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ORIGINAL ARTICLE

Aggression Norms in the Classroom Social Network: Contexts of Aggressive Behavior and Social Preference in Middle Childhood

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Abstract In a cross-sectional sample of African-American 2nd–4th grade students ($N = 681$), we examine the moderating effects of classroom overt and relational aggression norms on peers' social acceptance of classmates who exhibit overt and relational aggression in urban schools. Extending theory and research on classroom norms, we integrate social network data to adjust aggression norms based on children's direct and indirect connections in the classroom. Results of multilevel models indicate that network-based classroom aggression norms moderated relations between children's aggressive behavior and their social preference. Specifically, children benefited socially when their form of aggressive behavior fit with what was normative in the classroom social context. The moderating effect of classroom aggression norms was stronger for the association between overt aggression and social preference than relational aggression and social preference. Relationally aggressive youth were socially preferred by peers regardless of the classroom norm, although this positive association was magnified in classrooms with higher levels of relational aggression. Future research focused on aggression norms within classroom social networks are discussed and implications for school prevention efforts are considered.

Keywords Aggression norms · Middle childhood · Social networks · Classroom contexts · Social preference

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Introduction

Peers become increasingly important in middle childhood and early adolescence. Myriad studies across disciplines have examined factors contributing to children's acceptance and rejection among peers. Much of this work has focused on the behavioral correlates of peer likeability (commonly referred to as "social preference") and rejection. Although prosocial and cooperative behaviors are consistently and positively linked with social preference (Lease et al. 2002; Torrente et al. 2014), research on the links between aggressive behavior and social preference is mixed (Sentse et al. 2007). Whereas some studies suggest that aggressive children are less socially preferred by peers, other work has found that aggressive children are more socially preferred by peers (see Farmer and Xie 2007).

One reason for the inconsistent findings may be the specific form of aggression studied: overt aggression (i.e., direct and visible physical or verbal aggression) or relational aggression (i.e., subtle or indirect manipulation of social relationships or status; Crick and Grotpeter 1995). Existing research suggests the forms of aggression may be differentially related to indicators of individual students' social acceptance in the peer context (e.g., Heilbron and Prinstein 2008). Another possible explanation for mixed findings may pertain to the social norms within the classroom peer context in which the aggressive interactions

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occur. Guided by social ecological models of peer aggression (Olweus 1994; Swearer et al. 2010), research demonstrates that the acceptance or rejection of aggressive children varies based on whether aggressive behavior is frequently displayed—or normative—across the classroom (Garandeau et al. 2011) or among high status peers (Dijkstra et al. 2008).

Findings from these bodies of work suggest that children are likely to behave consistently with the descriptive norms of the classroom or popular peers. However, the research has relied on a fairly one-dimensional conceptualization of aggression norms—average frequency of aggressive behavior across the classroom or within a smaller group of high status children. However, some have questioned the assumption that average behavior best reflects the norms of a setting (Seidman 2012). Recent work has highlighted the importance of understanding social networks for characterizing settings (Neal and Christens 2014; Tseng and Seidman 2007). Social network theory suggests norms are communicated within a broader structure of interpersonal relationships that facilitates or hinders peer influence processes (Wellman 1988).

Thus, to extend current understanding of classroom normative processes, this study integrates social network methods into traditional empirical approaches to studying norms. Drawing on a sample of urban-residing second, third, and fourth graders, we propose a new way of assessing classroom aggression norms, and explore whether network-based overt or relational aggression norms moderate relations between children's overt or relational aggression and their social preference. Below, empirical work on social preference and peer aggression—both overt and relational forms—is reviewed, alongside current literature on the role of classroom and popular peer aggression norms in children's aggression and social preference in middle childhood.

Social Preference and Aggression: Overt and Relational Forms

Typically assessed using peer nominations of 'like most' and 'like least,' social preference measures how well-liked a child is among his/her peers (Coie and Dodge 1983). Being liked—and not disliked—matters in middle childhood. Peer rejection is linked with concurrent and long-term maladjustments, including academic difficulties (Vandell and Hembree 1994), poor classroom involvement (Ladd et al. 1997), early school dropout (Hymel et al. 1996), and internalizing symptoms (Hartup 1996). Peer acceptance predicts academic and social competence within and across time (see Gifford-Smith and Brownell 2003). Given these correlates and consequences, researchers have worked to identify the social behaviors that predict social preference (Mayeux and Cillessen 2008).

One construct that has received significant attention is peer aggression (i.e., behaviors intended to harm someone physically, socially, or psychologically; Berkowitz 1993). Some studies suggest a negative association between aggression and social preference. In samples that vary in ethnic composition and residence (urban, suburban), Crick and Grotpeter (1995) and LaFontana and Cillessen (2002) found negative associations between social status and peer aggression. However, other studies have shown no associations (Phillipsen et al. 1999) or positive associations (Salmivalli et al. 2000). For instance, in a sample of inner-city African-American elementary school children, a subset of children was both well-liked and highly aggressive (Estell et al. 2002).

Inconsistent findings have led researchers to challenge traditional conceptualizations of aggressive children as a homogeneous group and aggression as a uniform set of behaviors. Aggression encompasses a range of physical and nonphysical behaviors. Overt aggression (i.e., direct physical or verbal hostility) has traditionally been viewed as related to poor psychosocial and academic functioning (Rose et al. 2004). Some studies indicate overtly aggressive children display few prosocial behaviors, exhibit poor emotion regulation, and experience social and academic maladjustment (Barnow et al. 2005; Bierman 2004; Kokko et al. 2006). However, not all overtly aggressive youth experience adjustment problems. When aggressive children are seen as possessing positive qualities (e.g., athleticism, humor, or helpfulness), the negative association between aggression and social preference lessens (Hawley 2003; Vaillancourt and Hymel 2006).

In the last two decades, increasing attention has been paid to relational forms of aggression (Crick and Grotpeter 1995). Relational aggression, which involves the manipulation of social relationships or status, has been linked with externalizing behavior problems (Tackett and Ostrov 2010) as well as peer rejection (Murray-Close and Crick 2006; Werner and Crick 2004; Zimmer-Gembeck et al. 2007). Yet, children who are relationally aggressive may avoid some of the negative consequences typically associated with overt aggression (Calvete and Orue 2011). Some research suggests that subgroups of relationally aggressive youth are seen as popular and influential (Andreou 2006; Cillessen and Mayeux 2004). Other research reports positive relations between relational aggression and social preference (Prinstein and Cillessen 2003) or social intimacy with friends (Grotpeter and Crick 1996).

Although some aggressive youth engage in both types of aggression, many engage primarily in one or the other (Smith et al. 2009). Failure to account for the alternate type in empirical investigations may help to explain some of the discrepancies in findings. For example, in a sample of mainly Caucasian, low-to-middle income elementary school

students, Smith et al. (2009) found that overt aggression was significantly related to lower peer acceptance, regardless of whether relational aggression was included in analysis, highlighting the unique and damaging effect of overt aggression on social acceptance. Relational aggression, however, was only significantly related to lower peer acceptance when overt aggression was *not* considered in analysis. In other words, relational aggression may have fewer or no negative social consequences in the absence of overt aggression (Smith et al. 2009). Together, these studies highlight the need for investigation of both forms of aggression when studying peer aggression and social acceptance (Cillessen and Mayeux 2004; Leadbeater et al. 2006).

Another possible explanation for discrepant findings is that contextual characteristics, such as classroom norms, have been largely unstudied with respect to the different forms of aggression (Kuppens et al. 2008). Social-contextual theories suggest individuals' behavior may be reinforced when that behavior is highly prevalent in a context, whereas that same behavior may be inhibited in contexts where such behavior is rare (Cialdini et al. 1990; Tseng and Seidman 2007). As such, children's engagement in overt or relational aggression may differ as a function of the norm for the specific form of aggressive behavior. However, much of the extant work has either ignored the normative social context in which children display aggression or failed to distinguish between types of aggression when assessing classroom norms.

Classroom Aggression Norms

Peer norms can be powerful regulators of children's behavior (Prentice 2008). Two types of peer norms have been largely studied in classrooms: Descriptive norms (i.e., extent to which a behavior is displayed; Henry et al. 2000) and injunctive norms (i.e., beliefs or attitudes about a behavior; Cialdini et al. 1990). The mechanism of influence associated with descriptive norms derives in part from Tversky's (1977) social norms theory, which posits that the acceptability of a behavior is influenced by the prevalence of that behavior within a group. In an elementary school classroom, social behavior may be more readily and reliably observed than beliefs and attitudes; thus, the focus is on descriptive norms in the current study.

Norms theories, such as the person-group dissimilarity model (Wright et al. 1986) and social context theory (Chang 2004), posit that non-normative social behaviors lead to negative peer evaluations and normative behaviors lead to positive peer evaluations. Specifically, classrooms with high levels of aggression may create a social environment that normalizes aggressive behavior, making the behavior and children who exhibit it more socially acceptable while also decreasing social pressure to inhibit aggression. Empirical

studies concur. In a study of aggression among low-income, ethnic minority first graders, Stormshak et al. (1999) found aggressive children were more accepted in classrooms with high levels of aggression. DeRosier et al. (1994) found seven- to nine-year-old African American boys randomly assigned to aggressive peer groups were more accepting of aggressive behavior afterward compared to those assigned to groups with low levels of aggression. These studies highlight the importance of the social context and behavior norms for the evaluation of peer aggression.

Social Network Approach to Aggression Norms

Norms are learned in part through one's exposure to the behaviors or attitudes of group members (Lapinski and Rimal 2005). Social network theory suggests this exposure occurs via social relationships—which create a relational structure through which norms diffuse (Wellman 1988). Applied to classrooms, a child's behavior would then relate to whether members of the classroom social network exhibit or endorse the behavior (Gest et al. 2011). Yet, although research indicates that classroom social networks depict varying levels of connectedness and influence among children (Cappella et al. 2013; Pellegrini et al. 2007), traditional methods of calculating classroom descriptive norms rarely considers the social networks within which norms are distributed.

Recent investigations have explored whether the behaviors of high-status classmates or peer groups matter for the social acceptance or behaviors of aggressive children. In a study of Dutch preadolescents, Dijkstra et al. (2008) found the social consequences of aggressive behavior were dependent on the behaviors of the socially prominent classmates as opposed to all classmates. Similar results have been found across the handful of studies examining the behaviors of socially prominent peers (de Bruyn and Cillessen 2006; Farmer et al. 2003). In other research, the relation between a group's behaviors and individual behaviors is stronger when considering the group's network structure (Duffy and Nesdale 2009; Haynie 2001). For example, in a US dataset, Haynie (2001) reported youth were engaged in more delinquent behaviors only when network participants in densely connected networks exhibited delinquent acts.

This and other scholarship (e.g., De Bruyn and Cillessen 2006; Dijkstra et al. 2008; Faris and Felmlee 2011; Juvonen and Galván 2008) suggests that prominent, well-connected children may hold greater influence than non-prominent classmates in the establishment of classroom norms. Yet, classroom descriptive norms are typically calculated by aggregating the individual aggression scores for each child in the classroom—thus each child is assumed to hold equal weight in the establishment of norms. To advance these relevant but distinct bodies of work on connected peers and classroom norms, we use a social

network approach to assess children's social status in the classroom through which norms are communicated.

The Current Study

The present study seeks to advance understanding of classroom normative processes in two ways. First, we aim to advance the measurement of classroom descriptive norms through the integration of social network methods. Specifically, children's peer connections will be assessed using a social network approach involving the aggregation of information from students about their own and classmates' social ties into a classroom social network (cognitive social structures: CSS; Krackhardt 1987). Then, classroom descriptive norms will be adjusted to reflect the relative network position of each child in the classroom. This approach yields "network-based" weighted aggression norms that take into account behaviors in the context of classroom social connections. By giving more weight to the aggression scores of children who are central in the classroom social network, the current study considers the differential social influence of individual children across the classroom.

Second, we examine the moderating effects of network-based overt and relational aggression norms on the relations between aggressive behavior and social preference. A handful of studies have considered aggression form when examining the moderating effects of classroom norms on aggression-social preference relations. However, this work has primarily focused on overt aggression or total aggression (Boivin et al. 1995; Chang 2004). Findings from this work suggest that overtly aggressive children's social acceptance does vary depending on the level of overall overt aggression in the broader context. Yet relational aggression norms have been largely overlooked (Kuppens et al. 2008). By assessing both overt and relational aggression, we examine the need to distinguish between these different aggression forms at both the individual- and classroom-level. Drawing from the person-group dissimilarity model, peers' acceptance or rejection of an aggressive child may not be simply based on the presence or absence of aggression in general, but may depend on whether or not the aggressive behavior form is aligned with the aggression form that is normative across the classroom.

In sum, the current study examines the relations of overt and relational aggression and social preference, and introduces a new approach to assessing and exploring the moderating effect of classroom aggression norms to more fully reflect the social dynamics of the classroom. Consistent with existing theories of normative processes (Chang 2004; Wright et al. 1986), we posit that the social consequences of aggressive behavior (relational or overt) will vary based on the extent to which the specific form of aggression permeates the social context via classroom norms.

Methods

The current study uses a cross-sectional design and data from urban elementary schools to test the moderating effects of network-based classroom overt or relational aggression norms on the associations between aggressive behavior (overt or relational) and social preference.

Setting and Participants

Data come from five urban public elementary schools participating in a longitudinal school-based mental health study. Schools were randomly selected for participation in the broader study using a set of demographic criteria to ensure comparability (>85 % low-income, >85 % African-American, and <35th percentile on state reading tests). All second to fourth grade teachers and students were invited to participate.

All teachers ($N = 34$) provided informed consent. Out of 681 eligible students, 424 children received parental consent and provided assent (primary participants). The names of children without parental consent (secondary participants) were included in data surveys but these children did not complete research measures. This is a common method that is accepted by institutional review boards for compiling information about social networks and behaviors in settings where consent form return rates are traditionally low (Klovdahl 2005; Neal 2008).

The current study uses baseline data collected on 681 children, including similar percentages of second (30 %), third (37.5 %), and fourth (32.5 %) graders, and comparable numbers of boys (51.3 %) and girls (48.7 %). Nearly all children were African-American (97.5 %) and eligible for free or reduced price lunch (96.4 %). Most teachers were female (84.8 %) and self-identified as African-American (45.5 %) or White (42.4 %). Class sizes ranged from 10 to 34 children per classroom ($M = 20$; $SD = 6.91$).

Procedures and Measures

All study procedures and measures were approved by the university and school district institutional review boards. To assess children's perceptions of peer behaviors and relationships, participants with parental consent were administered paper-and-pencil surveys in classrooms during school hours. Prior to administration, school staff provided researchers with class rosters listing the first name and last initial of each student to be used in survey construction. Researchers assisted children as they completed the surveys. Eligible participants absent on the day of administration completed surveys in small groups within 2 weeks of the original administration. After survey completion, all students received a prize valued at less than one dollar.

Social Preference

Following established procedures (Coie et al. 1982), and allowing unlimited responses, two questions were used to assess social preference: "Which of the kids in your class do you like to hang out with the most?" (*like most*) and "Which of the kids in your class do you like to hang out with the least?" (*like least*). Primary participants were asked to circle the names of as many classmates as they wished for each item. The proportion of nominations for each child across classroom respondents was calculated for each question (like most and like least). Next, the difference between the percentages of like most and like least nominations was calculated, resulting in a score ranging from −1 to 1 for each child. A score of −1 indicated a child was nominated by all respondents as liked least and received no nominations for liked most; a score of 1 indicated that a child was nominated by all respondents as liked most and received no nominations for like least. While it is common for studies focused on child-level differences to standardize scores at the classroom level, the current study uses non-standardized scores to allow for the examination of classroom differences (see Chang 2004).

Overt and Relational Aggression

Children's engagement in overt and relational aggression was assessed using behavioral descriptors from the *Children's Social Behavior Scale—Peer Report* (Crick and Grotpeter 1995). Primary participants were asked to circle the names of as many classmates as fit each descriptor. Five *overt aggression* items covered physical behaviors (e.g., "Who pushes and shoves others around?") and verbal behaviors (e.g., "Who calls other classmates mean names?"). Four items composed the *relational aggression* subscale and included social exclusion (e.g., "Who tries to exclude or keep certain people from being in their group when doing things together?") and threats (e.g., "Who lets their friends know that they will stop liking them unless the friends do what they want them to do?").

For each child, nominations for relational/overt aggression were summed and divided by the number of respondents per classroom (minus one if the nominated child was a primary participant) (Sentse et al. 2007; Thomas et al. 2006). Each child received a relational aggression proportion score and an overt aggression proportion score that ranged from 0 to 1. Reliability, factor structure, and validity of the Child Social Behavior Scale—Peer Report have been established in prior research (Crick 1996). Both the overt and relational aggression scales demonstrated adequate reliability in the current sample ($\alpha = 0.93$ and 0.78 respectively).

Classroom Aggression Norms

Classroom norms for overt and relational aggression were calculated using children's: (a) social network centrality, and (b) overt and relational aggression.

Social Network Centrality Cognitive social structures (CSS; Krackhardt 1987) were used to assess each child's centrality within his/her classroom peer social network (Cappella and Neal 2012; Neal et al. 2011). Primary participants completed a survey with a separate page for each child in their classroom. Children were instructed to circle the names of peers from a full class roster that the listed child "hangs out with often." Data from individual respondents were aggregated within each classroom using consensus aggregation in UCINET 6 to create a classmate-by-classmate matrix (see Neal 2008).

To adjust classroom descriptive norms to account for children's network position, two measures of centrality were calculated: (1) degree centrality (Freeman 1979), and (2) alter-based centrality (Neal 2011). *Degree centrality* is the total number of connections a child has within the classroom. *Alter-based centrality* is the connectedness of the child *and* the connectedness of each peer to whom s/he is connected (Neal 2011, 2014). Thus, a child's connections are weighted by the degree centrality of each connected peer and then summed using the following equation:

$$\text{Alter-based Centrality}_i = \Sigma(R_{ij} \times DC_j),$$

where R_{ij} indicates whether a relationship is present between focal child i and peer j and DC_j, is the degree centrality of peer j.

To ease calculation and interpretation, children's alter-based centrality scores were re-scaled so values ranged from 0 to 1. To do this, each child's alter-based centrality score was divided by the maximum alter-based centrality score in his/her classroom. The resulting values reflect, on average, how well connected a child's directly-connected peers tend to be. Large values indicate that a focal child's affiliates tend to have a large number of relationships in the classroom. A value of 0 would indicate that the child was isolated within the classroom network.

Network-Based Aggressive Behavior Next, two weighted scores were calculated for each child, one for overt aggression and one for relational aggression. The weighted scores were calculated by multiplying the child's aggression score by his/her alter-based centrality score. Scores ranged from 0 to 1, with higher scores indicating higher levels of aggressive behavior and more connections to well-connected peers.

Network-Based Aggression Norms These scores were then aggregated (via an arithmetic mean) within each

classroom to create classroom aggression norms for relational and overt aggression. By adjusting each child's aggression score by his/her alter-based centrality, the aggregate score for each classroom is weighted more heavily by the aggression scores of children with higher alter-based centrality.

Average Aggression Norms Mean levels of overt and relational aggression were calculated for each classroom in order to compare findings from models using the network-based centrality norm with findings from models employing more typical methods of calculating norms (Sentse et al. 2007). Thus, two arithmetic means were calculated for each classroom: one for classroom overt aggression and one for classroom relational aggression.

Classroom Network Density

Classroom social network density was calculated from the peer aggregated social networks. This classroom-level structural variable ranges from 0 to 1, and was created in UCINET 6 by dividing the total number of present connections in each whole classroom network by the total number of possible connections (Hanneman and Riddle 2006).

Demographics

Classroom teachers reported on students' gender and free lunch eligibility. Gender was examined at the individual-level (female = 1; male = 0) and classroom-level (% of girls in the classroom). Class size was included as a classroom-level variable.

Results

Preliminary descriptive analysis of the primary study variables are presented below, followed by results from a series of four hierarchical linear models. Model 1 (null model) examined between-classroom variability in social preference. In Model 2, level-1 variables were introduced to examine associations between gender and aggressive behavior (relational or overt) and children's social preference. Model 3 includes classroom-level structural characteristics (class size, percent girls, network density) as control variables and classroom norms of overt and relational aggression. In Model 4, cross-level interactions between individual- and classroom-level characteristics were included to examine whether classroom norms of aggression (overt or relational) moderate the association between a child's relational or overt aggression and his/her social preference. Post hoc analyses were run to compare

models that included network-based norms and regular descriptive norms (i.e., classroom aggression means). In all analyses, no adjustments were made for race/ethnicity or free/reduced lunch status given the homogeneity of the sample. Grade level was tested in preliminary models and removed for reasons of parsimony.

Preliminary Analysis

Prior to testing hypotheses, data examination revealed no missing data for child- or classroom-level variables. Table 1 presents the means, SDs, and correlation coefficients of the child- and classroom-level variables. A series of independent-samples t-tests were conducted to compare mean levels of social preference, relational aggression, and overt aggression between girls and boys. Results indicated that girls were more socially preferred by peers ($M = 0.07$ $SD = 0.25$; $t(645.3) = -4.50$, $p < .001$) and engaged in more relational aggression than boys ($M = 0.18$, $SD = 0.13$; $t(672.4) = -3.86$, $p < .001$). In contrast, mean scores for overt aggression were significantly higher for boys in the sample ($M = 0.27$, $SD = 0.20$; $t(666.4) = 6.40$, $p < .001$). Although grade was not included in final analyses, one-way ANOVAs were run to test possible grade-level differences in social preference and aggression. Similar levels were found across grades.

Bivariate correlation analysis for child variables revealed that relational aggression was positively associated with social preference ($r = 0.220$, $p < .001$). Overt aggression was not related to social preference ($r = -0.004$, $p = .991$). With respect to classroom variables, percent of girls was positively related to relational aggression norms ($r = 0.37$, $p < .05$); class size was negatively related to relational aggression norms ($r = -0.56$, $p < .01$) and overt aggression norms ($r = -0.60$, $p < .001$); and, overt and relational aggression norms were positively correlated ($r = 0.81$, $p < .001$).

Hierarchical Linear Models

In order to adjust for the nested structure of the data (children in classrooms), analyses were conducted within a multilevel modeling framework using hierarchical linear modeling (HLM 6.02, Raudenbush and Bryk 2002). In all models, continuous variables were centered around the group mean at the child-level and the grand mean at the classroom level; categorical variables (e.g., gender) remained uncentered. Full maximum likelihood was employed.

Unconditional Model (Model 1)

An unconditional (i.e., null) model with no explanatory variables was run to determine the amount of variance in social preference that existed between and within classrooms

Table 1 Descriptive statistics and intercorrelations for child- and classroom-level variables

	M	SD	Min	Max	1	2	3	4
Level 1 (child)								
1. Relational aggression	0.17	0.12	0.00	0.68	–			
2. Overt aggression	0.22	0.19	0.00	1.00	0.68***	–		
3. Gender (0 = male 1 = female)					0.15***	0.24***	–	
4. Social preference	0.02	0.25	−0.83	0.80	0.22***	0	0.17***	–
Level 2 (classroom)								
1. Percent female	48.80	10.90	28.00	69.20	–			
2. Class size	20.10	6.90	10.00	34.00	0.03	–		
3. Class density	0.22	0.06	0.13	0.37	0.29	−0.23	–	
4. Relational aggression norm	0.03	0.03	0.01	0.12	0.37**	−0.56**	0.24	–
5. Overt aggression norm	0.04	0.03	0.01	0.13	0.17	−0.60**	0.13	0.81**

Relational and overt aggression norms are network-based

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

(see Table 2). Results revealed significant between-classroom variation in children's social preference scores (Total variance = 0.06, ICC = 0.05, $p < .0001$). This suggests that 95 % of the variance in children's social preference was accounted for by child-level characteristics, while 5 % of the variance was due to differences between classrooms. While the amount of variance between classrooms is small, it is within the range considered worthy of investigation in education research (Koth et al. 2008; Stormshak et al. 1999).

Child-Level Model (Model 2)

Explanatory variables at the child-level were added to explore the effect of children's overt and relational aggression on their social preference (see Table 2). Results revealed that relational aggression positively predicted social preference when controlling for gender and overt aggression ($\gamma_{20} = 1.41$, $p < .001$). Thus, students who were relationally aggressive were more socially preferred compared to their non-relationally aggressive peers. When holding gender and relational aggression constant, overt aggression negatively predicted social preference ($\gamma_{30} = -0.46$, $p < .001$). This suggests students with high levels of overt aggression were less socially preferred than their peers who were not overtly aggressive. Gender was not a significant predictor of social preference beyond relational and overt aggression. An examination of the random slopes indicates that the association between gender and social preference ($\chi^2(33) = 76.13$, $p < .001$) varied among children. Additionally, the associations between relational aggression and social preference ($\chi^2(33) = 77.64$, $p < .001$) and between overt aggression and social preference ($\chi^2(33) = 58.24$, $p < .01$) were found to vary.

Classroom-Level Model: Intercepts Only (Model 3)

The third step was to examine the association between network-based overt and relational aggression norms on children's social preference. Fixed effects for the following classroom control variables were included: percent girls, class size, and classroom density (see Table 2). Results revealed a significant and negative main effect of network-based classroom relational aggression norms on social preference ($\gamma_{03} = -1.27$, $p < .01$). This suggests that, on average, children were more socially preferred by peers when they were in classrooms in which relational aggression was not normative compared to classrooms with higher levels of relationally aggressive behavior. No significant main effects were found for network-based classroom norms for overt aggression on children's social preference. With respect to classroom controls, network density was positively related to social preference ($\gamma_{05} = 0.59$, $p < .05$), suggesting children were more socially preferred in classrooms marked by higher levels of interconnectedness compared to classrooms in which children were less interconnected. No significant effects were found for percent of girls or class size.

Moderation Model: Child and Classroom Levels (Model 4)

Model 4 addressed the primary research aim: To test whether network-based classroom norms of overt or relational aggression moderated relations between aggressive behavior (overt or relational) and social preference. As such, level 2 (classroom) random parameters were added to the model, which allowed the slopes for gender, relational aggression, and overt aggression to vary by classroom.

Table 2 Hierarchical linear model predicting social preference from child characteristics and network-based classroom aggression norms (N = 681)

Fixed effect	β	SE
Social preference intercept	0.03	0.02
Level 1: child		
Female	0.01	0.02
Relational aggression	1.43***	0.16
Overt aggression	−0.49***	0.08
Level 2: classroom		
Percent female $\gamma01$	0.00	0.00
Class size $\gamma02$	0.00	0.00
Relational aggression norms $\gamma03$	−0.98	0.65
Overt aggression norms $\gamma04$	0.66	0.40
Classroom density $\gamma05$	0.06	0.40
Female × social preference slope		
Percent female $\gamma11$	0.00	0.00
Class size $\gamma12$	0.00	0.00
Relational aggression norms $\gamma13$	−0.81	0.94
Overt aggression norms $\gamma14$	−0.30	0.53
Classroom density $\gamma15$	0.81	0.44
Relational aggression × social preference slope		
Percent female $\gamma21$	−0.02	0.03
Class size $\gamma22$	0.02	0.04
Relational aggression norms $\gamma23$	15.70†	7.85
Overt aggression norms $\gamma24$	−10.29	5.26
Classroom density $\gamma25$	2.07	4.49
Overt aggression × social preference slope		
Percent female $\gamma31$	0.02	0.01
Class size $\gamma32$	0.03	0.01
Relational aggression norms $\gamma33$	−9.62**	3.18
Overt aggression norms $\gamma34$	6.57**	2.02
Classroom density $\gamma35$	0.41	1.81

Random effect	Variance component	df	χ^2
Intercept (mean social preference)	0.00	28	61.28***
Female slope	0.00	28	45.81*
Relational aggression slope	0.34		55.63**
Overt aggression slope	0.01		41.88*
Level 1 (r_{ij})	0.04		

Relational and overt aggression norms are network-based

Robust standard errors; † $p = .05$; * $p < .05$; ** $p < .01$; *** $p < .001$

Controlling for all the level 2 variables in Model 3, cross-level interactions were then tested.

Findings revealed significant moderating effects of network-based overt and relational aggression norms on the relation between overt aggression perpetration and social preference (see Table 2). Specifically, in classrooms with
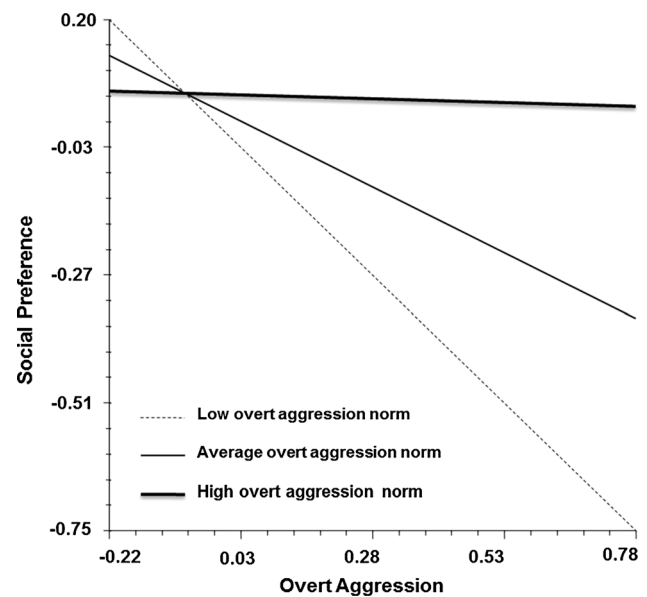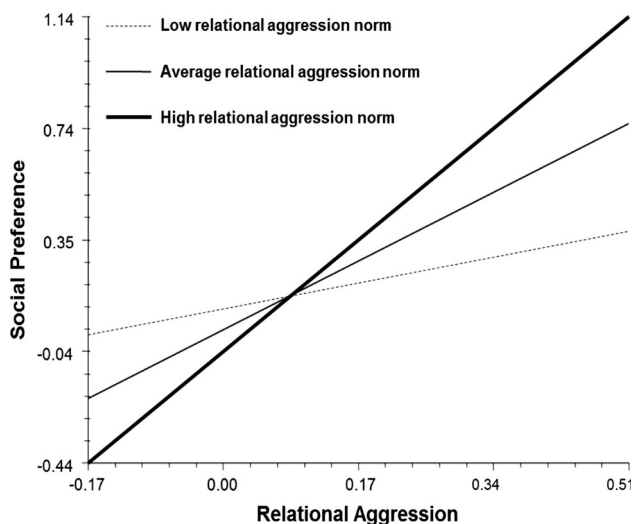

Fig. 1 Effect of network-based overt aggression norms on the association between overt aggression and social preference. Predicted association between overt aggression and social preference at low (mean − 1SD), average (mean), and high (mean + 1SD) levels of network-based overt aggression classroom norms. Predicted social preference values were estimated after controlling for the child and classroom level covariates in Model 4

higher levels of overt aggression, overtly aggressive children were more liked by peers compared to classrooms with lower levels of overt aggression ($\gamma_{34} = 6.57$, $p < .01$; see Fig. 1a), when controlling for relational aggression norms and other classroom factors. In classrooms with higher levels of relational aggression, overtly aggressive children were less liked by their peers compared to classrooms with lower levels of relational aggression ($\gamma_{33} = -9.62$, $p < .01$). These findings are in line with the person-group dissimilarity model (Wright et al. 1986) and suggest that overt aggression is more likely to result in negative social consequences (e.g., peer rejection) when the behavior does not match the classroom norms.

The moderating effect of network-based relational aggression norms on the association between relational aggression and social preference approached significance ($\gamma_5 = 15.70$, $p = .05$) (see Fig. 2). In classrooms where relational aggression was more normative, relationally aggressive children were more liked by peers than in classrooms where relational aggression was less normative. No significant moderating effect was found for overt aggression norms on the link between relationally aggressive behavior and social preference ($\gamma_{24} = -10.9$, $p = .06$). These results are also in line with the person-group dissimilarity model. Relational aggression was found to have a significant and positive relation with social preference; this relation was stronger in classrooms where that same form of aggression (i.e., relational) was more normative.

Fig. 2 Effect of network-based relational aggression norms on the association between relational aggression and social preference. Predicted association between relational aggression and social preference at low (mean − 1SD), average (mean), and high (mean + 1SD) network-based relational aggression classroom norms. Predicted social preference values were estimated after controlling for the child and classroom level covariates included in Model 4

Post Hoc Analysis: Classroom Mean Aggression Norms

Post hoc analyses were run with traditional descriptive norms for aggression (i.e., classroom aggression means). Only one cross-level interaction approached significance ($p = .05$): mean-levels of relational aggression moderated the association between overt aggression and social preference. That is, in classrooms with higher levels of relational aggression on average, overtly aggressive children were less accepted by peers than in classrooms with lower levels of relational aggression (controlling for mean levels of overt aggression and other child- and classroom-level variables).

Discussion

Social-contextual and network theories suggest that settings, and the relationships and norms therein, create a context for reinforcing or discouraging specific behaviors (Seidman 2012; Wellman 1988). Guided by the person-group dissimilarity model (Wright et al. 1986) and social context model (Chang 2004), we tested whether children were more socially preferred when their behavior "fit" the behavioral norms of the classroom social network. Consistent with previous work, we found the association between children's aggressive behavior and their social preference varied depending on network-based aggression norms of the classroom. The moderating effect of aggression norms was

found to be stronger for the association between overt (vs. relational) aggression and social preference. Current findings demonstrate the importance of considering varying forms of aggression when studying classroom aggression norms and highlights the role of social networks in understanding of normative processes within the classroom context.

Aggression Form Matters

We found that relationally aggressive children, on average, were more socially preferred by peers and overtly aggressive children were less socially preferred (controlling for gender and relational aggression). Thus, in the absence of overt aggression, relational aggression did not appear to carry negative social consequences (Smith et al. 2009).

Consistent with previous scholarship (Boivin et al. 1995; Chang 2004; Powers and Bierman 2013; Wright et al. 1986), when overt aggression "fit" the aggressive behavior norms within the classroom, the negative association between overt aggression and social preference was lessened. In classrooms in which overt aggression was less prevalent, overtly aggressive children were less socially preferred. Moreover, when relational aggression was normative, the negative effect of overt aggression on social preference was even more pronounced. Thus, overtly aggressive children may not always be disliked by peers but may be at risk socially if their aggression is not aligned with the norms of the classroom. Moreover, these children may be more at risk when they are in classrooms where their form of aggression contrasts to the form of aggression that is typical in the classroom.

With regards to relationally aggressive children, the moderating effect of classroom aggression norms was less evident, with the coefficient on relational aggression norms approaching significance. Overall, relationally aggressive behavior was positively related to social preference but the magnitude appeared to be stronger in classrooms where relational aggression was normative. That is, relationally aggressive children were even more liked when in classrooms in which their aggressive behavior matched the norms of the classroom. Yet, these relationally aggressive children were still liked in classrooms in which relational aggression was less normative, as well as in classrooms where overt aggression was normative.

Overall, for both overt and relational aggression, children appeared to benefit socially when their aggressive behavior "fit" the norms of the classroom in terms of the aggression form that was prevalent. These findings support Chang's (2004) social context model that classroom aggression norms can strengthen a positive association or attenuate a negative association between aggressive behavior and peer acceptance. Moreover, these findings are consistent with person-environment fit theory (Moos 1987),

which suggests the importance of congruence between the setting and behavior for individual outcomes. Results from the current study also suggest that the social consequences of engaging in peer aggression may depend more on classroom norms when the aggressive behavior is overt in nature.

While conceptualizations of aggression have increasingly expanded to include more than one aggression form, much of the extant research on classroom normative processes continues to assess and analyze aggression as a uniform behavior. Findings from this study show that when studying peer aggression and social preference, the form of aggression that is normative within a classroom as well as the form of aggression a child displays are important to consider.

Aggression Norms Embedded within Classroom Social Networks

To gain understanding of normative processes in a manner that is theoretically grounded and empirically rigorous, this study used social network methods to determine classroom social connections and weighted individual aggression scores by network connectedness prior to calculating classroom normative aggression indices. This method of assessing descriptive norms is rooted in scholarship suggesting that the behavior of salient peers matters for the acceptance and rejection of certain behaviors (Dijkstra et al. 2008), and the social connectedness of children is a mechanism through which peer influence occurs (Freeman 1979; Wasserman and Faust 1994).

In order to determine whether findings from this approach differed from analysis using traditional descriptive norms for aggression, we ran additional analyses with classroom mean levels of aggressive behavior entered in place of the network-based norms. These analyses suggest that even when children's social position and access to peers and resources within the classroom is not considered with respect to classroom norms, a child who engages in overtly aggressive behavior that is explicitly discrepant from that which is normative is likely to be at risk with respect to acceptance among peers. However, unlike the findings from analysis using the network-weighted aggression norms, overt aggression norms did not moderate relations between overt aggression and social preference; and the relation between relational aggression and social preference did not vary by classroom relational or overt aggression norms.

While this study is unable to explain the mechanism underlying normative processes within classrooms, it provides further support for the need to consider classroom norms when studying the acceptance or rejection of aggressive children. Moreover, it highlights the utility of social network data for expanding current methods of assessing

norms in a way that more fully captures the social dynamics that exist in classrooms. Given the importance of interpersonal connections in the diffusion of information about norms, the integration of social network perspectives into the study of classroom norms may enhance the explanatory power of extant theories of normative influences.

Limitations and Future Directions

Several limitations are important to consider. First, the cross-sectional nature of the data prevents any causal statements about links between aggressive behavior and social preference. While the guiding theories for this study purport that individual behaviors predict social preference, it is possible that the reverse is true—children who are rejected by peers engage in aggression, and this association is moderated by classroom aggression norms. Future studies using longitudinal data can help explicate these relations and clarify whether the behavior precedes the social status or vice versa. Second, the current study does not examine the mechanisms underlying the association between classroom norms and the social preference of students with aggressive behaviors. It may be that the information communicated through the classroom social network about the acceptability of aggression relates to shifts in students' social cognitions (Crick and Dodge 1994) or self-concepts (Markus and Wurf 1987) and/or triggers social learning processes (Bandura 1973) that, in turn, are associated with changes in individuals' behaviors or social acceptance. Longitudinal research is needed on these and other mechanisms through which classroom aggression norms may operate.

Third, this study was based on data collected from a homogenous sample of African American children attending low-income urban schools. As such, future work is needed to replicate these findings in diverse samples of elementary school children. Fourth, the current study focused on children's behaviors within the classroom context. However, peer aggression likely occurs in non-classroom contexts as well. Investigations of settings such as the cafeteria, hallways, or neighborhoods (e.g., McMahon et al. 2013) would help to unpack the notion of "fit" and the processes through which norms may impact children's behaviors. For instance, it may be that some children are able to "code-switch" (i.e., able to assess the norms of various contexts and adjust their behaviors accordingly; Molinsky 2007), and other children may be more inflexible (i.e., who use a particular form of aggression no matter what the context may be).

Finally, future studies should consider additional ways of adjusting norms given the range of empirically-based measures that could be used to identify influential members of a classroom (e.g., network power, closeness centrality).

Consistent with previous work (Neal 2011; Wasserman and Faust 1994), the current study identified children with high alter-based centrality (i.e., a large number of direct and indirect connections relative to his/her peers) as major channels of relational information within the peer network. By using alter-based centrality to adjust aggression norms, the current study prioritizes one theory-based mechanism through which norms are established. Other indicators of social status such as perceived popularity (i.e., the extent to which children are viewed as popular by peers) were not considered. Similarly, the notion of alter-based centrality assumes that all connections in one's network are qualitatively equal; however, this may not be the case. Information about the strength of a child's peer connections could be considered via valued network data (Hanneman and Riddle 2006) and used in combination with network centrality to adjust norms. Gaining insight into the strength of connections would allow for the simultaneous consideration of both the quantity and quality of peer connections.

Implications for Research and Practice

Despite limitations, this investigation contributes to research on classroom norms and peer aggression, providing additional evidence that norms contribute to the social acceptance of aggressive children and providing new evidence that social network methods can increase the precision of our understanding of aggression norms. Integrating social network methods into peer aggression and norms research allows classroom-level phenomena to be measured in ways that are not simply derivatives of aggregated individual-level characteristics. While mean levels of overall aggression matter, it may be the aggressive behaviors—relational or overt—of the most highly-connected peers that play a larger role in determining whether aggressive children are socially preferred in different classrooms.

Although implications for practice are tentative given the cross-sectional nature of this study, these findings taken together with prior research (e.g., McMahon et al. 2013; Neal 2009) suggest school-based prevention programs should consider contextual factors related to aggression. Recent calls have been made for bullying prevention efforts to impact and elicit change in classroom and school norms (Rodkin and Gest 2011). Continued efforts to identify classroom features linked with reduced peer support for aggression are critical to guiding these efforts (Garandeau et al. 2011). In addition, while prevention scientists, community psychologists, and educators are beginning to target different forms of aggression, the effectiveness of these programs has not been overwhelmingly strong (Young et al. 2006). By identifying potential sources of influence via network connections and classroom norms, and being specific about when, where, and how to target specific forms

of aggression in context, researchers and educators can work to advance current prevention and intervention efforts to reduce peer aggression in classrooms.

In addition, many of the prevention and intervention practices currently employed in elementary schools are geared toward enhancing the skills of individual children, and do not address the fact that peer aggression may be the norm. The current lack of attention toward normative processes may very well be one of the reasons that peer aggression prevention efforts have struggled to produce positive change (Swearer et al. 2009). Prevention and intervention programs should be evaluated in terms of their ability to promote and facilitate positive classroom norms (Thomas et al. 2011) as well as reduce the diffusion of norms for relational and overt aggression—behaviors that can lead to adjustment problems for the individuals involved and their peers in the classroom social network.

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