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PEER INFLUENCES ON AGGRESSION WITHIN AN AGGRESSIVE CLASSROOM

CONTEXT

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Abstract

This study examined three concurrent types of peer influence on the development of child aggression during the early elementary school years (grades 1-3): 1) low social preference among classmates, 2) friendships with aggressive peers, and 3) placement in a classroom characterized by high levels of peer aggression. This study drew from a large, diverse sample of 4096 children (from 27 schools at 4 sites). Teacher ratings assessed child aggression in 1st and 3rd grade, and were averaged across classmates to assess classroom aggression in 2nd grade. Sociometric interviews in 2nd grade provided measures of peer-nominated aggression, reciprocated friendships, and social preference. Results indicated that, controlling for initial levels of aggression, low social preference and having aggressive friends exerted distinct, independent influences on aggressive behavior measured a year later. Classroom aggression exerted both a direct impact on child aggression, serving as a third source of peer influence, and it exerted an indirect impact by influencing the impact of social preference and aggressive friends on child aggression. In classrooms characterized by higher levels of peer aggression, the prevalence of friendships with aggressive peers increased. In addition, in classrooms characterized by higher levels of peer aggression, the impact of aggressive behavior on social preference was attenuated and aggressive children were less disliked.

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Introduction

Stable aggression early in childhood predicts serious criminal and delinquent acts in early adulthood (Moffitt, 1993). Aggressive behavior also predicts social problems such as peer rejection (Coie, Lochman, Terry, & Hyman, 1992; Newcomb, Bukowski, & Pattee, 1993) and academic problems such as low achievement (Hinshaw, 1992; Wentzel, 1991). High levels of aggressive behavior in elementary school increase risk that a child will affiliate with antisocial peers in adolescence, fueling substance use and delinquent activities (Dishion, Capaldi, Spracklen, & Li, 1995; Moffitt, 1993). Aggressive children are more likely to become bullies (Farrington, 1993), thereby negatively affecting the mental health of their peers (Storch & Ledley, 2005).

While estimates of the stability of individual differences in aggression are moderate to high, with estimates ranging from .25 to .70 (Huesmann, Eron, Lefkowitz, & Walder, 1984; Olweus, 1979), the normative trend in aggression is to decrease sharply prior to elementary school entry and then gradually during the first few years of elementary school (Loeber & Hay, 1997). Evidence suggests that those children who enter school with low levels of aggression rarely increase, and those who enter with moderate levels of aggression but desist over time have similar outcomes to children who were never aggressive (Nagin & Tremblay, 1999).

Some children, however, do not follow a normative developmental path to lower aggression. They enter elementary school exhibiting moderate to high levels of aggressive behavior, which maintain over time. Longitudinal studies show that the emergence of serious antisocial activities in early adolescence is strongly predicted by individual differences in aggression, hyperactivity, inattention, and prosocial skill deficits evident at school entry (Flanagan et al., 2003; Loeber & Dishion, 1983). However, evidence that some children show

declines in aggressive behavior during elementary school, whereas others show stable, high levels of aggression suggests that socialization influences at school may affect the developmental course of aggressive behaviors. In particular, peer influence may play a role, as researchers have found that both peer rejection and affiliation with deviant peers predict aggressive and antisocial behavior, after controlling for the child's aggressive behavior (Coie, 1990; Patterson, Capaldi, & Bank, 1991; Thomas, Bierman, & CPPRG, 2006).

The purpose of this study is to better understand the impact of school experiences on aggression, by examining peer influences that may affect the developmental course of aggressive behavior during the initial years of elementary school. Two mechanisms of peer influence that are frequently proposed to account for increases in aggression are peer rejection of aggressive children (e.g. Coie et al., 1992; Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & CPPRG, 2002) and the association with and influence of aggressive friends (Cairns, 1979). Theorists have proposed a developmental cycle in which aggressive child behavior leads to rejection by mainstream peers, increasing the likelihood that aggressive children will choose each other as friends and mutually reinforce antisocial attitudes and behaviors (Coie, 1990; Patterson, Capaldi, & Bank, 1991). However, rarely are peer rejection and deviant peer affiliation measured in the same study.

Recent research suggests that hypotheses concerning the developmental relation between peer rejection, deviant peer affiliation, and the escalation of aggressive behavior may need to be modified in two important ways. First, initial developmental models proposed that aggressive children experience peer rejection during elementary school, leading to affiliation with deviant friends at the transition into adolescence (Coie, 1990; Patterson, Capaldi, & Bank, 1991). However, more recent research suggests that aggressive children may select aggressive friends

and be influenced by them much earlier – during the initial elementary grades (Snyder et al., 2005). This study examined the influence of peer rejection and affiliation with aggressive friends simultaneously, examining their developmental interplay and influence on child aggression in a short-term longitudinal study extending from first to third grade.

Second, a growing body of work suggests that the classroom composition and corresponding social norms that exist in elementary classrooms may influence the acceptability of aggressive behavior to peers, thereby fundamentally altering the likelihood that aggressive behavior will elicit peer rejection (Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999). No prior study has examined how classroom contexts affect the impact of peer rejection and affiliation with aggressive peers as dual pathways of peer influence on child aggression. This study tests the hypothesis that the likelihood of peer rejection and the likelihood of friendships with aggressive peers are affected by the mean level of peer aggression in an elementary classroom.

Influence of Peer Rejection

In typical peer groups, children who behave aggressively are rejected by their peers and ostracized from normative peer interactions because of their coercive, unpleasant behavioral style. Studies examining the developmental emergence of peer rejection in newly formed peer groups show that children who exhibit verbal or physical aggression are quickly rejected by others in the group (Coie & Kupersmidt, 1983; Dodge, 1983; Dodge, Coie, Pettit, & Price, 1990). Furthermore, while rejected children display more verbally and physically aversive behavior than other children, they are perceived by their peers to be even more aggressive and disruptive than observer ratings indicate. This may indicate a reputational bias which is also likely to maintain the child's low status and social isolation (Coie & Kupersmidt, 1983).

Once rejected, children are forced to play with other aggressive, less socially skillful, or otherwise marginalized peers, thereby experiencing a less socially rich environment than the one experienced by non-rejected peers (Ladd, 1983; Putallaz & Gottman, 1979). Low social preference predicts increased rates of solitary play, indicating that children are either excluded from mainstream peer groups or that they self-select themselves out of such groups (Dodge et al., 1990). Rejected children experience less exposure to the types of social exchanges—discussion, negotiation, and play with peers-- that lead to competence in peer interactions. Over time, the “socialization gap” widens and leads to relatively less skillful behavior and further negative experiences with peers (Dishion, Loeber, Stouthamer-Loeber, & Patterson, 1984). Children who were aggressive prior to experiencing peer rejection thus have even fewer opportunities to model and practice peaceful conflict management (Chen, 2003; Dishion, Patterson, & Griesler, 1994; Patterson, 1982).

As normative peers learn to expect hostile retaliation from aggressive children, they often become self-protective, using proactive exclusionary and hostile tactics to keep the disliked child at a distance (Atlas & Pepler, 1998; Olson, 1992). In the absence of a more socially skillful repertoire of play and negotiation strategies, and when faced with reactive hostility from peers, rejected children become even more likely to respond with aggression in social settings (Tedeschi & Felson, 1994)

Several longitudinal studies across different age ranges have confirmed that rejection predicts later aggression even after controlling for initial levels of a child’s behavior problems (Bierman, Smoot, & Aumiller, 1993; Bierman & Wargo, 1995; Coie et al., 1992; Dodge et al., 2003; Miller-Johnson et al., 2002). Coie and colleagues (1992) demonstrated that sociometric ratings in third grade predicted teacher ratings of poor adjustment (a combination of academic

and externalizing items) in sixth grade. Miller-Johnson and colleagues (2002) found that, even after controlling for initial levels of aggression, rejection in first grade predicted both the diagnosis of ODD/CD as well as dimensional measures of conduct problems in third and fourth grades respectively. Bierman and Wargo (1995) demonstrated that being aggressive and rejected increased the stability of aggressive behavior. Together, these studies provide support for the hypothesis that the experience of peer rejection may cause an increase in aggressive behavior beyond that which is predicted based on a child's prior aggression.

From a developmental perspective, the early elementary school years are pivotal for the emergence of this maladaptive pathway, in which aggressive behavior at school entry contributes to problematic peer relations, which lead to isolation and hostile peer treatment, thus impairing the development of prosocial skills and exacerbating aggressive behavior (Bierman, 2004; Coie, 1990). The experience of social alienation in elementary school, combined with a well-developed repertoire of aggressive behaviors, often fuels escalations into more serious antisocial activities and violence as children move into adolescence (Patterson, Capaldi, & Bank, 1991). The social opportunities for affiliation with other aggressive youth that arise in middle school are posited to play a key role in the escalation of antisocial activity.

Deviant Peer Affiliation in Adolescence

The transition into adolescence is accompanied by major structural changes in the school and peer context, which are associated with increases in antisocial behaviors among high-risk youth and a significant shift in the relation between aggressive behavior and peer status. That is, between the ages of 11-14, most children in America make a transition from self-contained elementary classrooms to the larger, fluid multi-class organization of the middle or junior high school. With this transition, the peer group becomes much larger, increasing the number of

children who, as a group, are alienated from mainstream peer affiliation. Combined with the greater levels of autonomy afforded to adolescents and corresponding decreases in adult supervision, the opportunities for deviant activities with peers increase dramatically. Associated with this shift, researchers have identified changes in the way aggressive youth are evaluated by their peers as well as in the saliency of peer processes that encourage aggressive behavior.

Although aggressive-disruptive behaviors continue to elicit rejection by “mainstream” peers during early adolescence, the larger social structure of middle schools allows for the aggregation of peers who share antisocial orientations (Dishion, Andrews, & Crosby, 1995). A phenomenon referred to as “perceived popularity” emerges, signaling a shift in the social status of some aggressive youth. Unlike sociometric popularity (e.g., children who are nominated by many peers as “liked” and by few peers as “disliked”), children who are labeled “popular” by peers are those who have high levels of social impact as a function of their leadership positions in salient crowds. Youth who are able to use proactive aggression to exert peer dominance often achieve social visibility and “perceived popularity” (Cillessen & Rose, 2005). Hence, the degree to which peer rejection fuels ongoing aggression is thought to decrease in early adolescence, replaced by peer influence that operates primarily through affiliation with deviant peers (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Patterson, Reid, & Dishion, 1992).

Affiliating with a deviant peer group does not occur by chance, but rather aggressive, delinquent children tend to selectively affiliate with other aggressive, delinquent children who have similar positive attitudes toward risk-taking and antisocial activities in a process known as homophily (Cairns, 1979; Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Farmer & Hollowell, 1994). The finding that adolescents tend to select their affiliates based on similar levels of aggressive behavior is robust even in populations with a highly restricted range of

aggressive behavior, such as incarcerated juvenile offenders (Clarke-McLean, 1996). Similarity appears to promote affiliation among youth who share antisocial attitudes and proclivities, and, once affiliated, these youth appear to influence each others' behavior in ways that promotes ongoing (and escalating) antisocial activity (Patterson, Dishion, & Yoerger, 2000; Thornberry & Krohn, 1997).

Groups or dyads of deviant peers may influence each other in several ways (Dishion & Dodge, 2005). One key mechanism is deviancy training, in which friendship dyads of deviant boys display higher rates of deviant talk, and preferential reinforcement of deviant behaviors and ideas than non-deviant dyads (Dishion, Spracklen, Andrews, & Patterson, 1996). Dishion and colleagues (1996) videotaped 13 and 14 year olds and their friends in a 25 minute session designed to elicit a variety of interactive behaviors. Dyads in which both members had been arrested within one-year of the study exhibited rates of deviant talk that were over four times greater than that of dyads where neither member had been arrested in the past year, and more than twice that of dyads with only one deviant member. Deviant dyads also exhibited a qualitatively different interaction pattern, selectively providing positive feedback to deviant talk by laughing, whereas non-deviant dyads laughed at normative talk and did not laugh at deviant talk. Among both deviant and non-deviant dyads, positive reinforcement of deviant talk predicted self-reports of delinquent behavior 2 years later.

Association with deviant peers is a reliable predictor of delinquent activity, particularly during adolescence, (see Thornberry & Krohn, 1997 for a review). Evidence of deviant peer influences have been found within dyadic relationships (Dishion et al., 1996), within deviant peer groups in naturalistic settings (Patterson, Reid, & Dishion, 1998), and even within groups of

deviant children who are grouped together for the purposes of intervention (Dishion, McCord, & Poulin, 1999).

Peer Rejection and Deviant Peer Affiliation in Early Elementary School

Most models of peer influence on aggression suggest that peer rejection is the primary peer influence on aggression during the early elementary years, and that it creates a proclivity in preadolescence to affiliate with deviant peers, who then reinforce and support a broad range of antisocial activities (Coie, 1990; Dishion et al., 1991). However, several recent studies suggest that among aggressive children selective affiliation with aggressive friends may occur earlier than previously thought, influencing the developmental course of aggressive behavior during the early elementary school years (Estell, Cairns, Farmer, & Cairns, 2002; Farver, 1996; Hanish, Martin, Fabes, Leonard, & Herzog, 2005; Snyder, 1997; Snyder et al., 2005).

As early as pre-school, children are selective about who they spend time with; they spend most of their time with a few children and very little time with most children (Snyder, West, Stockemer, Gibbons, & Almquist-Parks, 1996). Furthermore, groups of pre-school and kindergarten children have the same tendency as adolescents to affiliate with other children who display similar levels of aggressive behavior (Farver, 1996; Snyder, 1997; Snyder et al., 2005). Similarly to adolescents, spending time with externalizing peers (Hanish et al., 2005) or engaging in higher rates of deviant talk (Snyder et al., 2005) also increases aggressive behavior in children in kindergarten. This group of studies indicates that the influence of aggressive peers is not limited to adolescents, and, in fact, may play a role in the development of aggressive behavior at significantly earlier ages than previously thought.

These recent findings raise questions about the relative role of peer rejection vs. deviant peer affiliation as dual influences exacerbating aggression during the elementary school years. It

is possible that both influences operate concurrently; that is, peer rejection may limit the friendship choices of aggressive children, leaving them with few friendship choices other than their aggressive peers. At the same time, homophily may increase the attraction that aggressive children feel toward each other, promoting friendships among them. Hence, rejection and homophily may work together to increase the likelihood that aggressive-rejected children form mutual friendships with other aggressive children. Many rejected children (39% in one study) have at least one reciprocated friend (Gest, Graham-Bermann, & Hartup, 2001), and aggressive grade-school children have repeatedly been shown to be both disliked by the majority of their classmates, and, at the same time, to have reciprocated friendships (Coie & Kupersmidt, 1983; Hektner, August, & Realmuto, 2000; Miller-Johnson et al., 2002). Thus, being rejected does not exclude one from having deviant friends and having deviant friends does not save one from being rejected.

Only one previous study has directly examined the concurrent influence of reciprocated friendships among aggressive youth and peer rejection in elementary school (Werner & Crick, 2004). Werner and Crick (2004) examined peer influence on relational and physical aggression in second to fourth grade boys and girls. They found support for two distinct types of influence. Initial levels of both peer rejection and reciprocated friendships with aggressive peers concurrently predicted increases in physical aggression the following year for both boys and girls, controlling for initial levels of aggression. Studying a later developmental age, Laird, Jordan, Dodge, Pettit and Bates (2001) also found evidence for multiple pathways of peer influences (albeit at two different developmental periods). They found that peer rejection in elementary school and antisocial peer involvement in early adolescence concurrently predicted externalizing problems at age 14, after controlling for kindergarten externalizing problems.

These two studies suggest both types of peer influence may act together to exacerbate a child's aggressive behavior. However it remains unclear whether both influences are active during the initial years of elementary school when patterns of school-based behavior are stabilizing.

In addition to the questions about concurrent influence, there are also questions about the degree to which the exclusion from normative peers associated with rejection versus the attraction to other aggressive youth associated with homophily contribute to the formation of friendships among aggressive children in early elementary school. It is commonly suggested that aggressive children affiliate with each other because they are rejected from the normative peer group and befriend those children who are still accessible to them, namely other aggressive, rejected children (selection by exclusion) (Coie, 1990). In contrast, the theory of homophily suggests that aggressive children are attracted to each other because of similar interests and reciprocal positive reinforcement of their aggressive behavior (selection by attraction) (Cairns et al., 1988). These two models predict different relations between peer rejection and friendships among aggressive youth. According to the first "exclusion" model, being rejected by peers should increase the likelihood of forming friendships with aggressive youth. According to the second "homophily" model, the attraction of aggressive children to each other and the corresponding formation of friendships should occur independently, regardless of social preference and the availability of alternative friendship possibilities.

The exclusion model is supported in a study by Hektner and colleagues (2000), who looked at the temporal patterns in friendships of aggressive and non-aggressive children over the course of a 6 week summer school program. These researchers found that, whereas a homophily model would suggest aggressive children would preferentially nominate other aggressive children as friends, aggressive children tended to preferentially nominate non-aggressive

individuals. They also found that aggressive children had fewer reciprocated friendships on average and had fewer reciprocated friendships at the end of the program than at the beginning. In other words, although aggressive children preferred to befriend nonaggressive peers, they had difficulty establishing such friendships and also had difficulty maintaining the friendships they did initiate.

In contrast to Hektner's study, two other studies suggest that it is homophily, rather than rejection that predicts affiliation with aggressive peers. Werner and Crick (2004) found that after controlling for initial levels of peers' and a child's own aggression, peer rejection actually predicted less physical aggression among boys' friends, and no difference in aggression among girls' friends. Laird and colleagues (2001) found that, after controlling for a child's own externalizing behavior, there was no relationship between rejection and antisocial peer involvement.

Snyder and colleagues (1997) found some support for both models. They found that while aggressive children were more likely to have mutual friendships with other aggressive children, there was no statistical difference between aggressive and non-aggressive children in the pattern of unilateral friendship nominations. This suggests that aggressive children find non-aggressive children to be acceptable as friends, but non-aggressive children are less likely to reciprocate such feelings, supporting the exclusion model. However, Snyder also examined rates of affiliation between a target child and a peer compared to the rate of positive behaviors expressed by the peer towards the target child, and found that both aggressive and non-aggressive children spent the most time with peers with the highest rate of positive responding. This supports the homophily model, suggesting that aggressive children provide a more positive reinforcement to other aggressive children, than non-aggressive children.

These studies suggest that the relationship between aggressive behavior, peer rejection, and the affiliation with aggressive peers is complex. This complexity may be explained by empirical research that suggests that these relationships may be influenced by aggressive classroom contexts. In one classroom, an aggressive child may be likely to find themselves excluded, and struggle to maintain whatever social relationships he or she has access to, while in another classroom, the same child may find themselves in a mutually reinforcing social group of several other similarly aggressive children.

Influence of Classroom Context on Aggression

An increasing number of studies indicate that elementary classrooms with higher rates of aggressive behavior are associated with the growth in an individual's aggressive behavior (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Stearns, Dodge, Nicholson, & CPPRG, in press; Thomas, et. al., 2006; Warren, Schoppelrey, Moberg, & McDonald, 2005). Kellam and colleagues (1998), in one of the first studies to show the negative effect of aggressive classroom contexts, examined nineteen public elementary schools. They assessed the degree to which each classroom context was "aggressive" by averaging teacher ratings of the level of aggressive behavior displayed by each individual student in the classroom. They found that aggressive boys who were in first-grade classrooms characterized by higher levels of overall student aggression were significantly more likely to be rated as aggressive in sixth grade than similarly aggressive boys placed in less aggressive first grade classrooms. These results are remarkable due to the length of time between the initial assessment and follow-up, but the effect was limited to the most aggressive quartile of boys, and did not hold for girls or for the sample as a whole.

Since Kellam's initial study, effects of an aggressive context on the sample as a whole have been found and replicated. Boxer, Edwards-Leeper, Goldstein, Musher-Eizenman, and Dubow (2003), studying school-level rather than classroom-level exposure to aggressive behavior, found that exposure to even relatively mild forms of aggression was associated with more aggressive behavior among fourth, fifth, and sixth graders. Barth and colleagues (2004) examined students over a two year period from fourth to fifth grade and found that more aggressive classroom environments were associated with greater individual-level aggression. While Barth and colleagues replicated Kellam's finding that aggressive classroom environments were most toxic for the most aggressive children, they found a larger main effect for average classroom aggression, indicating that aggressive classroom environments affect the aggression of children in general, not just aggressive boys.

Thomas and colleagues (2006), using the same sample population as the current study, examined different temporal patterns of exposure to high-aggression classrooms from first to third grade (exposure in first grade only vs. exposure in the most recent year vs. chronic exposure). Controlling for a child's aggression in kindergarten, these researchers found that a chronic pattern of exposure predicted more aggressive behavior in third grade compared with other patterns of exposure. Thomas' findings indicate that classrooms where aggressive behavior is commonplace have a lasting effect on a child's aggression, particularly when exposure to these classrooms is experienced repeatedly.

Based on the idea that children are more heavily influenced by peers with whom they interact with most frequently, Stearns and colleagues (in press) examined the effects of mean levels of teacher-rated aggression of same-gender and same-ethnicity classmates on an individual's aggression in grades 2 and 3. Using the same schools as the current study but a

different sample population, this study again replicated the result that classroom averages (in this case, both same-gender and same-ethnicity classroom averages) predicted increases in a child's aggression, controlling for first grade aggression. Interestingly, opposite-gender and opposite-ethnicity classroom averages did not predict a child's growth in aggression, with the exception of the average aggression of third-grade opposite-gender classmates, which was a significant, but less powerful, predictor than the same gender average. The Stearns study provides some evidence that classroom context may have an indirect effect on student behavior that acts through more proximal peer influences.

Effects of Classroom Context on Peer Rejection and Friendships

If classroom context acts through more proximal peer processes, it raises the question as to how context may shape those processes already shown to influence a child's aggressive behavior, namely peer rejection and affiliation with aggressive peers. One way that classroom context may shape a child's behavior is by shaping social norms about aggressive behavior. This hypothesized mechanism of influence derives from Tversky's (1977) social norm theory, in which the social acceptability of a given behavior is heavily influenced by the prevalence of that behavior within a group. Empirical research has shown that the acceptability of aggression varies depending upon the degree to which aggressive behavior is displayed by members of a particular peer group (Boivin, Dodge, & Coie, 1995; Chang, 2004; Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). Stormshak and colleagues (1999), using first grade data from an overlapping sample population with the current study found that the social preference of aggressive children was lower in classrooms where aggression was non-normative. Indeed, among boys, aggression was positively associated with social preference in the most aggressive classrooms. These findings fit the "dissimilarity model" postulated by Tversky (1977), in which

peer disliking is a function of the degree to which an individual's behavior is dissimilar from that of the group. The consequence of the social norming of aggressive behavior in more aggressive classrooms is that aggressive children are more likely to achieve acceptance and may therefore also receive support for their aggressive attitudes and behaviors, rather than experiencing social censure.

Aggressive classroom environments may also influence the number of aggressive friends nominated by a child. This may simply be a function of the greater density of aggressive children in aggressive classrooms. Children tend to befriend other children who are similar to themselves on a variety of characteristics (Haselager, Hartup, van Lieshout, & Riksen-Walraven, 1998). Having more aggressive children in a classroom increases the chances of them being befriended by other children based on other characteristics besides aggression. It may also be that children in aggressive classrooms are likely to have more aggressive friends than similar children in non-aggressive classrooms because aggressive children are less disliked in these classrooms.

Two separate strands of research thus have implications regarding the impact of classroom contexts on the child aggressive behavior and corresponding peer relations. First, children who are placed in classrooms with higher levels of average aggression show higher levels of aggression in future years, when compared with children placed in less aggressive classroom contexts. Second, aggressive classroom contexts reduce the likelihood that aggressive behavior will elicit negative responses by peers, and may thereby increase the formation of friendships with aggressive children. Taken together, these findings raise the question as to whether aggressive classroom environments exert a direct influence, supporting child aggression via their impact on classroom-level social norms, or whether the aggressive contexts influence

child behavior indirectly, via their impact on the proximal peer influences associated with peer rejection and friendship formation.

The Present Study

The present study has two major goals. First, the study will examine the concurrent impact of two types of peer influence -- low social preference and reciprocal friendships with aggressive peers -- on changes in child aggression in a short-term longitudinal study that extends from grades 1 to 3. Prior research suggests that both low social preference and reciprocated friendships with aggressive peers contribute to increased aggression over time, but these two influences are rarely studied concurrently. Prior research also suggests that lower social preference increases the likelihood that children will form friendships with aggressive peers, by increasing the extent to which they are excluded from other friendship networks. By assessing both types of peer influence concurrently, this study will determine the degree to which they are correlated, and the degree of unique (versus shared) influence they exert on changes in child aggression over time.

The second major goal of this study is to better understand the important role that classroom context plays in the development of child aggression at school, and its impact on the peer influence processes associated with child aggression (e.g., social preference and friendships with aggressive classmates). Classroom aggression (e.g., the average level of aggression exhibited by classmates) may have a direct impact on child behavior, serving as a third source of peer influence. Alternatively, classroom aggression may change social norms and friendship patterns, decreasing the likelihood that aggressive children are rejected by peers, but increasing the prevalence of friendships with aggressive classmates. This study will examine the degree to which classroom aggression has a direct influence on growth in child aggression and the degree

to which it exerts an indirect effect, via its impact on social preference and affiliation with aggressive friends.

The study will utilize data from the Fast Track Project, a multi-site study focused on the early development of conduct problems (CPPRG, 1992). Fifty-five schools from four sites participated in the study. In each of these schools, “universal” data was collected for all children in three successive cohorts, following them from first grade through third grade, including teacher ratings of aggression, peer nominations of aggression, and sociometric nominations including “most liked”, “least liked”, and roster ratings of play preferences. Participants in the present study included 4096 children attending twenty-seven control schools who had longitudinal data available from grade 1 to grade 3. Classroom aggression, social preference, and reciprocated friendships with aggressive peers were assessed in second grade.

Growth in child aggression was assessed by examining residual gain in teacher-rated aggression scores in the Spring of third grade, controlling for first grade aggression. Because the child is exposed to a different classroom context and peer group for almost an entire school year prior to the measurement of the dependent variable, these tests are conservative estimates of the immediate impacts of peer influence, but are more robust indicators of the lasting impact of peer influences on the development of aggression. Prior studies have examined peer and contextual influences on a child’s aggression measured concurrently, but there are at least two limitations to this method. First, the direction of effect is unclear (i.e. it is unclear whether peer rejection or deviant friendships caused a child to behave aggressively, or whether a child’s aggression influenced his or her choice of friends and peers’ feelings about him or her). Second, data collected while the child is in the same environment may simply measure the way the child is responding to that specific environment, with the developmental implications for a child during

the following year(s) less clear. By examining peer influences a year later, this study aims to address those limitations and, as a result, provide stronger support for a direction of effect from peer influences to later aggression and evidence for a lasting impact of peer influence.

With regard to the first goal of the study, understanding the relationships between low social preference, friendships with aggressive classmates, and child aggression, the following hypotheses will be tested:

1. Child aggression in first grade will predict both lower social preference and friendships with aggressive classmates in second grade.
2. When considered both independently and then concurrently, low social preference and friendships with aggressive classmates in second grade will predict increased aggression at the end of third grade, controlling for the child's aggression in first grade and gender.
3. Social preference will partially explain the relationship between a child's initial levels of aggression in first grade and the development of friendships with aggressive classmates in second grade.

The large number of classrooms from diverse neighborhoods and locations provides a basis for the second aim of this study, which is to fill a gap in the literature examining how these peer influences on aggressive behavior vary as a function of peer context. We expect that classroom aggression will influence child aggression indirectly, primarily by increasing the peer influence associated with deviant peer affiliation. The specific hypotheses to be tested are:

4. In more aggressive classroom contexts, aggressive behavior will be more acceptable to peers and less likely to produce peer rejection. Specifically, the

mean level of peer aggression characterizing second grade classrooms will moderate the relationship between a child's initial aggression and social preference such that the negative relationship between first grade aggression and second grade social preference will be attenuated in more aggressive classrooms.

5. In more aggressive classroom contexts, children will be more likely to form reciprocated friendships with aggressive classmates, given the greater availability of aggressive peers and their higher level of acceptability
6. The effects of second grade classroom context on children's increased aggression in third grade (controlling for their first grade aggression) is primarily an indirect effect, affecting child aggression by increasing the likelihood that children will form friendships with aggressive classmates.

Method

Participants

Data analyzed in the present study were collected as part of a larger longitudinal investigation of the development and prevention of conduct disorders (Fast Track Program, see CPPRG, 1992). The data are from three consecutive-year cohorts totaling 4096 children (50.6% male) from 210 second grade classrooms in 27 schools from the no-treatment control group. These data are from the “universal” rather than “selected” Fast Track sample, and all eligible children from participating control schools were used in these analyses. The participants were drawn from four demographically and geographically diverse locations in the United States -- Durham, North Carolina, Nashville, Tennessee, Seattle, Washington, and several towns in rural central Pennsylvania—that were selected based on their high crime and poverty statistics. Durham is a small city with a mostly African-American population. Nashville and Seattle are moderately-sized cities with a mixed ethnicity population consisting of mostly African- and European-Americans. Central Pennsylvania is a rural location with a predominantly European-American population. The ethnic composition of the sample was 35.9% African American, 56.2% European American, and 8% individuals of other ethnicities (e.g., Hispanic, Native American, Asian American).

Procedures

In the spring of first, second and third grade, teachers were individually interviewed regarding the behavior of each child in their class using the Teacher Observation of Classroom Adaptation-Revised (TOCA-R; Werthamer-Larsson, Kellam, & Wheeler, 1991). A research assistant visited each classroom, and during a single interview, teachers completed the TOCA-R rating form (and some others) on all of the students in the class, which required about 90

minutes. Teachers were reimbursed for their time. In the spring of second grade, sociometric assessments were collected, providing a basis for the assessment of social preference and reciprocated friendships with aggressive classmates. Children with parental informed consent in each classroom participated in individual sociometric interviews. Students were read a list of their classmates' names to ensure that the children were familiar with each of their classmates, and then completed ratings and provide nominations.

Measures

Child aggression. Teacher ratings on the Authority Acceptance Scale of the Teacher Observation of Classroom Adaptation—Revised (TOCA-R; Werthamer-Larsson et al., 1991) were used to assess each child's aggressive-disruptive behavior at the end of first and third grades. The Authority Acceptance Scale includes 10 items describing aggressive and oppositional behavior, including “fights,” “breaks rules,” “takes others' property,” and “harms others.” Items are rated on a scale from 0 (*almost never*) to 5 (*almost always*). The TOCA-R has an adequate test-retest reliability (Pearson's correlation coefficient ranging from .75 to .94 two weeks later) and the authority acceptance scale has adequate internally reliability ($\alpha=.95$) (Werthamer-Larsson et al., 1991) and predictive validity (Hill, Coie, Lochman, & Greenberg, 2004; Lochman & Conduct Problems Prevention Research, 1995).

Social Preference. During the individual interviews, children were asked to nominate the classmates who they “liked most” and the classmates who they “liked least” Unlimited nominations were accepted and students could nominate peers of either gender. Social preference was assessed by subtracting the total number of “liked least” nominations received by a child from the total number of “liked most” nominations. The difference score was then divided by the number of children that participated in the sociometric nominations in that

classroom to control for the different number of raters across classrooms. This method is similar to and correlates highly ($r = .95$) with the “social preference” construct created using procedures introduced by Coie, Dodge, and Coppotelli (1982). The modified method was used because it retains between-class differences in sociometric status that are lost during standardization using the Coie, Dodge, and Coppotelli method.

Reciprocated friendships with aggressive classmates. To measure the level of aggression of a child’s reciprocated friendships, it is necessary to first determine who are the child’s reciprocated friends and, second, to determine the level of aggression of those children. Sociometric ratings (as opposed to nominations) were used to determine a child’s reciprocated friendships. During the individual sociometric interviews, children were asked to rate the amount they liked to play with each classmate by pointing to a “likes a lot” face, a “just okay” face, or a “don’t like” face (e.g. “How much do you like to play with [peer’s name]?” and the child responds by pointing). If two children indicated that they liked to play with each other “a lot”, they were considered reciprocated friends. Sociometric ratings were used to identify reciprocated friendships because they were more comprehensive than the sociometric nominations (all children interviewed gave all other children in the classroom a rating), allowing us to match friendship ratings with a greater proportion of the available population. Sociometric ratings also provide distinct items for the assessment of “friends” vs ratings of “social preference,” which used sociometric nominations. Using reciprocated liking ratings to identify reciprocated friendships has a precedent in prior research, where it has shown adequate concurrent and predictive validity (Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). In the present study, there were 1292 children with missing reciprocated friendship data. Children with missing data are missing either because children moved to a classroom that was not included in the study

or because parents did not give consent to participate. Children with missing reciprocated friendship data did not differ significantly in terms of peer nominated aggression. Among non-missing participant data, 100 second grade children had no reciprocated nominations (5 of those children did not give any classmate a high “like to play with” rating, whereas the others identified at least one classmate that they liked to play with but their nominations were not reciprocated).

To determine the degree to which each child’s friend was aggressive, peer nominations of aggression were used. This allowed us to use a different source to assess the aggressiveness of a child’s friend (peer aggression nominations) than was used to assess the aggressiveness of the child or the classroom (teacher ratings) thereby avoiding spurious associations due to same-rater biases. 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 average number of nominations given by each child in the sample ($M = 2.7$) was multiplied by the percentage of children interviewed in each classroom. This number represented the expected number of nominations that each child would receive in an average classroom if all the nominations were evenly distributed throughout the class. The total aggressive nominations that the child actually received was divided by this number to get a ratio of actual nominations received over expected nominations. Thus, a child who received 6 “aggressive” nominations, in a class with a participation rate of 80% would have an actual to expected ratio of 2.8 [6 nominations received / (2.7 nominations given per child in the classroom x .8 of the total children providing

nominations)]. Because only a few children in each class tend to attract the majority of aggressive nominations while most children receive 0 or 1 nominations, the distribution of the ratio of actual/expected nominations is highly skewed. In order to avoid results that were driven by a few outliers, nominations were rescaled in the following fashion. The actual/expected ratio was categorized where 0 = no aggressive nominations, 1 = less than the expected number of nominations (actual/expected ratio less than 1), 2 = from 1-3 time the expected number of nominations (actual/expected ratio from 1 to 3), and 3= greater than 3 times the expected number of nominations (actual/expected ratio greater than 3). The mean of the categorized aggressive nominations of a child's reciprocated friends were used as the measure of exposure to aggressive friends.

Classroom Aggression. In order to represent the average aggression level in each second grade classroom, the mean TOCA-R Authority Acceptance scores given by teachers to students in their classroom were averaged. Because this classroom-level aggression is the same for each child in a given classroom, this variable was entered as a classroom-level variable in the multi-level models that were used in the analysis to account for the nesting of children within classrooms.

Results

Preliminary Analyses

Descriptive analyses (means, standard deviations, ranges) for all variables are presented in Table 1. Correlations that were calculated to describe and summarize the relations among the child's initial and final aggression, 2nd grade peer influences on aggression, and 2nd grade classroom context (Table 2). Children's aggression in first grade was inversely associated with social preference in 2nd grade, $r = -.37, p < .01$, and positively associated with aggressive friendships in 2nd grade, $r = .22, p < .01$. Similarly, both social preference, $r = -.38, p < .01$, and aggressive friendships, $r = .23, p < .01$, in 2nd grade were associated with a child's aggression in 3rd grade. Interestingly, a child's aggression in 1st grade was also associated with classroom aggression in 2nd 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 correlations between social preference, friends' aggression, and classroom aggression were small (all less than $r = .14$), indicating that these potential influences on aggression are relatively independent of one another.

Multi-level models

Multi-level models were used in all following analyses to account for non-independence in the dependent measures that resulted from children being grouped within classrooms. 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 changes as the independent variable increases by 1 standard deviation. For all models, the most appropriate error structure was determined by testing different combinations of random effects on a model that included all

hypothesized effects. The error structure that generated the best fitting model as determined by the AIC and BIC was used to test the models. For all HLMs, sex was dummy coded (Male = 0, Female = 1).

1st Grade Aggression predicting Aggressive Friends in 2nd Grade

Based on the homophily model, it was hypothesized that a child's level of aggression in first grade would predict the degree to which he/she had aggressive friends in second grade. In addition, it was hypothesized that the average level of peer aggression in the second grade classroom would affect the likelihood that children would have aggressive friends, reflecting the density of aggressive children in the potential friendship pool. To test these hypotheses, two multi-level models were run, first without classroom-level aggression in the model, and then with classroom-aggression included to determine whether classroom context affected the relations between child aggression and the aggressiveness of the child's friends.

In the first model, child sex and first grade aggression represented level 1 variables in the model, and second grade classroom represented the level 2 (grouping) variable. The dependent variable was the mean aggressiveness of each child's second grade friends (as measured by peer nominations). As shown in the first column of Table 3, this unconditional HLM revealed that 23.0% of the variance in the mean aggression of a child's friends was accounted for at the classroom-level. As expected, without accounting for context, child aggression in 1st grade was a significant predictor of 2nd grade aggressive friendships, $\beta = .103, p < .01$, supporting the homophily hypothesis. There was also a significant effect for sex, with the overall level of aggressive friendships higher for boys than for girls.

In the second model, to test the hypothesis that the average level of peer aggression in the second grade classroom would affect the likelihood that children would have aggressive friends,

the model was re-run with classroom levels of aggression as a measure of context, shown in the second column of Table 3. The hypothesis that more aggressive classroom contexts would lead to higher rates of aggressive friendships was supported, $\beta = .114, p < .01$. After adding classroom aggression, the main effect of a child's aggression in 1st grade on the development of aggressive friendships in 2nd grade remained significant, $\beta = .100, p < .01$, as did the main effect for gender. These effects indicate that, after controlling for classroom context, being aggressive in first grade continues to increase the risk of forming aggressive friendships in second grade, and boys' friends continue to be more aggressive compared to girls' friends

1st Grade Aggression predicting Social Preference in 2nd Grade

The next set of models examined the relation between first-grade aggression and second grade social preference. It was hypothesized that children who were aggressive in first grade would have a lower social preference and be at elevated risk for peer rejection in second grade. However, following the social norm model, it was also hypothesized that the average level of peer aggression in the second grade classroom would moderate the relationship between child aggressive behavior and social preference, such that aggressive first-grade children would be less disliked when they transitioned into second-grade classrooms containing many aggressive children as compared to aggressive children who transitioned into classrooms containing few aggressive children.

Parallel to the previous analyses, two multi-level models were estimated to test these hypotheses. In the first model, child sex and first grade aggression were included as level 1 variables in the model, and second grade classroom represented the level 2 (grouping) variable. The dependent variable was a child's peer nominated social preference in second grade. As shown in the first column of Table 4, without accounting for context, child aggression in 1st

grade was a significant predictor of 2nd grade social preference, $\beta = -.417, p < .01$. Boys had lower ratings of social preference overall than girls. These results replicated previous findings (Coie & Kupersmidt, 1983; Dodge, 1983; Dodge, Coie, Pettit, & Price, 1990) and support the hypothesis that more aggressive children are less liked and more disliked than less aggressive children. Interestingly, the unconditional HLM results indicate that only 1.1% of the variance in a child's rejection was accounted at the classroom level.

Next, classroom levels of aggression were added to the model, as shown in the second column of Table 4. Again replicating previous findings, aggressive classroom contexts moderated the relationship between 1st grade aggression and social preference in 2nd grade, such that aggressive children received better social preference scores in more aggressive classrooms than in less aggressive classrooms, supporting the social norm hypothesis (Boivin, Dodge, & Coie, 1995; Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). In a classroom with an average level of aggression, for each standard deviation increase in 1st grade aggression, the predicted decrease in a child's social preference in 2nd grade is .44 standard deviations, $p < .01$. In contrast, in a classroom with a level of aggression one standard deviation above the mean, the same change in a child's 1st grade aggression would predict a decrease in his or her social preference of only .35 standard deviations. Conversely, in a classroom with a level of aggression one standard deviation below the mean, a child's social preference would be expected to decrease by .53 standard deviations for each standard deviation increase in 1st grade aggression. The interaction is illustrated in figure 1, with separate lines for levels of classroom aggression at +2 SD and -2 SD. The significant main effect for classroom-level aggression (the difference in social preference when 1st grade aggression = 0 in figure 1) is interpreted in terms of the interaction and does not have meaning in and of itself. After adding class-level aggression to the

model, boys continue to receive more negative and fewer positive nominations than girls overall ($p < .01$).

Low Social Preference predicting Aggressive Friendships

Next, analyses were undertaken to test the “homophily by exclusion” hypothesis that low social preference leads to an increase in aggressive friendships, after controlling for initial levels of child aggression (Table 5). Child sex, 1st grade aggression, and 2nd grade social preference were included as level 1 variables in the HLM, and second grade classroom represented the level 2 (grouping) variable. The “homophily by exclusion” hypothesis was not supported, as no significant relation emerged between second grade social preference and second grade aggressive friendships, when controlling for the level of the child’s first grade aggression, $\beta = -.036$, $p > .10$. With social preference in the model, 1st grade aggression remains a significant predictor of 2nd grade aggressive friendships, $\beta = .088$, $p < .01$. These results indicate that individuals tend to have friends with similar levels of aggression as themselves not because aggressive children are rejected from the mainstream peer group, but rather because of other reasons such as choice (as predicted by the “homophily by selection” model). The HLM was rerun with the addition of classroom aggression, and the results are the same: social preference does not predict aggressive friendships, $\beta = -.040$, $p > .10$ (Table 5, 2nd column).

Aggressive Friendships in 2nd Grade predicting 3rd Grade Aggression

Next, hypotheses based on the “peer contagion” model were tested to determine if having aggressive friends in 2nd grade leads to an increase a child’s aggression in 3rd grade, controlling for his or her 1st grade levels of aggression (Table 6). Child sex, 1st grade aggression, and the mean aggression of a child’s 2nd grade friends were included as level 1 variables, and the combination of 2nd and 3rd grade classroom was used as the level 2 (grouping) variable (each 2nd-

grade-3rd-grade classroom combination was considered to be a unique group for purposes of nesting). A combination of a child's 2nd and 3rd grade classroom was used as the grouping variable to account for non-independence due to classroom level influences in 2nd grade (mean classroom aggression) and non-independence due to 3rd grade classroom influences and same-rater variance. The mean number of children in each 2nd-grade-3rd-grade classroom unit was 4.9 ($SD = 4.1$). This unconditional HLM indicates that 19.3% of the variance in children's 3rd grade aggression is at the level of the 2nd-grade-3rd-grade classroom unit.

Aggressive friendships were a significant predictor of 3rd grade aggression, $\beta = .094, p < .01$, supporting the hypothesis that a friendship milieu in which aggression is common increases a child's own aggressive behavior as predicted by the peer contagion model. A second model was run, adding classroom levels of aggression (table 6, 2nd column) as a level 2 predictor. There was a small but significant main effect for classroom aggression, $\beta = .053, p < .05$. With the addition of classroom context, the effect of aggressive friendships did not change by a significant amount, $\beta = .088, p < .01$. This suggests that, while an aggressive classroom context makes it more likely that a child will have aggressive friendships, having aggressive friends and being in an aggressive classroom each uniquely predicts later aggression.

Peer Rejection in 2nd Grade predicting 3rd Grade Aggression

Another HLM was estimated to test the hypothesis that a child's social preference in 2nd grade would predict their 3rd grade aggression, controlling for 1st grade aggression and gender. Child sex, 1st grade aggression, and 2nd grade social preference were included as level 1 variables, and the combination of 2nd and 3rd grade classroom was used as the level 2 (grouping) variable (Table 7, 1st column). As hypothesized, 2nd grade social preference was a significant predictor of 3rd grade aggression, $\beta = -.168, p < .01$ indicating that greater exposure to peer

censure (low social preference) increased a child's propensity to act aggressively, even a full year later when in a new environment. A second model was run, adding classroom levels of aggression to the previous model (Table 7, 2nd column). Controlling for gender and a child's aggression in 1st grade, and included with social preference, there was a small, significant main effect of classroom aggression, $\beta = .070, p < .01$. The effect of social preference on aggression did not change when classroom levels of aggression were added to the model, $\beta = -.168, p < .01$. These results suggest that low social preference and being in an aggressive classroom each uniquely predicts later aggression.

Concurrent 2nd Grade Peer Influence predicting 3rd Grade Aggression

Another question that this study aimed to address involved the concurrent influence of social preference and aggressive friendships on the development of aggression. To test whether each form of peer influence explained unique variance in 3rd grade aggression, an HLM including sex, 1st grade aggression, 2nd grade social preference, and 2nd grade friends' aggression as level 1 variables, and the combination of 2nd and 3rd grade classroom as the level 2 (grouping) variable was tested. When tested concurrently, without accounting for context, both predictors were significant (Table 8, 1st column). When the regression coefficients from the models with independent and concurrent predictors were compared, the coefficients did not change much, indicating that these effects were largely independent of one another. The regression coefficient for social preference was $-.159 (p < .01)$ when aggressive friendships were included in the model, compared with $-.168 (p < .01)$ when included individually. The regression coefficient for aggressive friendship was $.097 (p < .01)$ in the concurrent prediction model and $.094 (p < .01)$ when modeled independently from social preference. This gives further evidence that social

preference and aggressive friendships represent important independent pathways contributing to the development of later aggression.

Direct vs Indirect Influence of Aggressive Classroom Context

Finally, we sought to test whether the more proximal measures of peer influence (peer rejection and aggressive friendships) account for the impact that classroom aggression has on later aggression, or whether classroom aggression is a third type of peer influence with unique predictive ability. This analysis addressed the question of whether, after accounting for the impact of social preference and aggressive friendships, both of which are influenced by the level of aggression in the classroom, classroom levels of aggression continue to predict later aggression. To test this hypothesis, 2nd grade classroom aggression was added to the previous model as a level-2 predictor (Table 8, 2nd column). When classroom aggression was entered, all three peer and contextual influences were significant predictors of 3rd grade aggression (social preference: $\beta = -.162, p < .01$; Friends' Aggression: $\beta = .090, p < .01$; Classroom Aggression: $\beta = .061, p < .01$), indicating three distinct peer and contextual influences on later aggression, controlling for initial levels of aggression and gender.

The concurrent influence of aggressive friends and social preference and how those influences are affected by classroom levels of aggression are summarized in figure 2, which shows the significant effects determined from the multilevel models. To test whether or not this model adequately accounts for the relationships in the data, a traditional path analysis, which disregards the nested data structure, was conducted using MPLUS. Exogenous variables, including gender (which is not shown in figure 2) were allowed to correlate. The path analyses indicates that these paths are sufficient to account of the correlations among the variables, $\chi^2 = 2.60, df = 3, p > .20$.

Discussion

Peer Influences on Aggression

There is growing evidence that two peer processes, aggressive friendships and peer rejection, may be influential in maintaining or increasing aggressive behavior in the early elementary years. The homophily model, which is usually studied during adolescence but which several recent studies suggest is applicable during the early elementary years, suggests that aggressive children develop an aggressive friendship cohort, and that a child's friends' are influential in the later development of aggressive behaviors (Cairns, 1979; Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Farmer & Hollowell, 1994; Snyder, et al., 2005).

Aggressive behavior in middle childhood has also been linked to low levels of peer preference, as mainstream peers tend to not like children who behave aggressively (Coie & Kupersmidt, 1983; Dodge, 1983; Dodge, Coie, Pettit, & Price, 1990). Low levels of social preference resulting from aggressive behavior, in turn, have been linked to increases in aggressive behavior beyond that predicted by a child's initial levels of aggression (Bierman, Smoot, & Aumiller, 1993; Bierman & Wargo, 1995; Coie et al., 1992; Dodge et al., 2003; Miller-Johnson et al., 2002).

Prior to this study, it was unclear whether low social preference and having aggressive friends were two distinct pathways to later aggression or whether they are intertwined. For example, some developmental researchers have hypothesized that peer rejection leads aggressive child to develop aggressive friends, indicating a single pathway (Coie, 1990), whereas others have proposed that aggressive children affiliate by choice, indicating multiple pathways (Cairns, Neckerman, & Cairns, 1989). While several studies have examined the effects of aggressive friendships and peer rejection separately, only two previous studies have addressed both

processes at the same time (Laird et al, 2001; Werner & Crick, 2004,) and this is the first study to examine the interactions of these processes during this developmental period. The present study answers several important questions regarding the interplay of these two types of peer influence, and indicates that during early elementary school, social preference and aggressive friends each have unique predictive power for later aggression. Further, the present study indicates that low social preference and aggressive friendships are independent and non-overlapping influences.

Aggressive Friends. A line of research that originated with adolescent populations indicates that deviant friends exert an influence on an adolescents' behavior. These studies generally conclude that, while deviant adolescents remain rejected by the mainstream peer group, larger peer networks and greater amounts of time spent in unsupervised interactions allow deviant peers to interact and form their own peer cliques through the process of homophily (Dishion, Andrews, & Crosby, 1995). Within delinquent peer groups, deviant adolescents reinforce antisocial behavior and serve as models for social learning of deviant acts (Dishion et al., 1996; Patterson, Reid, & Dishion, 1998; Dishion, McCord, & Poulin, 1999). Many of the delinquent behaviors that occur in groups, such as substance use, truancy, and shoplifting have very low base rates until adolescence, when youth have greater mobility and are less well-supervised by adults than in middle childhood. Hence, it was assumed that peer support for these deviant activities was not a large influence until adolescence.

Although children in early elementary school do not engage in group delinquency in the same way as aggressive adolescents, there is growing evidence that peer contagion may still occur at this age in a way that encourages and reinforces aggressive and rule-breaking behavior. Snyder and colleagues (2005) indicate that deviant peer influence at this age consists of talk about and positive responding to sneaky behavior (such as lying, stealing, and cheating), defying

authority, aggression and swearing, sex, and gross and inappropriate subjects like bodily functions. They have shown that engaging in talk about, or responding positively to, these subjects predicts an increase in covert and overt conduct problems across the kindergarten year in the same manner as predicted by models of deviancy training during adolescence.

As predicted by the homophily model, and supporting a growing body of research, the present study finds that children tend to befriend other children with similar levels of aggression (Path A₁ in figure 2). As predicted by the peer contagion model, having more aggressive friends predicts greater levels of aggression at later intervals, even after controlling for a child's initial level of aggression (Path A₂ in figure 2). Taken together, Path A₁ and A₂ suggest a developmental feedback loop, where higher levels of aggression in first grade predict friendships with more aggressive peers in second grade. These two processes create a self-reinforcing feedback loop that maintains and reinforces initial levels of aggressive (or non-aggressive) behavior. From a developmental perspective, the child's behavior during early schooling is shaping his or her social environment, which in turn serves to constrain the experiences and opportunities available to the child, ultimately shaping the child's later behavior.

In comparing the strength of these associations, the "peer contagion" influence on aggression at this age ($\beta = .09$) is small, but consistent with other studies that have examined the influence of aggressive friends on a child's aggression in early elementary school (Werner and Crick, 2004). It is important to note that, in this study, the impact of having aggressive friends in second grade was not assessed until the end of third grade, when children had already experienced a year's exposure to 3rd grade peer and classroom influences. By measuring the outcome in third grade, this study provides a very conservative estimate of the impact of aggressive friends and classmates, as it examines the lasting impact of those relationships a year

later. Viewed from this perspective, it is quite notable that aggressive peers have such a lasting influence on a child's aggression that persists for so long in the presence of other contexts. A child's aggressive friends appear to alter the child's developmental course to a degree that the change was detectable almost a full year later in a new classroom, with a new teacher, and with a partially unique peer group. Thus, the 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.

Peer Rejection. The dominant theoretical perspective in the literature suggests that as aggressive children enter the school environment, they are rejected by mainstream peers who dislike their aggressive behavior (Bierman, 2004; Coie, 1990; Patterson, Capaldi, & Bank, 1991). Isolated by and alienated from the mainstream peer group, aggressive children are left with restricted options for companionship, resulting in an impoverished and harsh social environment. Hence, they have few opportunities to learn alternative prosocial behaviors that might curb their aggressive tendencies, and they experience higher levels of peer rebuff and ill-treatment, serving to maintain and exacerbate their aggressive behaviors (Coie, 1990). Consistent with this developmental model, and replicating previous studies of the association of aggression and peer rejection, the present study supports the conclusions that (1) child aggression in grade 1 predicts low social preference (a combination of low peer liking and high disliking) a year later (Path B₁ in figure 2), and (2) low social preference in grade 2 predicts later aggression in grade 3, controlling for a child's initial levels of aggression (Path B₂ in figure 2).

As with the impact of aggressive friends, when considered together, paths B₁ and B₂ indicate a developmental feedback cycle that maintains and exacerbates initial levels of aggression across multiple years and contexts. In this case, a child's initial level of aggression

shapes the way his or her peers evaluate and respond to him or her. Those children who are more aggressive experience fewer positive and less skillful social interactions, whereas those children who are less aggressive are well liked and have more options to interact and become socially skillful, widening the gap between the social “haves” and “have nots.”

Concurrent Peer Influences. This study also addressed questions about the degree to which aggressive friendships and peer rejection represent overlapping or independent influences on the growth of child aggression. Developmental theorists have posed different models of action to account for the increased association of aggressive children with aggressive friends. One model suggests that aggressive children may simply prefer to be around other children who are similar to themselves and affiliate by choice (selection by attraction; Cairns et al., 1988), which suggests that having aggressive friends is independent of peer rejection. A competing model suggests that aggressive children are rejected by less aggressive, more socially skillful children and merely affiliate with those peers who are still accessible to them (selection by exclusion; Coie, 1990). This theory suggests that a single path exists, from aggression to rejection and from rejection to having aggressive friends. The present study finds support for two distinct developmental pathways, one through low social preference and one through aggressive friendships, supporting the selection by attraction hypothesis. After controlling for initial levels of aggression, there was no association between social preference and aggressive friends indicating that aggressive children are not befriending each other because of low social preference.

When comparing the relative influence on a child’s aggression of having aggressive friends versus receiving low social preference nominations, the influence of low social preference appears stronger. This is consistent with the dominant developmental theory that, at

school entry, peer rejection is the most influential peer influence that maintains and aggravates aggressive behavior. However, low social preference cannot account for the association between a child's aggression and aggressive friendships, and aggressive friendships have a unique predictive power for later aggression after controlling for prior aggression and social preference. This study joins a growing body of work that indicates that the processes of homophily and peer contagion are important influences on the development of aggression that are occurring at younger ages than previously recognized (Estell, Cairns, Farmer, & Cairns, 2002; Farver, 1996; Hanish, Martin, Fabes, Leonard, & Herzog, 2005; Snyder, 1997; Snyder et al., 2005).

Aggressive Classroom Context

The second major aim of the present study was to address several important questions about the role of normative levels of aggression in the classroom on processes of peer influence associated with aggressive child behavior. The study addressed the impact of the average or normative level of aggression in each classroom on the dual peer influences of having aggressive friends and being rejected by peers. It also addressed whether or not classroom levels of aggression constitute a direct, additional influence on aggressive behavior, or whether classroom levels of aggression act indirectly by modifying the influence of the proximal peer processes.

Classroom Context and Aggressive Friends. As predicted, children who were placed in second grade classrooms that contained more aggressive peers were more likely to have aggressive friends than children placed in less aggressive classrooms (Path C₂ in figure 2). Since children tend to befriend peers who are similar to themselves in various domains, including but not limited to aggression (Haselager, et al., 1998), being in an environment with a greater concentration of aggressive children may increase the probability that children will befriend

more aggressive children based on similarities along other characteristics, with the end result of having more aggressive friends than in non-aggressive classroom environments.

Classroom Context and Social Preference. As predicted based on social norms models, the relationship between aggression and social preference is moderated by context, such that in more aggressive classrooms aggression becomes a less socially toxic behavior (Path C_1 in figure 2; Boivin, Dodge, & Coie, 1995; Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). However, even in the most aggressive classrooms, aggressive behavior was still, on average, associated with decreased social preference – just not as strongly as in less aggressive classrooms. Thus, while aggressive children may be less disliked in the most aggressive classrooms than they would be if placed in less aggressive classrooms, these environments cannot be considered to be “protective” in any way. This is especially true when considering that being in an aggressive classroom environment predicts later aggression, due both to a direct impact on later aggression, and due also to an indirect influence, by increasing the likelihood that children will have aggressive friends.

Direct Influence of Classroom Context. There are several reasons why being placed in an aggressive classroom might increase a child’s aggression. First, the prevalence of aggressive youth in any social group (including classroom groups) affects social norms. Due to its increased prevalence, aggressive behavior may be viewed as more normative, and hence more acceptable. Henry and colleagues (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. In addition, 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. Synder and colleagues (2005) found that deviancy training among children in kindergarten was not confined to dyadic friendships, but occurred between semi-randomly paired classmates, indicating that greater levels of deviancy training are likely to occur in classrooms with greater numbers of aggressive children. The decreased association between an individual's aggression and low social status in more aggressive classroom environments (e.g. Stormshak, et. al. 1999) also indicates that the degree to which peers enforce social sanctions against aggression decreases as the behavior become more normative, reducing pressure to limit the use of aggressive strategies. Finally, greater numbers of children may also make classrooms more difficult to manage, leading teachers to rely on less effective reactive and punitive management strategies (Brophy, 1996). Teachers' coercive discipline practices may serve to train further aggressive and defiant behavior similar to Patterson's (1982) coercive parenting model. Indeed, empirical studies have linked punitive, reactive classroom management strategies to increased, rather than decreased discipline problems (Hamre & Pianta, 2001; Hughes, Cavell, & Jackson, 1999; Thomas, Becker, & Armstrong, 1968).

The present study adds to the literature by beginning to "unpack" the levels of influence of an aggressive classroom context. Support was found for both direct and indirect influences of classroom context on aggression. As described earlier, classroom context had an indirect effect by influencing the aggressiveness of a child's friends (path C_2 in figure 2) and by moderating the relationship between initial levels of aggression and social preference (path C_1 in figure 2). HLM analyses indicated that in addition to these indirect effects, classroom context has a direct effect on later aggression after controlling for initial levels of aggression, friends' aggression, and social preference (path C_3 in figure 2).

Additionally, this study extends the literature on the effect of classroom context by showing that aggressive classroom contexts have an impact on aggression that is discernable a year later. Most prior studies that have examined the effect of aggressive classroom contexts examined the impact on the child during the same year. That methodology is limited in two ways. First, it is possible that the child adapts his or her behavior in response to his or her current environment, but that exposure to that environment has no lasting impact on development. Second, in many of these studies, the same rater is used to measure the individual's aggressive behavior and the peer levels of aggressive behavior that define the classroom context, leaving open the possibility that the effects are due to same-rater shared variance, rather than an actual effect. The present study finds a lasting impact of 2nd grade aggressive classroom contexts on a child's aggression measured a year later in a different context and by a separate rater.

The impact of an aggressive classroom a year later is small. However, a recent study using the same sample population indicates that 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 (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 an entire population may be larger than the small effect size would typically indicate.

Limitations and Future Directions

The primary methodological limitation of this study is that, due to practical and ethical considerations, this is a non-experimental study. As such, the data are correlational in nature and

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 be causing the observed correlations.

Another methodological limitation is that a single indicator was used to measure each construct. Except for friends' aggression and social preference (where multiple raters and different items were used), different raters were used for each variable to avoid the possibility of inflating correlations due to shared-rater method variance. However, because a single indicator was used to define each construct, it is likely that the associations between these constructs were underestimated due to uncorrelated measurement error. The range of between-class differences were also likely underestimated due to children's, and to a lesser degree teachers', limited exposure to other classroom contexts. Because of these limitations, the true associations between individual aggression, peer influences and classroom aggression are likely greater than the calculated values.

Because of the already complex interactions of context and peer influences, the relative lack of studies that have examined these interactions, and the resulting lack of strong theory to guide the empirical analyses, broad measures of aggression and a population based (dimensional) approach were employed in this study. While the dimensional approach increases power and appears to accurately reflect the pattern of associations, it also makes the implicit assumption that the processes that are occurring at the opposite extremes of the various dimensions are the same. These results may be likened to an omnibus test in an ANOVA. The present study indicates that a main effect was found, but the next question to ask is for which children, in what environments, and for which subtypes of aggression are these peer influences important? However, as the number of variables examined increases, the number of potential interactions

increases geometrically leading to an increased risk of alpha inflation. Thus, a stronger theoretical framework is needed in order to proceed most efficiently.

Along the same lines, although there is some evidence that there are gender differences in peer influences on aggression (e.g. Werner and Crick, 2004), this study was not designed specifically to examine how peer influence on aggression may differ for boys and girls. The measures of aggression that were used were not designed to examine the subtypes of aggression that may be most appropriate for examining gender differences (specifically, physical vs. relational aggression). Both the peer nominations measure of aggression (“Some kids start fights, say mean things, and hit other kids.”) and the TOCA-R (e.g. “fights” and “harms others” vs “teases others” and “lies”) capture both physical and to a lesser degree verbal aggression, but neither instrument was designed to measure relational aggression per se.

Implications for Intervention

The present study has important implications for interventions that aim to reduce aggressive behavior in early childhood. These results indicate that peers exert important influences on the socialization of aggressive behavior. Interventions that hope to shape the developmental course of aggression should address the increasing deficits in social skills of aggressive children, which result from low social preference among mainstream peers, and a corresponding lack of access to an enriched social environment. It may also be important for interventions to increase efforts to create and nurture new friendships with non-aggressive peers, and structure groups to prevent access to other aggressive children, in the hopes of reducing the influence of more aggressive friends.

The present study also indicates that efforts should be made to reduce the mean rate of aggression in classrooms, which appears to have direct, harmful consequences, above and

beyond the indirect effects on proximal peer indicators. 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 only for the more aggressive children, classroom context affects all of the children in a classroom, regardless of their initial levels of aggression. As such, continued efforts to affect classroom climate and help teachers to better manage their classrooms appear to be warranted.

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Appendix: Tables and Figures

Table 1

Descriptive Statistics of Predictor and Dependent Variables

Variables	Mean (SD)	Range
Child's Aggression, 1 st grade	1.02 (1.05)	0 to 5
Child's Aggression, 3 rd grade	1.05 (.99)	0 to 4.9
Social Preference	.11 (.26)	-.88 to .88
Friends' Aggression	.83 (.62)	0 to 3.0
Classroom Aggression	1.07 (.45)	0 to 2.2

Table 2

Correlations among Measures of Peer Influence on Aggression and Classroom Context

	(1)	(2)	(3)	(4)	(5)
(1) Child's Aggression, 1 st grade	--	0.59**	-0.37**	0.22**	0.24**
(2) Child's Aggression, 3 rd grade		--	-0.38**	0.23**	0.21**
(3) Social Preference			--	-0.14**	-0.00
(4) Friends' Aggression				--	0.12**
(5) Classroom Aggression					--

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

Table 3

Hierarchical Linear Models Predicting Friends' Mean Peer-rated Aggression in 2nd Grade

	Standardized Coefficients	
	w/o Context	w/Context
Intercept	.444 (.042)	.447(.041)
<u>Level 1: Child Characteristics</u>		
Sex	-.834(.034)	-.837 (.034)**
Child Aggression, Spring 1 st grade	.103(.023)**	.100 (.023)**
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.114 (.035)**
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.238 (.033)**	
χ^2 (df)	350.32 (1) **	
r: Individual-level variance	.795(.022)**	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.209 (.030)**	.195 (.0284)**
μ_{22} : Variance of Group Slopes	.018 (.010)*	.019(.011)**
χ^2 (df)	304.38(3)**	291.31(3)**
r: Individual-level variance(SD)	.588(.02)**	.590 (.019)**

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

Table 4

Hierarchical Linear Models Predicting Peer Rejection in 2nd Grade

	Standardized Coefficients	
	w/o Context	w/ Context
Intercept	-.149 (.029)	-.163 (.029)
<u>Level 1: Child Characteristics</u>		
Sex	.300(.033)**	.295 (.033)**
Child Aggression, Spring 1 st grade	-.417(.022)**	-.441(.022)**
Interaction : Child Aggression X Classroom Aggression	--	.085(.021)**
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.088(.024)**
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.011 (.006)*	
χ^2 (df)	4.63 (1) *	
r: Individual-level variance	.989(.023)**	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.048 (.011)**	.046(.011)**
μ_{22} : Variance of Group Slopes	.024 (.009)**	.015(.008)*
χ^2 (df)	52.33(3)**	47.03(3)**
r: Individual-level variance(SD)	.773(.02)**	.772(.02)**

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

Figure 1. Interaction of child's aggression in 1st grade and mean classroom aggression in 2nd grade in predicting 2nd grade social preference.

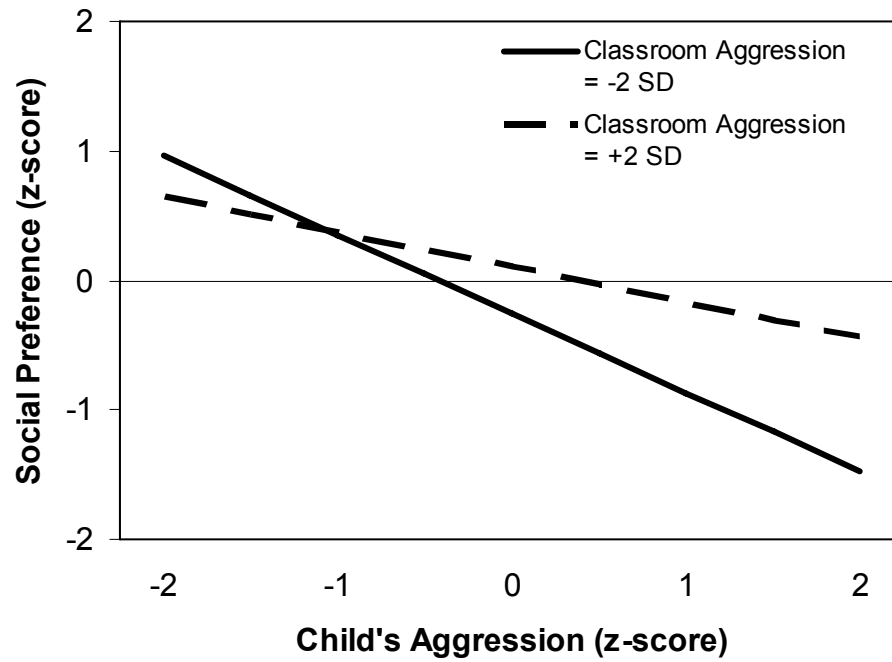


Table 5

Hierarchical Linear Models Predicting Aggressive Friendships in 2nd grade from Social Preference in 2nd grade.

	Standardized Coefficients	
	w/o Context	w/ Context
Intercept	.433(.042)	.433(.041)
<u>Level 1: Child Characteristics</u>		
Sex	-.803 (.034)**	-.805 (.034)**
Child Aggression, Spring 1 st grade	.088 (.021)**	.081 (.021)**
Social Preference, 2 nd grade	-.036 (.028)	-.040 (.029)
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.117 (.036)**
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.238 (.033)**	
χ^2 (df)	350.32 (1) **	
r: Individual-level variance	.795(.022)**	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.209 (.030)**	.195 (.058)**
μ_{22} : Variance of Group Slopes, Aggression	.068(.014)**	.067(.014)**
χ^2 (df)	362.75 (3)**	352.49 (3)**
r: Individual-level variance(SD)	.545 (.018)**	.542 (.018)**

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

Table 6

Hierarchical Linear Models Predicting Aggression in 3rd Grade from Friends' mean aggression in 2nd grade.

	Standardized Coefficients	
	w/o Context	
Intercept	.063(.031)	.065(.031)
<u>Level 1: Child Characteristics</u>		
Sex	-.114(.037)**	-.122(.037)**
Child Aggression, Spring 1 st grade	.596(.025)**	.586(.025)**
Friends' Aggression, 2 nd grade	.094(.025)**	.088(.025)**
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.053 (.022)*
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.193(.020)**	
χ^2 (df)	297.63(1)**	
r: Individual-level variance	.809(.020)	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.143(.020)**	.139(.020)**
μ_{22} : Variance of Group Slopes, Aggression	.069(.016)**	.066(.016)**
μ_{33} : Variance of Group Slopes, Social Preference	.066(.016)**	.065(.016)**
χ^2 (df)	235.38(6)**	224.24(6)**
r: Individual-level variance(SD)	.361(.016)**	.361(.016)**

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

Table 7

Hierarchical Linear Models Predicting Aggression in 3rd Grade from Social Preference in 2nd grade.

	Standardized Coefficients	
	w/o Context	w/ Context
Intercept	.114(.027)	.109(.027)
<u>Level 1: Child Characteristics</u>		
Sex	-.188(.028)**	-.191(.029)**
Child Aggression, Spring 1 st grade	.520(.022)**	.509 (.022)**
Social Preference, 2 nd grade	-.168(.016)**	-.168 (.016)**
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.070 (.021)**
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.193(.020)**	
χ^2 (df)	297.63(1)**	
r: Individual-level variance	.809(.020)	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.151 (.018)**	.146 (.017)**
μ_{22} : Variance of Group Slopes,	.048(.012)**	.047(.012)**
Aggression		
χ^2 (df)	293.06(3)**	266.08 (3)
r: Individual-level variance(SD)	.402(.014)**	.402 (.014)**

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

Table 8

Hierarchical Linear Models Predicting Aggression in 3rd Grade from Peer Rejection and Deviant Friendships

	Standardized Coefficients	
	w/o Context	w/ Context
Intercept	.052(.030)	.056(.030)
<u>Level 1: Child Characteristics</u>		
Sex	-.074(.036)*	-.083(.036)*
Child Aggression, Spring 1 st grade	.532(.026)**	.520(.026)**
Social Preference, 2 nd grade	-.159(.019)**	-.162(.019)**
Friends' Aggression, 2 nd grade	.097(.025)**	.090(.025)**
<u>Level 2: Classroom Characteristics</u>		
Classroom Aggression	--	.061(.023)**
<u>Random effects for unconditional model</u>		
μ : Group-level variance	.193(.020)**	
χ^2 (df)	297.63(1)**	
r: Individual-level variance	.809(.020)	
<u>Random effects for conditional model</u>		
μ_{11} : Variance of Group Intercepts	.138(.019)**	.132(.019)**
μ_{22} : Variance of Group Slopes, Aggression	.066(.015)**	.064(.015)**
μ_{33} : Variance of Group Slopes, Friends' Aggression	.067(.016)**	.067(.016)**
χ^2 (df)	237.91(6)**	226.39(6)**
r: Individual-level variance(SD)	.344(.016)**	.345(.016)**

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

Figure 2. Summary of HLM results.

