating classmates, 2 = nominations by between one-tenth and one-third of participating classmates, and 3 = nominated by more than a third of participating classmates. Most children (92%) had more than one reciprocated friendship; the mean number of reciprocated friends was 4.7. To derive a single index representing the aggressiveness of a child's friends, we averaged the re-scaled peer-nominated aggression score of all a child's reciprocated friends and used the mean level in analyses.

Classroom aggression: The average aggression level in each classroom was assessed using the mean teacher-reported TOCA-R Authority Acceptance score in each second-grade classroom. Because this classroom-level aggression is the same for each child in a given classroom, this variable was entered as a level 2 variable in the multi-level models. Importantly, first- and third-grade teacher ratings were used to assess child aggression, whereas second-grade teacher ratings were used to assess classroom-level aggression. This procedure provided independent sources of information, avoiding spurious associations due to same-rater biases.

Results

Preliminary Analyses

Descriptive analyses (means, standard deviations, ranges) for all variables are presented separately by gender in Table 1. Correlations were calculated to characterize the relations

among the child's first grade (baseline) and third grade (outcome) aggression, and second grade peer influences (peer dislike, friend aggression, and classroom-level aggression). In these simple correlations, elevated aggression in first grade predicted peer dislike, $r = .37$, and friendships with aggressive peers in second grade, $r = .22$, $p < .01$. Similarly, peer dislike and aggressive friendships in second grade predicted child aggression in third grade, $r = .38$ and $r = .24$, respectively, $p < .01$. Interestingly, child aggression in first grade was also associated with classroom aggression in second grade, $r = .24$, $p < .01$ indicating that children were not randomly distributed among classrooms, but rather that children with similar levels of aggression tended to be clustered together. Also of note is that the concurrent correlations among the three sources of peer influence in second grade (e.g., peer dislike, friends' aggression, and classroom aggression) were small (all less than $r = .15$), indicating that these potential influences on aggression are relatively independent of one another (see Table 2).

Multi-level Models Predicting Second Grade Peer Relations

Multi-level models (MLM) with three levels were used in all of the following analyses to account for non-independence in the dependent measures that resulted from children being grouped within classrooms, and classrooms being grouped within schools. To estimate the size of the effects, the predictors and dependent variables in all models were standardized ($M = 0$, $SD = 1$), such that the beta coefficients in the tables are interpretable as the amount, in standard deviations, that the dependent variable changed as the independent variable increased by 1 standard deviation. For all MLMs, sex was dummy coded (Male = 0, Female = 1), and school was included as a level 3 grouping variable. Unless otherwise noted, models were not significantly different by gender, as tested by log likelihood ratio tests (all $p > .05$). Equations for all MLM models are included in Appendix A.

It was hypothesized that first-grade aggressive behavior would predict greater peer dislike in second grade, but that this predictive relationship would be attenuated in second grade classrooms characterized by high levels of student aggression. The model testing these hypotheses included child sex and first grade aggression as level 1 variables, classroom aggression in second grade as a level 2 variable, and second grade peer dislike as the dependent variable. As shown in the first column of Table 3, first grade aggression was associated with increased peer dislike in second grade, $\beta = .43$, $p < .01$, and boys were less liked than girls, $\beta = -.28$, $p < .01$. In addition, a significant interaction emerged between classroom aggression and first grade child aggression, $\beta = -.06$, $p < .01$, documenting that the impact of child aggression on peer dislike was significantly attenuated in more aggressive classrooms. This interaction is illustrated in figure 2, with separate lines for levels of classroom aggression at +1 SD and -1 SD.

Based on the homophily model, it was hypothesized that aggressive first-graders would seek out aggressive friends when they transitioned into second grade, and that higher levels of classroom aggression would increase the likelihood of having aggressive friends. These hypotheses were tested with a multi-level model, in which child sex and first grade aggression served as level 1 variables, and second grade classroom aggression served as a level 2 variable, and friend aggression served as the dependent variable. As shown in the second column of Table 3, second-grade children were more likely to have aggressive friends if they were aggressive in first grade, $\beta = .10$, $p < .01$, if they were boys, $\beta = -.85$, $p < .01$, and if they were placed in second grade classrooms characterized by higher levels of student aggression, $\beta = .07$, $p < .05$.

A final analysis examining second grade peer relations explored the "homophily by exclusion" hypothesis that being disliked by one's peers constrains friendship choices, and is thereby associated with friendships with aggressive classmates. In this MLM, child sex, first

grade aggression, and second grade peer dislike were included as level 1 variables, classroom aggression was the level 2 variable, and the aggressiveness of second grade friends was the dependent variable. As shown in the third column of Table 3, the “homophily by exclusion” hypothesis was not supported, as no significant relation emerged between second grade peer dislike and second grade aggressive friendships, $\beta = .05, p > .10$. With peer dislike in the model, the other predictors of second grade aggressive friendships remained significant, including first grade child aggression, $\beta = .08, p < .01$, sex, $\beta = -.82, p < .01$, and second grade classroom aggression, $\beta = .08, p < .01$. Log likelihood ratio tests indicated that this model was significantly different by gender ($D = 9.4, df = 3, p < .05$). When run separately by gender, both child aggression and classroom aggression predicted aggressive friends more strongly for girls than for boys; peer dislike did not predict having more aggressive friends for either.

Examining Second Grade Peer Influence on Third Grade Aggressive Behavior

Next, the degree to which second grade peer experiences (peer dislike, aggressive friends, and aggressive classroom context) predicted changes in child aggression between first and third grade was examined. This model also tested the degree to which peer dislike moderated the direct effect of aggressive classroom contexts on changes in child aggression over time. In this model, child sex, first grade aggression, second grade friend aggression, second grade peer dislike were included as level 1 variables, and second grade classroom aggression was included as a level 2 variable. Because children were nested in second and again in third grade, ICC's were examined to determine the most appropriate level-two grouping unit: second-grade only, third-grade only, or a combination of second and third grade. The ICCs for the combination of 2nd and 3rd grade were the largest, so a combination of a child's second and third grade classroom was used as the grouping variable to account for non-independence due to classroom level influences across both grades. The mean number of children in each second-grade-third-grade classroom unit was 4.9 ($SD = 4.1$).

As displayed in Table 4, unique contributions to the prediction of third grade child aggression were made by first grade child aggression, $\beta = .52, p < .01$, sex, $\beta = -.10, p < .05$, second grade aggressive friends, $\beta = .09, p < .01$, second grade peer dislike, $\beta = .17, p < .01$. Additionally, second grade classroom aggression had a main effect, $\beta = .06, p < .05$, that was moderated by second grade peer dislike, $\beta = .04, p < .05$, such that being more disliked increased the influence of aggressive classroom contexts on a child's future aggression. The interaction is illustrated in figure 3, with separate lines for levels of peer dislike at +1 SD and -1 SD. Having aggressive friends, being more disliked, and being in a classroom characterized by high levels of student aggression all emerged as influences contributing to child aggressive behavior measured a year later, controlling for initial levels of child aggression and gender. The results of the multilevel models are summarized in figure 4.

Discussion

The findings from this study confirm the importance of multiple, co-occurring peer processes (peer dislike and having aggressive friends) in the socialization of child aggressive-disruptive behavior during the early elementary years. While the influence of peer dislike and having aggressive friends have each been linked with later aggression independently, this is the first study to examine the processes at the same time. In addition, the findings demonstrate the importance of the classroom ecology; classrooms characterized by high levels of student aggression promoted the development of child aggression directly and were particularly influential for students who were more disliked by peers. Additionally, classroom contexts had an indirect effect, influencing the proximal peer processes that then influenced aggressive behavior. Each of these peer influences exerted unique, though small

effects on child aggression. However, the small effects represented a sustained impact, evident a year after exposure. Prior research suggests that these influences have cumulative effects over time and thus represent important targets for prevention and early intervention efforts to reduce aggression (DeRosier, Kupersmidt, & Patterson, 1994; Thomas et al., 2006).

Proximal Peer Influences on Aggressive-Disruptive Behavior

Consistent with prior research, first grade aggressive-disruptive behavior predicted peer dislike in second grade (Coie, 1990). Developmentally, peer dislike in second grade predicted elevated aggressive-disruptive behavior in third grade, controlling for initial levels of aggressive-disruptive behavior in first grade, demonstrating a link between peer dislike and increased aggression over time (Kupersmidt et al., 1995; Miller-Johnson et al., 2002).

Also consistent with prior research and the homophily model, children made friends with second-graders who were similar to themselves in terms of aggressiveness (Hanish et al., 2005; Snyder et al., 2005). Aggressive-disruptive first-graders developed reciprocated friendships with aggressive classmates in second grade, and having more aggressive friends in second grade predicted elevated aggressive-disruptive behavior in third grade, controlling for first-grade aggressive-disruptive behavior.

Surprisingly, however, peer dislike was not associated with increases in the aggressiveness of one's friends during second grade; instead, these two developmental pathways appeared to operate concurrently and independently. Developmental studies have shown that peer dislike during elementary school predicts the likelihood of deviant peer affiliations in early adolescence, suggesting prospective links between exclusion by mainstream peers and subsequent friendships with aggressive peers (Kupersmidt et al., 1995; Laird et al., 2001). In addition, prior research suggests that aggressive children often attempt unsuccessfully to form friendships with non-aggressive classmates, suggesting that, to some extent, their reciprocated friendships with aggressive classmates occur by default (Hektner et al., 2000; Snyder, 1997). However, with multiple sources of peer influence modeled simultaneously in the present study, the results support homophily models, which postulate that aggressive, rule-breaking children are attracted to other aggressive, rule-breaking children and seek them out as friends in a process independent from their acceptance or rejection by mainstream peers (Cairns et al., 1988).

This study is the first to document the independent associations of peer dislike and aggressive friends on child aggressive-disruptive behavior at this early age, and the findings are consistent with prior studies of microsocial peer processes affecting young aggressive children. Specifically, Snyder et al. (2008) found that, during play interactions with randomly-selected classmates, aggressive-disruptive kindergarten children were more likely than their non-aggressive peers to receive negative peer treatment (exclusion, teasing, scapegoating), but also likely to elicit positive responding for their rule-breaking talk and disrespectful or aggressive behaviors. Similar to the present study findings, these two processes were independent and uncorrelated (Snyder et al., 2008).

Peer dislike may increase aggressive-disruptive behavior by isolating children from the positive peer experiences that support prosocial development and foster peaceful negotiation skills, and by exposing children to higher levels of peer rebuff and ill-treatment, which fuel anger and elicit aggressive retaliation (Coie, 1990; Coie & Dodge, 1998). In addition, in the context of social challenges, aggressive behaviors may allow these children to gain dominance in social conflicts (positive reinforcement) or terminate undesired peer treatment (negative reinforcement), thereby serving as a strategy that has short-term functionality (Dishion & Tipsord, 2011; Snyder et al., 2005). Independent from those processes, and

perhaps associated with sensation-seeking proclivities, interactions with aggressive peers are attractive and exciting, and provide an additional source of positive reinforcement for antisocial behavior (Hanish et al., 2005; Snyder et al., 2008).

In terms of the effect sizes, the association between having aggressive friends and growth in aggression at this age was relatively small ($\beta = .09$), as were the impacts of peer dislike ($\beta = .17$), and classroom levels of aggression ($\beta = .06$), but considering that these are sustained effects, measured a year after the second grade exposure to aggressive friendships, even small effects are notable. That is, these sustained effects suggest that children are not simply reacting to their present environment, but rather, appear to be learning lasting rules of behavior that persist through time and across environments.

In the Snyder et al. (2008) study, certain concurrent child characteristics (elevated inattention-impulsivity and anxiety display) increased the likelihood of experiencing negative treatment by peers, whereas other child characteristics (verbal ability) increased the likelihood of experiencing positive peer responding to aggressive acts. In this study, characteristics of the classroom ecology also affected the likelihood of experiencing greater peer dislike and having aggressive friends.

Aggressive Classroom Context

Children who were placed in second grade classrooms characterized by higher overall levels of student aggression were more likely to form reciprocated friendships with aggressive peers than were children placed in less aggressive classrooms. In addition, consistent with prior research, classroom aggression moderated the impact of child aggression on peer dislike, such that aggressive children were less disliked in aggressive classrooms (Barth et al., 2004; Stormshak et al., 1999). However, the fact that aggressive children were more accepted in high-aggression classrooms did not “protect” them from undesirable peer socialization; it simply shifted the relative degree to which having aggressive friends vs. peer disliking characterized the peer influence fostering their aggression.

In addition to the indirect effects on proximal peer influences, classroom aggression levels had an additional, unique, direct effect on later aggression after controlling for initial levels of aggression, friends' aggression, and peer dislike. Several factors may account for this direct effect. First, in a classroom that contains many aggressive peers, children may be exposed to higher levels of modeling of aggressive and oppositional responding, and may also receive more reinforcement from peers for the display of aggressive or oppositional behavior, beyond the influence of reciprocated friends. For example, Snyder and colleagues (2008) found that deviancy training among kindergarten children occurred with randomly paired classmates, and was not limited to friends. Second, the prevalence of aggressive youth in any social group (including classrooms) affects social norms, making aggression more acceptable. Henry et al. (2000) showed that classmate's beliefs about the acceptability of aggression influenced both an individual's own normative beliefs about aggression and increased their aggressive behavior. Third, higher levels of student aggression may indicate a classroom that is difficult for a teacher to manage, which may increase the degree to which the teacher relies on reactive and punitive management strategies, fueling aggression through coercive processes (Patterson, Reid & Dishion, 1992). Indeed, empirical studies have linked punitive, reactive classroom management strategies to increased, rather than decreased discipline problems (Hamre & Pianta, 2001; Thomas, Bierman, Powers & CPPRG, 2011).

The results of this study also indicate that aggressive classroom ecologies are not equally influential for all children, but rather have a larger impact on children who are disliked. These results are consistent with the hypothesis that children who are socially rejected are

more susceptible to deviant peer influence than are peer-accepted children Dishion & Tipsord, 2011; Snyder et al., 2010). Socially marginalized children are more likely to receive reinforcement for their aggressive behavior than for their positive social behaviors, given the relative low frequency and skill of their prosocial overtures. According to the social augmentation hypothesis, the differential rates of reinforcement are likely to be particularly divergent in high aggression classrooms, thereby amplifying deviancy training processes in those contexts (Dishion, Piehler, & Myers, 2008).

The sustained impact of an aggressive classroom on the behavior of a child of average peer dislike a year later is small ($\beta = .06$). However, the most aggressive classrooms are typically found in poor urban environments, and for children in these environments, the experience of being in an aggressive classroom is frequently a chronic rather than an occasional phenomenon, with cumulative effects on child aggression (Thomas, et al. 2006). Therefore, while the size of the direct effect of classroom aggression is small, because it affects all children in a given classroom and it frequently has compounding effects across multiple years, the total effect on the population may be larger than the small effect size would typically indicate.

Examination of Sex Differences

This study included boys and girls, and found main effects indicating that boys in this study had higher levels of aggression, more aggressive friends, and higher levels of peer dislike than did girls. Differences in the relative strength of relationships between a child's own aggression (initial or final), proximal peer influences, classroom aggression were examined and, with the exception of the “homophily by exclusion” model (table 3, 3rd column), no differences were found. When the “homophily by exclusion” model was run separately by gender, both child aggression and classroom aggression predicted aggressive friends more strongly for girls than for boys, but peer dislike did not predict having more aggressive friends for either. Caution should be used in interpreting this one significant difference, since multiple tests increase the chance of making a Type II error. Overall, the pattern of findings suggest the relationships between context, peer experiences and children's aggression development are similar across genders. The higher base-rate of aggressive-disruptive behavior that is evident for boys at school entry appears maintained over time in part due to peer influence – e.g., the higher base-rate of peer disliking and aggressive friends among boys that accompanies and enhances future aggression.

It should be noted that we did not have measures of relational aggression, which might have allowed us to more fully explore gender differences in the expression and development of aggression. Prior research suggests that physical aggression elicits peer dislike for both boys and girls, and is amplified by interactions with physically aggressive peers, consistent with the findings of this study (Werner & Crick, 2004). In addition, interaction with relationally aggressive peers may amplify relational aggression, which is exhibited at comparable rates by girls and boys in the early elementary years (Werner & Crick, 2004). The measure of aggressive-disruptive behavior used in this study emphasized overt aggressive acts (hitting others, damaging others' property, fighting with others). Social influence processes may operate somewhat differently (and specifically) in areas of covert antisocial behavior or indirect aggression. This possibility was not testable in this study, and remains a question for future research.

Limitations and Future Directions

Given that this is a non-experimental study, the data are correlational in nature, and hence, caution is warranted in making any casual inferences. While the temporal ordering of the

independent and dependent variables suggests a direction of effect, it is possible that unmeasured variables may account for some of the observed correlations.

Although this study did not evaluate intervention impact, the findings have implications for interventions that aim to reduce aggressive behavior in early childhood. Some interventions designed to reduce aggression utilize social skill training to promote prosocial skills, self-control, and peaceful conflict management skills (Coie & Dodge, 1998). Although skill training interventions have been effective in improving the social preference and social integration of aggressive children (Coie & Dodge, 1998), they may not reduce aggression if children befriend other aggressive peers. It may be important for social skill training interventions to include efforts to foster friendships with non-aggressive peers, in order to reduce the deviancy training that occurs when aggressive children congregate. Intervention approaches that focus on changing peer group norms, such as the Good Behavior Game (Ialongo, Poduska, Werthamer & Kellam, 2001; van Lier, Muthen, van der Sar & Crijen, 2004), may also be important complements to skill training programs, in order to reduce peer reinforcement of aggressive behaviors. Universal social-emotional learning programs that focus on promoting emotion regulation and peaceful social problem-solving skills among all students in the classroom may also reduce aggression at the classroom level (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Intriguingly, it may also be possible for interventions to utilize peer influence to enhance, rather than inhibit, intervention effectiveness. The Multisite Violence Prevention Project (2009) showed that by targeting peers whom teachers identified as socially influential for a social cognitive training intervention, they were able to influence the larger classroom and school ecologies and decreases in aggression were observed in non-targeted peers as well.

The present study also indicates that efforts should be made to avoid the aggregation of aggressive children in classrooms or other groups, in order to reduce the impact on peer norms and peer support for aggressive behavior (Dishion & Dodge, 2005). Prior studies suggest that, even when teachers manage classrooms effectively, classrooms that contain many aggressive children tend to increase child aggression (Thomas et al., 2011). Similarly, in this study, aggressive classrooms influenced the amplification of aggressive child behavior, above and beyond their indirect effects on proximal peer relations. This may be particularly important because while peer influences on aggression were related to a child's initial levels of aggression, and thus are of concern primarily for children who entered school with elevated aggression, classroom context affects all of the children in a classroom, regardless of their initial levels of aggression. As such, intervention approaches may be most effective when they are multifaceted and include policy-related efforts to disperse aggressive students across classrooms and groups, improve teacher management skills, utilize monitoring systems and reward structures that reduce peer support for undesirable behaviors, and provide social skill training to enhance prosocial interaction and conflict management skill development.

Summary

From a developmental perspective, the early elementary school years are pivotal for the effective socialization of aggressive behavior and the amelioration of the negative cascade associated with early-starting aggressive conduct problems (Coie, 1990; Coie & Dodge, 1998). This study extends a growing body of work that indicates that peer dislike and aggressive friends exert concurrent and independent peer influences on aggressive behavior in early elementary school. In addition, it documents the direct and indirect effects of the classroom ecology, indicating the importance of classroom aggression levels in the peer socialization of aggression. Recognizing the multifaceted nature of peer influence in early elementary school may support the design of more effective preventive and early interventions.

Appendix

Appendix A:

Equations for Multi-level Models

Modeling peer dislike in 2nd grade, with 1st grade aggression and gender as Level 1 predictors and classroom aggression in 2nd grade as a level 2 predictor. β_{2jk} is the interaction between 1st grade aggression and 2nd grade classroom aggression:

Level 1:

$$[2^{\text{nd}} \text{ grade Peer dislike}]_{ijk} = \pi_{0jk} + \pi_{1jk} [\text{female}] + \pi_{2jk} [1^{\text{st}} \text{ grade Aggression}] + \epsilon_{ijk}$$

Level 2:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k} [2^{\text{nd}} \text{ grade classroom aggression}] + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k} + \beta_{21k} [2^{\text{nd}} \text{ grade classroom aggression}] + r_{2jk}$$

Level 3:

$$\beta_{00k} = \gamma_{000} + \mu_{00k}$$

$$\beta_{01k} = \gamma_{010}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

$$\beta_{21k} = \gamma_{210}$$

Modeling friends' aggression in 2nd grade, with 1st grade aggression and gender as Level 1 predictors and classroom aggression in 2nd grade as a level 2 predictor (test of the “homophily model”):

Level 1:

$$[2^{\text{nd}} \text{ grade Friends' Aggression}]_{ijk} = \pi_{0jk} + \pi_{1jk} [\text{female}] + \pi_{2jk} [1^{\text{st}} \text{ grade Aggression}] + \epsilon_{ijk}$$

Level 2:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k} [2^{\text{nd}} \text{ grade classroom aggression}] + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k} + r_{2jk}$$

Level 3:

$$\beta_{00k} = \gamma_{000} + \mu_{00k}$$

$$\beta_{01k} = \gamma_{010}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

Modeling friends' aggression in 2nd grade, with 1st grade aggression, 2nd grade peer dislike, and gender as Level 1 predictors and classroom aggression in 2nd grade as a level 2 predictor (test of the “homophily-by-exclusion model”):

Level 1:

$$[2^{\text{nd}} \text{ grade Friends' Aggression}]_{ijk} = \pi_{0jk} + \pi_{1jk} [\text{female}] + \pi_{2jk} [1^{\text{st}} \text{ grade Aggression}] + \pi_{3jk} [2^{\text{nd}} \text{ Grade Peer dislike}] + \epsilon_{ijk}$$

Level 2:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k} [2^{\text{nd}} \text{ grade classroom aggression}] + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k}$$

$$\pi_{3jk} = \beta_{30k} + r_{3jk}$$

Level 3:

$$\beta_{00k} = \gamma_{000} + \mu_{00k}$$

$$\beta_{01k} = \gamma_{010}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

$$\beta_{30k} = \gamma_{300}$$

Modeling 3rd grade aggression, with child sex, 1st grade aggression, 2nd grade friend aggression, 2nd grade peer dislike included as level 1 predictors, and 2nd grade classroom aggression included as a level 2 predictor. β_{31k} is the interaction between classroom levels of aggression and peer dislike. A combination of a child's second and third grade classroom was used as the level 2 grouping variable.

Level 1:

$$[3^{\text{rd}} \text{ grade Aggression}]_{ijk} = \pi_{0jk} + \pi_{1jk} [\text{female}] + \pi_{2jk} [1^{\text{st}} \text{ grade Aggression}] + \pi_{3jk} [2^{\text{nd}} \text{ Grade Peer dislike}] + \pi_{4jk} [2^{\text{nd}} \text{ Grade Friends' Aggression}] + \epsilon_{ijk}$$

Level 2:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k} [2^{\text{nd}} \text{ grade classroom aggression}] + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k}$$

$$\pi_{3jk} = \beta_{30k} + \beta_{31k} [2^{\text{nd}} \text{ grade classroom aggression}]$$

$$\pi_{4jk} = \beta_{40k} + r_{4jk}$$

Level 3:

$$\beta_{00k} = \gamma_{000} + \mu_{00k}$$

$$\beta_{01k} = \gamma_{010}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

$$\beta_{30k} = \gamma_{300}$$

$$\beta_{31k} = \gamma_{310}$$

$$\beta_{40k} = \gamma_{400}$$

References

- Barth JM, Dunlap ST, Dane H, Lochman JE, Wells KC. Classroom environment influences on aggression, peer relations, and academic focus. *Journal of School Psychology*. 2004; 42:115–133.10.1016/j.jsp.2003.11.004
- Bierman KL, Wargo JB. Predicting the longitudinal course associated with aggressive-rejected, aggressive (nonrejected), and rejected (nonaggressive) status. *Development and Psychopathology*. 1995; 7:669–682.10.1017/S095457940006775
- Boivin M, Dodge KA, Coie JD. Individual-group behavioral similarity and peer status in experimental play groups of boys: The social misfit revisited. *Journal of Personality and Social Psychology*. 1995; 69:269–279.10.1037/0022-3514.69.2.269 [PubMed: 7643305]
- Cairns R, Cairns BD, Neckerman HJ, Gest SD. Garipey. Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology*. 1988; 24:815–823.10.1037/0012-1649.24.6.815
- Coie, JD. Toward a theory of peer rejection. In: Asher, SR.; Coie, JD., editors. *Peer rejection in childhood*. Cambridge, MA: Cambridge University Press; 1990. p. 365-402.
- Coie, JK.; Dodge, KA. Aggression and antisocial behavior. In: Damon, W.; Eisenberg, N., editors. *Handbook of Child Psychology, 5thEd, vol 3, Social, emotional, and personality development*. NY: John Wiley & Sons; 1998.
- Coie JD, Dodge KA, Coppotelli H. Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*. 1982; 18:557–570.10.1037/0012-1649.18.4.557
- Coie JD, Kupersmidt JB. A behavioral analysis of emerging social status in boys' groups. *Child Development*. 1983; 54:1400–1416.10.2307/1129803
- Coie JD, Lochman JE, Terry R, Hyman C. Predicting early adolescent disorder from childhood aggression and peer rejection. *Journal of Consulting and Clinical Psychology*. 1992; 60:783–792.10.1037/0022-006X.60.5.783 [PubMed: 1401394]
- Conduct Problems Prevention Research Group (CPPRG). A developmental and clinical model for the prevention of conduct disorder: The FAST Track Program. *Development and Psychopathology*. 1992; 4:509–527.10.1017/S0954579400004855
- DeRosier ME, Kupersmidt JB, Patterson CJ. Children's academic and behavioral adjustment as a function of the chronicity and proximity of peer rejection. *Child Development*. 1994; 65:1799–1813.10.1111/j.1467-8624.1994.tb00850.x [PubMed: 7859556]
- Durlak JA, Weissberg RP, Dymnicki AB, Taylor RD, Schellinger K. The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*. 2011; 82:474–501.10.1111/j.1467-8624.2010.01564.x
- Dishion TJ, Dodge KA. Peer contagion in interventions for children and adolescents: Moving towards an understanding of the ecology and dynamics of change. *Journal of Abnormal Child Psychology*. 2005; 33:395–400.10.1007/s10802-005-3579-z [PubMed: 15957566]
- Dishion, TJ.; Piehler, TF.; Myers, MW. Dynamics and ecology of adolescent peer influences. In: Prinstein, MJ.; Dodge, KA., editors. *Understanding Peer Influence in Children and Adolescents*. New York: Guilford; 2008. p. 72-93.

- Dison TJ, Tipsord JM. Peer contagion in child and adolescent social and emotional development. *Annual Review of Psychology*. 2011; 62:10.1146/annurev.psych.093008.100412
- Dodge KA, Coie JD, Pettit GS, Price JM. Peer status and aggression in boys' groups: Developmental and contextual analyses. *Child Development*. 1990; 61:1289–1309.10.1111/j.1467-8624.1990.tb02862.x [PubMed: 2245725]
- Espele DL, Holt MK, Henkel RR. Examination of peer group contextual effects on aggressive behavior during early adolescence. *Child Development*. 2003; 74:205–220.10.1111/1467-8624.00531 [PubMed: 12625446]
- Estell DB, Cairns RB, Farmer TW, Cairns BD. Aggression in inner-city early elementary classrooms: Individual and peer-group configurations. *Merrill-Palmer Quarterly*. 2002; 48:52–76.10.1353/mpq.2002.0002
- Fabes RA, Hanish LD, Martin CL. Children at play: The role of peers in understanding the effects of childcare. *Child Development*. 2003; 74:1039–1043.10.1111/1467-8624.00586 [PubMed: 12938698]
- Farmer TW, Hollowell JH. Social networks in mainstream classrooms: Social affiliations and behavioral characteristics of students with EBD. *Journal of Emotional and Behavioral Disorders*. 1994; 2:143–155.10.1177/106342669400200302
- Hamre BK, Pianta RC. Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*. 2001; 72:625–638.10.1111/1467-8624.00301 [PubMed: 11333089]
- Hanish LD, Martin CL, Fabes RA, Leonard S, Herzog M. Exposure to externalizing peers in early childhood: Homophily and peer contagion processes. *Journal of Abnormal Child Psychology*. 2005; 33:267–281.10.1007/s10802-005-3564-6 [PubMed: 15957556]
- Hektner JM, August GJ, Realmuto GM. Patterns and temporal changes in peer affiliation among aggressive and nonaggressive children participating in a summer school program. *Journal of Clinical Child Psychology*. 2000; 29:603–614.10.1207/S15374424JCCP2904_12 [PubMed: 11126637]
- Henry D, Guerra N, Huesmann R, Tolan P, VanAcker R, Eron L. Normative influences on aggression in urban elementary school classrooms. *American Journal of Community Psychology*. 2000; 28:59–81.10.1023/A:1005142429725 [PubMed: 10824274]
- Ialongo NS, Poduska JM, Werthamer L, Kellam S. The distal impact of two first-grade preventive interventions on conduct problems and disorder in early adolescence. *Journal of Emotional and Behavioral Disorders*. 2001; 9:146–160.10.1177/106342660100900301
- Kellam SG, Ling X, Merisca R, Brown CH, Ialongo N. The effect of the level of aggression in the first grade classroom on the course and malleability of aggressive behavior into middle school. *Development and Psychopathology*. 1998; 10:165–185.10.1017/S0954579498001564 [PubMed: 9635220]
- Kupersmidt JB, Burchinal M, Patterson CJ. Developmental patterns of childhood peer relations as predictors of externalizing behavior problems. *Development and Psychopathology*. 1995; 7:825–843.10.1017/S0954579400006866
- Kupersmidt JB, Coie JD. Preadolescent peer status and aggression as predictors of externalizing behavior problems in adolescence. *Child Development*. 1990; 61:1350–1362.10.1111/j.1467-8624.1990.tb02866.x [PubMed: 2245729]
- Lacourse E, Nagin D, Tremblay RE, Vitaro F, Claes M. Developmental trajectories of boy's delinquent group membership and facilitation of violent behaviors during adolescence. *Development and Psychopathology*. 2003; 15:183–197. 10.1017.S0954579403000105. [PubMed: 12848441]
- Laird RD, Jordan KY, Dodge KA, Pettit GS, Bates JE. Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Development and Psychopathology*. 2001; 13:337–354.10.1017/S0954579401002085 [PubMed: 11393650]
- Miller-Johnson S, Coie JD, Maumary-Gremaud A, Bierman K. CPPRG. Peer rejection and aggression and early starter models of conduct disorder. *Journal of Abnormal Child Psychology*. 2002; 30:217–230.10.1023/A:1015198612049 [PubMed: 12041708]

- Multisite Violence Prevention Project. The ecological effects of universal and selective violence prevention programs for middle school students: A randomized trial. *Journal of Consulting and Clinical Psychology*. 2009; 77:526–542.10.1037/a0014395 [PubMed: 19485593]
- Patterson GR, Dishion TJ, Yoerger K. Adolescent growth in new forms of problem behavior: Macro- and micro-peer dynamics. *Prevention Science*. 2000; 1:3–13.10.1023/A:1010019915400 [PubMed: 11507792]
- Patterson, GR.; Reid, JB.; Dishion, TJ. *Antisocial boys*. Eugene, OR: Castalia; 1992.
- Schwartz D, McFadyen-Ketchum S, Dodge KA, Pettit GS, Bates JE. Early behavior problems as a predictor of later peer group victimization: Moderators and mediators in pathways of social risk. *Journal of Abnormal Child Psychology*. 1999; 27:191–201.10.1023/A:1021948206165 [PubMed: 10438185]
- Snyder J. Peer relationships of young children: Affiliative choices and the shaping of aggressive behavior. *Journal of Clinical Child Psychology*. 1997; 26:145–156.10.1207/s15374424jccp2602_3 [PubMed: 9169375]
- Snyder J, Schrepferman L, McEachern A, Barner S, Johnson K, Provines J. Peer deviancy training and peer coercion: Dual processes associated with early-onset conduct problems. *Child Development*. 2008; 79:252–268.10.1111/j.1467-8624.2007.01124.x [PubMed: 18366422]
- Snyder J, McEachern A, Schrepferman L, Just M. Contribution of peer deviancy training to the early development of conduct problems: Mediators and Moderators. *Behavior Therapy*. 2010; 41:317–328.10.1016/j.beth.2009.05.001 [PubMed: 20569781]
- Snyder J, Schrepferman L, Oeser J, Patterson G, Stoolmiller M, Johnson K, Snyder A. Deviancy training and association with deviant peers in young children: Occurrence and contribution to early-onset conduct problems. *Development and Psychopathology*. 2005; 17:397–413.10.1017/S0954579405050194 [PubMed: 16761551]
- Stearns E, Dodge KA, Nicholson M. CPPRG. Peer contextual influences on the growth of authority-acceptance problems in early elementary school. *Merrill-Palmer Quarterly: Journal of Developmental Psychology*. 2008; 54:208–231.10.1353/mpq.2008.0018
- Stormshak EA, Bierman KL, Bruschi C, Dodge KA, Coie JD. CPPRG. The relation between behavior problems and peer preference in different classroom contexts. *Child Development*. 1999; 70:169–182.10.1111/1467-8624.00013 [PubMed: 10191521]
- Thomas D, Bierman K, Powers CJ. CPPRG. The influence of classroom aggression and classroom climate on the early development of aggressive-disruptive behavior problems in school. *Child Development*. 2011; 82:751–757.10.1111/j.1467-8624.2011.01586.x [PubMed: 21434887]
- Thomas DE, Bierman KL. CPPRG. The impact of classroom aggression on the development of aggressive behavior problems in children. *Development and Psychopathology*. 2006; 18:471–487.10.1017/S0954579406060251 [PubMed: 16600064]
- Warren K, Schoppelrey S, Moberg DP, McDonald M. A model of contagion through competition in the aggressive behaviors of elementary school students. *Journal of Abnormal Child Psychology*. 2005; 33:283–292.10.1007/s10802-005-3565-5 [PubMed: 15957557]
- Werner NE, Crick NR. Maladaptive peer relationships and the development of relational and physical aggression during middle childhood. *Social Development*. 2004; 13:495–514.10.1111/j.1467-9507.2004.00280.x
- Werthamer-Larsson L, Kellam SG, Wheeler L. Effect of first-grade classroom environment on shy behavior, aggressive behavior, and concentration problems. *American Journal of Community Psychology*. 1991; 19:585–602.10.1007/BF00937993 [PubMed: 1755437]
- Wright JC, Giammarino M, Parad HW. Social status in small groups: Individual-group similarity and the social “misfit”. *Journal of Personality and Social Psychology*. 1986; 50:523–536.10.1037/0022-3514.50.3.523

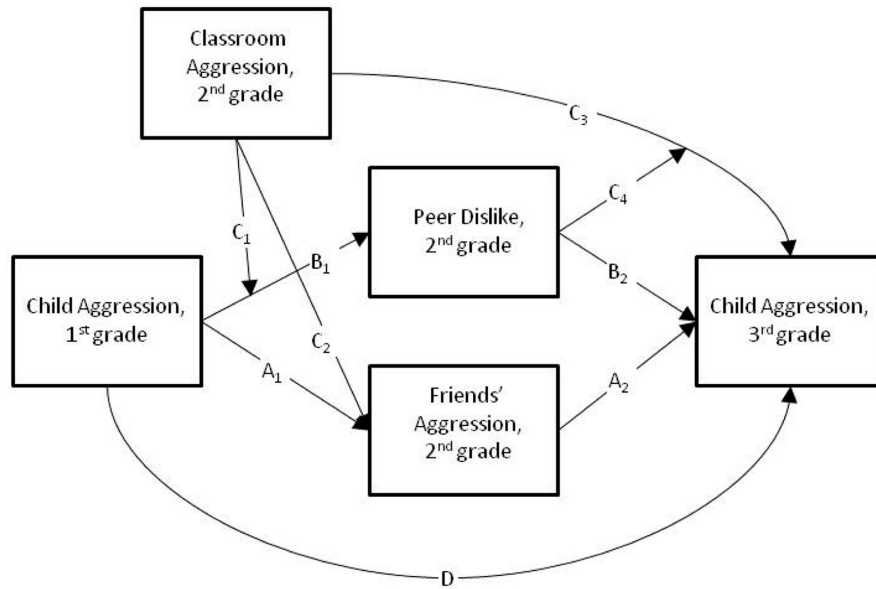


Figure 1. Hypothesized model of peer experiences and aggression

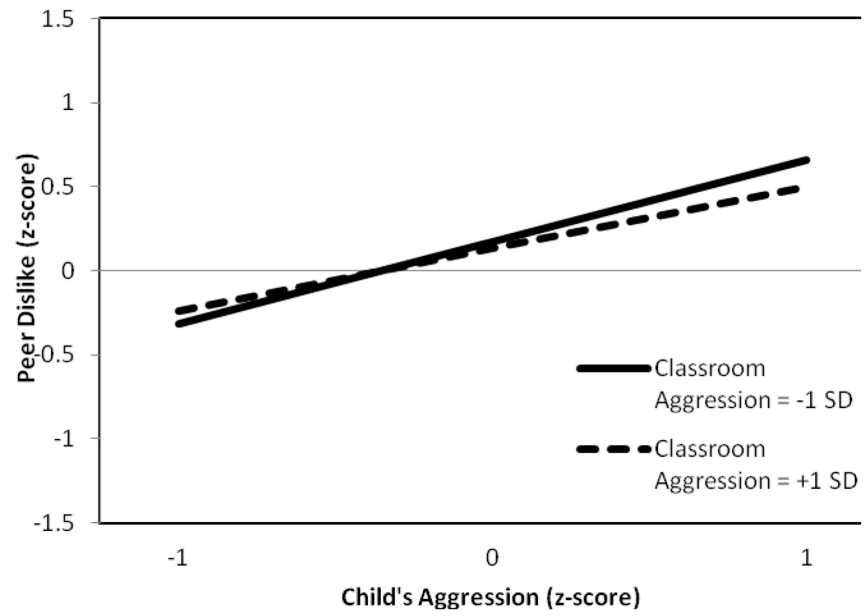


Figure 2. Attenuated impact of child aggression on peer dislike in classrooms characterized by higher levels of student aggression

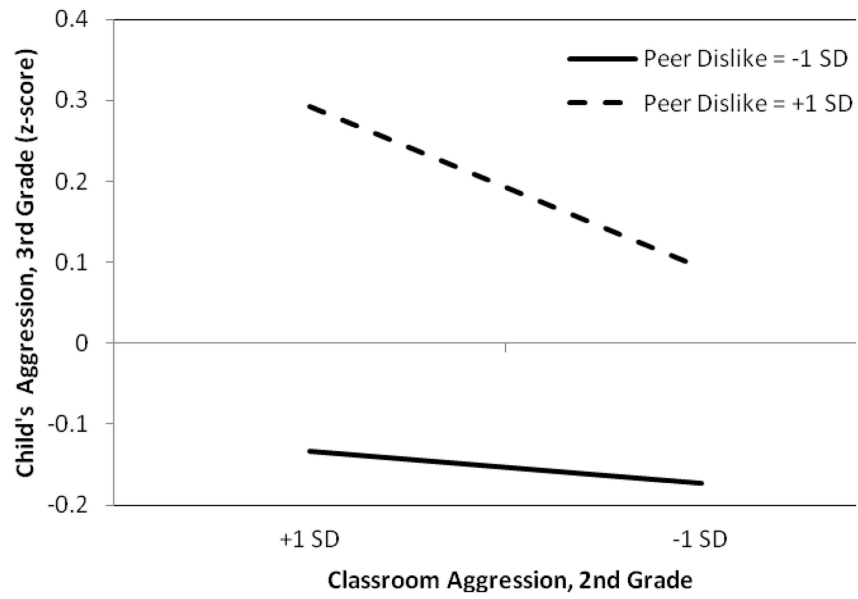


Figure 3. Amplified impact of second grade classroom aggression on third grade child aggression (conditional on 1st grade aggression) for children who are more disliked by peers

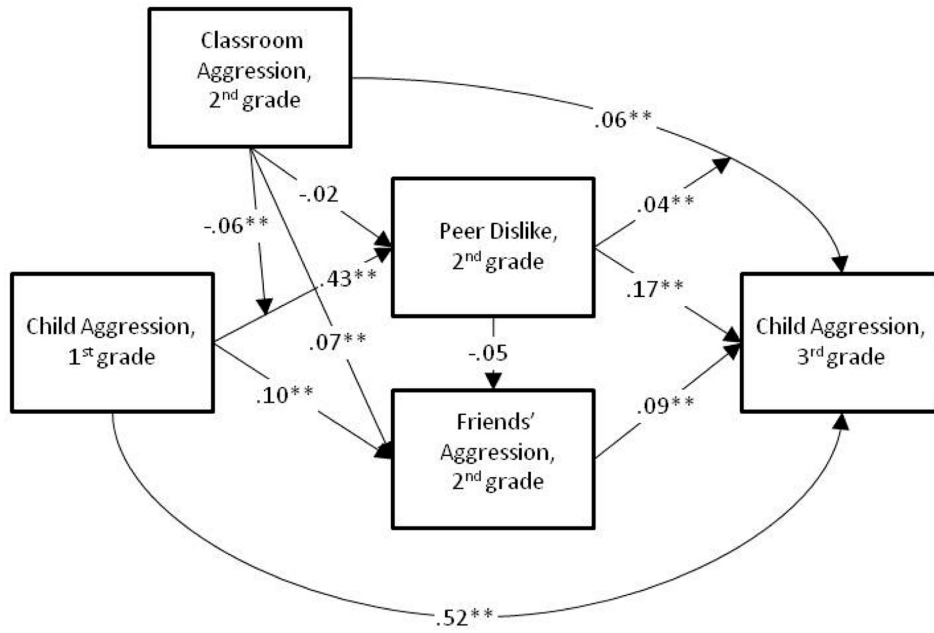


Figure 4. Summary of MLM results

Table 1

Descriptive Statistics

| Variables | Males | | | Females | | |
|---------------------------------|------------|-------------|-------------|------------|-------------|-------------|
| | Mean (SD) | Range | Range | Mean (SD) | Range | Range |
| Child's Aggression, first grade | 1.2 (1.1) | 0 to 5 | 0 to 4.8 | .80 (.93) | 0 to 4.8 | 0 to 4.8 |
| Child's Aggression, third grade | 1.3 (1.1) | 0 to 4.9 | 0 to 4.4 | .81 (.86) | 0 to 4.4 | 0 to 4.4 |
| Peer dislike | -.05 (.27) | -.85 to .88 | -.88 to .71 | -.16 (.23) | -.88 to .71 | -.88 to .71 |
| Friends' Aggression | 1.1 (.61) | 0 to 3 | 0 to 3 | .57 (.49) | 0 to 3 | 0 to 3 |
| Classroom Aggression | 1.1 (.45) | 0 to 2.2 | 0 to 2.2 | 1.1 (.44) | 0 to 2.2 | 0 to 2.2 |

NOTE: Mean levels for boys and girls are significantly different ($p < .05$) for all variables except Classroom Aggression, which is not significantly different.

Table 2

Correlations among Measures.

| Measures | (2) | (3) | (4) | (5) |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|
| (1) Child Aggression, first grade | 0.59 ^{**} | 0.37 ^{**} | 0.22 ^{**} | 0.24 ^{**} |
| (2) Child Aggression, third grade | | 0.38 ^{**} | 0.24 ^{**} | 0.21 ^{**} |
| (3) Peer Dislike | | | 0.14 ^{**} | 0.00 |
| (4) Friend Aggression | | | | 0.12 ^{**} |
| (5) Classroom Aggression | | | | |

Note: Peer dislike, friend aggression, and classroom aggression are all measured in second grade. Correlations were based on all available pair-wise data (all n > 2000).

* $p < .05$.

** $p < .01$

Table 3
Predicting Second Grade Peer Relations

| | Dependent Variables | | |
|---|---------------------|-----------------------------|-----------------------------|
| | Peer Dislike | Aggressive Friends: Model 1 | Aggressive Friends: Model 2 |
| Intercept | .15 (.05) | .48 (.06) | .46 (.06) |
| Level 1: Child Characteristics | | | |
| Sex | -.28 (.03) ** | -.85 (.03) ** | -.82 (.03) ** |
| Child Aggression, first grade | .43 (.02) ** | .10 (.02) ** | .08 (.02) ** |
| Peer Dislike, second grade | -- | -- | .05 (.03) |
| Level 2: Classroom Characteristics | | | |
| Classroom Aggression | -.02 (.02) | .07 (.04) * | .08(.04) * |
| Child Aggression X Class Aggression | -.06 (.02) ** | -- | -- |
| Random effects for conditional model | | | |
| μ_{11} : Variance of Classroom Intercepts | .008 (.007) | .15(.02) ** | .14 (.02) ** |
| μ_{22} : Variance of Classroom Slopes | .013 (.008) * | .02 (.01) ** | .06 (.01) ** |
| μ_{21} : Covariance of Classroom Intercept & Slopes | -.003 (.005) | .05 (.01) ** | -.03 (.01) * |
| δ_{11} : Variance of School Intercepts | .041 (.015) ** | .06 (.03) * | .05 (.02) * |
| χ^2 (df) | 65.55 (4) ** | 278.64 (4) ** | 322.62 (4) ** |
| r: Individual-level variance(SD) | .77 (.02) ** | .58 (.02) ** | .55 (.02) ** |

Note: Standardized coefficients are shown. Model 1 tests homophily with child and classroom aggression predicting aggressive friends; model 2 tests homophily by exclusion with peer dislike as an additional predictor of aggressive friends.

* $p < .05$.

** $p < .01$.

Table 4
Predicting Third Grade Child Aggression from Second Grade Peer Experiences

| | Standardized Coefficients |
|--|---------------------------|
| Intercept | .02 (.04) |
| Level 1: Child Characteristics | |
| Sex | -.10 (.04) * |
| Child Aggression, Spring first grade | .52 (.02) ** |
| Peer Dislike, second grade | .17 (.02) ** |
| Friends' Aggression, second grade | .09 (.02) ** |
| Level 2: Classroom Characteristics | |
| Classroom Aggression | .06 (.03) * |
| Classroom Aggression X Peer Dislike | .04 (.02) * |
| Random effects for conditional model | |
| μ_{11} : Variance of Classroom Intercepts | .10 (.02) ** |
| μ_{22} : Variance of Classroom Slopes, Aggression | .01 (.01) |
| μ_{33} : Variance of Classroom Slopes, Friends' aggression | .03 (.01) * |
| μ_{21} : Covariance of Classroom Intercept & Agg. Slopes | .01 (.01) |
| μ_{31} : Covariance of Classroom Intercept & Fr. Agg. | .02 (.01) * |
| Slopes | |
| μ_{32} : Covariance of Classroom Agg. and Fr. Agg. Slopes | -.02 (.01) * |
| δ_{11} : Variance of School Intercepts | .03 (.01) ** |
| χ^2 (df) | 146.61 (3) ** |
| r: Individual-level variance(SD) | .42 (.02) ** |

* $p < .05$.

** $p < .01$.