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CENTRALITY WITHIN THE PEER GROUP ASA MODERATOR OF PEER GROUP DINFLUENCE ON AGGRESSION

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CENTRALITY WITHIN THE PEER GROUP AS A MODERATOR OF PEER GROUP INFLUENCE ON AGGRESSION

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ABSTRACT

Children's peer groups influence individual behavior and attitudes through group normative influence, which previously has been assumed to affect all group members equally. However, two competing theories suggest that group influence on members may not be uniform. Reciprocal socialization theorists posit that group members who interact with each other more frequently (i.e., central members) will be more influenced by group norms than those who interact less frequently (i.e., peripheral members) as a result of greater opportunity for mutual socialization. Social identity theorists posit that peripheral group members will be more influenced by group norms than central members because conformity to group norms will solidify their precarious group membership. The current study was the first to compare the predictions of these theories in the context of real peer groups (N = 376 children in 65 groups; *M* age = 11.06 years, *SD* = 1.38; 165 boys, 211 girls). A short-term longitudinal design was employed to assess within-group differences in peer group influence on aggression. Peer groups were identified using the well-established social-cognitive map procedure. Both self-reported attitudes about aggression and reports on behavioral aggression from self, peers, and teachers were collected at two time points separated by 6-7 months. Hierarchical linear modeling revealed that higher aggression was associated with peripheral status within the peer group, consistent with the social identity perspective. However, more favorable attitudes toward aggression were associated with central status within the peer group, but primarily in groups consisting mostly of girls, consistent with reciprocal socialization theory. These findings stress the importance of assessing the differential impact of group influence on individual

group members' behavior and attitudes over time.

Keywords: peer groups, reciprocal socialization, social identity theory, aggression

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Introduction

Throughout late childhood, children become increasingly motivated to belong to social groups, or cliques, as they strive to differentiate themselves from the larger social context (Rubin, Bukowski, & Parker, 2006). These cliques consist of three or more individuals, are interaction based (Brown, 1990), and are formed by children themselves on the basis of similar interests, abilities, or activities (Harris, 1995). Being part of a group provides opportunities for members to develop group behavioral standards and expectations, referred to as group norms. Once established, group norms become a salient context for influencing group members' behavior and attitudes (Brown, 1990; Harris, 1995).

Research on group influence has shown that group members tend to become more like one another over time (Prinstein & Dodge, 2008), a process attributed to group normative influence. Distinguishing features of groups emerge through socialization of group norms and differentiate group members from members of other groups (Rubin et al., 2006). Group norms are cognitively represented by individuals as a "group prototype" that informs individuals within and outside of the group as to what the group does or does not represent (Hogg & Reid, 2006). As a result, individuals are categorized as belonging to particular groups because they fit a particular prototype that has been socialized by the group members.

Acquiescence to normative influence occurs because group members need to feel accepted and liked by their group (Aronson, Wilson, Akert, & Fehr, 2004). For example, a member of a group that emphasizes academic performance might become more invested in academics over time to assure continued acceptance by other group members

who value academic achievement (Kindermann, 2007; Chen, Chang, & He, 2003; Chen, Chang, Liu, & He, 2008). The need for acceptance by the peer group may even induce group members to engage in behavior that conflicts with their values. For example, when adolescents were interviewed about their motivations to bully, they said that the need to belong and gain status within their peer group impelled them to bully, even when they held anti-bullying values (Burns, Maycock, Cross, & Brown, 2008). Discrepancies between attitudes and behavior in such a situation may induce cognitive dissonance, an uncomfortable state that motivates individuals to bring their attitudes into line with their behavior (Aronson et al., 2004; Festinger, 1957; e.g., Mills, 1958). The newly formed attitudes then may motivate further problematic (or good) behavior (e.g., Salmvalli & Voerten, 2004). Thus, engaging in group normative behavior may lead to changes in individual behaviors and the attitudes that support them.

Evidence of behavioral and attitudinal change in the direction of group norms has been established in several domains such as prosocial behavior (Ellis & Zarbatany, 2007), academic achievement and motivation (Kindermann, 2007; Chen et al., 2008; Chen et al., 2003; Ryan, 2001), drug use (Patterson, Dishion, Yoerger, 2000; Vitaro, Brendgen, & Wanner, 2005), risky sexual activity (Patterson et al., 2000), and aggression (Salmivalli & Voerten, 2004; Burns et al., 2008; Nesdale, Milliner, Duffy, & Griffiths, 2009; Werner & Hill, 2010). Moreover, the behavior change that results from peer group membership tends to extend into non-peer related contexts (i.e., is permanent). Adolescents who are in groups that support these behavioral norms tend to show increases in norm-endorsement and norm-consistent behaviors outside of their groups as individuals over time (e.g., substance use: Valente, Ritt-Olson, Stacy, Unger, Okamoto,

& Sussman, 2007).

To date, investigations of group socialization effects have rested upon the implicit assumption that behaviors and attitudes of all group members are influenced equally by their group's norms. This assumption derives from theories such as reciprocal socialization (e.g., Cairns, Leung, & Cairns, 1995) and homophily (e.g., Espelage, Holt, & Henkel, 2003). It is first assumed by these theorists that individuals are drawn to others who are similar to them (i.e., homophily). Once similar individuals form a group, they become more alike by directly influencing each other's behavior. The actions of one individual demand accommodation from other individuals with whom they interact. By reciprocating these actions, individuals within a group become more like one another over time. Mechanisms of mutual influence involve a variety of learning processes such as reinforcement, punishment, and observational learning, especially when observed behavior is rewarded (e.g., with peer acceptance; Bandura, 2004). Some evidence of reciprocal socialization of aggression by peers has been provided. For example, in dyadic peer interactions, anti-social male friends reinforce each other's negative behavior by reciprocating talk about deviant behaviors (Dishion, Andrews, & Crosby, 1995).

To account for potential differences in peer group influence on individual group members, reciprocal socialization theory would predict that the more group members interact, the more similar they should become. Thus, group members who are more frequent associates should become more similar over time than those who associate less frequently. To date, this hypothesis has not been tested. Moreover, an alternative theory, social identity theory (e.g., Hogg, 2005), would predict that peripheral group members (i.e., those who associate *less* frequently with other group members) would be more

influenced by the group over time than more frequent (central) associates. The purpose of my thesis is to contrast the predictive utility of reciprocal socialization theory and social identity theory in accounting for within-group differences in group influence on aggression over time.

Social Identity Perspective

According to the Social Identity Perspective (Hogg & Reid, 2006; Hogg, 2005; Hogg, 2001a), which incorporates aspects of both Social Identity Theory (Tafjel & Turner, 1979) and Self Categorization Theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), group members who are more normative (e.g., the most aggressive members of an aggressive group), are more typical or cognitively central (e.g., Kameda, Ohtsubo, & Takezawa, 1997; Jetten, Branscombe, Spears, & McKimmie, 2003), are more trusted and liked, and are therefore imbued with status and popularity (Hogg, 2005) than group members who are less normative. The latter group members do not fit the group prototype, and consequently are not trusted, liked, or popular, and hold a position at the periphery of the group. The degree of prototypicality of a group member affects the behavioral constraints and privileges afforded by the group. Central members have greater power to influence peripheral members because they embody the group norms. Because central members are more trusted, they are assumed to act in the best interests of the group, and therefore are given more latitude to deviate from the group norms (Hogg, 2005). Peripheral members, however, have little latitude to deviate due to the uncertainty of their group membership. Lack of conformity on their part is not tolerated because they are not trusted, and they can easily be segregated from the group due to their position near the boundary of the group (Hogg, 2005).

Children's position within their group has implications for the amount of interaction they have with other group members. Peripheral members of peer groups tend to interact less frequently with other group members than central members (Gest, Farmer, Cairns, & Xie, 2003). This phenomenon may occur because peripheral members can be easily segregated from group interactions. Due to the threat of permanent expulsion from the group, peripheral group members may feel compelled to conform to the group prototype. Thus, according to the social identity perspective, the behavior of peripheral members, should change more markedly toward the group behavioral norm than the behavior of central members, *even though their rate of interaction with group members is lower than that of central members.*

Proponents of the social identity perspective have provided support for the main predictions of the theory primarily using experimentally-formed adult groups. For example, people who hold attitudes concordant with group norms are viewed more positively than group members with dissenting attitudes (Hornsey, Jetten, McAuliffe, & Hogg, 2006), central group members tend to be more popular than peripheral members (Hogg, 2001b; Hogg & Hardie, 1991), and when group behavioral norms conflict with individuals' attitudes, compliance with group norms takes precedence and helps validate status within the group (Terry, Hogg, & White, 1999). The theoretical predictions regarding behavior of peripheral members have rarely been tested, although available evidence is supportive. For example, peripheral members in both experimentally-formed and naturalistic groups (e.g., sororities) try to satisfy group norms even more than central member by showing more out-group derogation than central members (Noel, Wann, & Branscombe, 1995).

Preliminary efforts to test the social identity perspective in the context of children's naturally occuring peer groups have focused on aggressive behavior (e.g., Duffy & Nesdale, 2009; Lansford, Costanzo, Grimes, Putallaz, Miller, & Malone, 2009). For example, in experimentally formed children's groups, children who were peripheral members of experimentally manipulated aggressive groups reported the intent to engage in more aggression than children who were central (Duffy & Nesdale, 2010). We do not yet know whether these findings generalize to real peer groups, or to behavioral influence over time because the longitudinal research necessary to adequately assess differential group influence on group members' behavior has not been conducted to date. In the present longitudinal study, I aimed to fill this research gap by examining peer group influence on the aggressive behavior of central and peripheral group members over an academic year.

Aggression in Peer Groups

Aggression consists of any behavior that intends to harm another person (Parke & Slaby, 1983). This definition covers overt physical and verbal aggression (e.g., taunting, pushing, hitting), as well as indirect or relational aggression (e.g., spreading rumors, excluding others on purpose from activities). Aggressive children tend to be drawn to aggressive peers (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Haynie, 2002; Gini, 2006), and members of aggressive groups tend to become more aggressive over time (Espelage et al., 2003; Duffy & Nesdale, 2009; Werner & Hill, 2010), likely due to the operation of group aggression norms.

Consistent with reciprocal socialization theory and the social identity perspective, when measured at a single point in time, the most aggressive members of overtly

aggressive groups tend to be the central members (Rodkin, Farmer, Pearl, & van Acker, 2000; Cairns et al., 1988; Cillesen & Mayeux, 2004; Duffy & Nesdale, 2009; Rodkin & Ahn, 2009; Lansford et al., 2009; Hoff, Reese-Weber, Schnieder, & Stagg, 2009). It remains to be determined whether changes in overt aggression occur at the same rate for central and peripheral group members of aggressive groups over time. Socialization theories would predict that in aggressive groups, central members should change more over time than peripheral members because they interact more frequently (Gest et al., 2003). In contrast, the social identity perspective would predict that in aggressive groups, peripheral members should change more over time in aggressive behavior than central members due to their desire to remain part of their peer group (i.e., become more "normative"). Predictions of both theories are contingent on peripheral members remaining within the same peer group over time, and other qualifying conditions.

Factors that May Affect Expected Group Normative Influence

At least three factors have the potential to mitigate predictions regarding group normative influence on group members' aggression. First, given that cultural norms for aggression differ for male and female members (Espelage et al., 2003; Killeya-Jones, Costanzo, Malone, Quinlan, & Miller-Johnson, 2007), group gender composition may mitigate the influence of group aggressive norms on group members' behavior. Specifically, aggressive norms in female groups or mixed gender groups might produce less behavior change over time in female group members due to cultural prohibitions against aggression in girls. Male members of male groups might be culturally "freer" to submit to group aggressive norms. Second, group influence is more likely to occur if children remain members of the same group over time. If children leave the group,

aggressive behavior change would not be expected. Thus, membership stability must be taken into account. Third, peer group influence on aggressive behavior might differ in strength as a function of child age. Research has shown that conformity among same aged peers increases between the ages of 7 to 13 years (Costanzo & Shaw, 1966), and children over the age of nine endorse aggressive norms more than do younger children (Salmivalli & Voeten, 2004; Cote, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Neal, 2007). For these reasons, the aggressive behavior of older group members may change more than that of younger group members.

Current Study and Hypothesis

The primary purpose of this study was to contrast the predictions made by social identity theory (Hogg, 2005) and reciprocal socialization theory (Cairns et al., 1995) as regards within-group differences in peer group influence on aggression. To date, longitudinal assessments of peer group influence as a function of individual position within the peer group have not been conducted. A primary advantage of the current study was that individuals were followed over a 6- month period to allow for the examination of effects of group membership on individual aggressive behavior and attitudes. Additionally, reports on aggressive behavior were solicited from multiple informants (self, peer, teacher) to produce a more reliable representation of each child's behavior from multiple perspectives (Renk & Phares, 2004). I hypothesized that individual position within the peer group would moderate the relationship between group aggression and individual aggression at Time 2, with the direction of the predicted moderated relation differing for the two theoretical perspectives. If reciprocal socialization theory is correct, there should be a *positive* relation between network centrality and aggression at

Time 2 because central members interact more frequently and have greater opportunity to socialize each other to group norms. If the social identity perspective is correct, there should be a *negative* relation between network centrality and aggression at Time 2 because peripheral members feel more pressure to secure their group membership by conforming to group norms, resulting in greater normative influence. Regardless of the direction of the relation between network centrality and Time 2 aggression, stronger effects were expected for members who retained their group membership over the 6-month period than those who left their peer group, in older (11 to 14 years) than younger (8 to 10 years) groups, and in male than female groups for reasons stipulated earlier.

Method

Participants

Four elementary schools from a large public school board in Southwestern Ontario volunteered to participate in the current study. Three schools were located in small rural towns and one school was located in a mid-sized city. The sample predominantly consisted of children from lower-middle class families. All students from grades 4 through 8 (M age = 11.06 years, SD = 1.38) in each school were invited to participate (see Appendix A); only those who received parental consent were included in the study. In the fall, 390 students (67.8% consent rate) agreed to participate with their parents' consent (78% Caucasian, 8% Asian Canadian, 14% other; 172 boys, 218 girls). In the spring, 370 participants were available for data collection, and of these, 364 participants had complete data for fall and spring. Participants were offered a $10 gift card for participating in the study. Each homeroom class teacher was given a $25 gift card in the fall and $50 cash in the spring in return for completing a behavioral rating

form for each of their participating students. Schools were given a one-time honorarium of $500 for their participation in the study.

Measures

The present study was part of a larger study on peer group influence. Only the measures used in the present study are described here. For a summary and references, see Table 1.

Aggression.

Revised Class Play. The original Revised Class Play is a peer-nomination measure assessing three major facets of behavior: sociability-leadership, aggression-disruptive behavior, and sensitivity-isolation (Masten et al., 1985). In this measure children are asked to pretend that they are the director of a play and nominate other participating students from their home classrooms to fulfill certain roles in this play (e.g., "someone who is... description"). For the present study, names of participating classmates were displayed on the classroom chalk board, and children were restricted to this group of nominees. Children were allowed to nominate a maximum of 3 students, including themselves, as best fitting each description, and were told they could nominate the same person to fulfill multiple roles (i.e., someone who teases other people too much, someone who picks on others, and a person who gets into a lot of fights). If children felt there was no appropriate nominee for a role, they were told to leave the descriptor blank. Individual scores were derived by aggregating all nominations for each participant on individual items. Item nomination scores were then standardized based on the number of students participating from each classroom.

Table 1

Measures of Aggression

Measure	Reference	Report Type and Items Assessing Aggression	Reliability (Cronbach's α)
Revised Class Play	Crick & Grotpeter, 1995; Masten et al., 1985	Peer nomination; 3 questions on overt aggression, peers nominate someone who would fit a particular profile	Fall 2008 = 0.88; Spring 2009 = 0.91
Teacher-Child Rating Scale	Hightower et al.,1986	Teacher-report; 2 likert scale questions assessing how true the overt aggression items are of each child	Fall 2008 = 0.64; Spring 2009 = 0.64
Self-reported Bullying	Schwartz et al., 2005	Self-report; 4 likert scale questions; frequency of bullying	Fall 2008 = 0.70; Spring 2009 = 0.78
Attitudes towards Aggression	Dahlberg et al., 2005	Self-report; 6 likert scale questions; attitudes about using overt aggression towards others	Fall 2008 = 0.81, Spring 2009 = 0.80

For the purpose of this study, only the three items assessing overtly aggressive behavior were considered (teases other people too much, picks on others, gets into a lot of fights). Standardized item scores were summed and re-standardized to create a score for peer-nominated aggression. Aggregated scores had good internal consistency (Fall 2008: $\alpha = 0.88$, Spring 2009: $\alpha = 0.91$).

Teacher-Child Rating Scale (TCRS). The TCRS is a 40-item teacher report measure designed to assess children's problem behaviors and competencies. Each child's homeroom teacher was asked to rate how well each item described the particular child on a scale ranging from 1 (not at all) to 5 (very well). Teachers also rated the student's skills in reading, writing, and mathematics on a similar 5-point scale (1= far below grade level, 5= far above grade level). From this scale two items were used to assess overt aggression; "Picks on other kids" and "Overly aggressive to peers (fights)." These scores were then averaged to derive one score that had acceptable internal consistency (Cronbach's α fall = 0.64, spring = 0.64).

Self-reported bullying. This measure consists of four questions in which children are asked to describe their aggression toward peers at school over the past four weeks. They mark the item that best describes how often (1 = never, 2 = once, 3= a few times, 4 = a lot of times) they have initiated each of four behaviors: make fun of another kid, hit or push another kid, leave another kid out of fun activities on purpose, and use email or instant messages to tease or say mean things about another kid. Items were consolidated to produce one self-report aggression score (Fall 2008: Cronbach's $\alpha = 0.70$; Spring 2009: Cronbach's $\alpha = 0.78$).

Attitudes Toward Aggression. Adapted from a subscale by Farrell, Meyer, and

White (2001), this measure consists of 6-items intended to assess an individual's attitudes towards aggression. Children are asked to select the choice that best describes their experiences and ideas on a 4-point scale (1 = disagree strongly, 4 = agree strongly). Items on this scale included, it's O.K. for me to hit someone to get them to do what I want; sometimes a person doesn't have any choice but to fight; if I back down from a fight, everyone will think I'm a coward; I feel big and tough when I push someone around; if people do something to make me really mad, they deserve to be beaten up; and sometimes I only have two choices: get punched or punch the other kid first. This scale had good internal consistency within the present study (Fall 2008: Cronbach's $\alpha = 0.81$, Spring 2009: Cronbach's $\alpha = 0.80$).

Peer group identification.

Peer groups were identified based on the social-cognitive map (SCM) procedure (Cairns, Gariepy, Kindermann, & Leung, 1991). Students were asked to recall groups of children who attend their school and spend a lot of time together. To obtain information about other groups of children, students were asked "Are there people who hang around together a lot? Who are they?" Children could list a maximum of 5 different groups, beginning with their own group (i.e., "Do you hang around with any group?"). If they reply yes, they are then asked to list the names of their group-mates, beginning with the group leader. Based on this information, matrix equations were used to identify clusters of students who were often observed together by others or reported spending time together. When children were identified as belonging to multiple groups, I examined the correlation matrix to determine to which group the participant best belonged. The individual was assigned to the group with which he/she had the highest correlations ($r >$

0.50) with others in the group.

The equations produced by SCM also assign each group member a centrality status (nuclear, secondary, peripheral). These status roles are determined by how frequently each student is identified as belonging to a group, with children who are nominated more frequently as group members being placed as more central in the group than those less frequently nominated. This measure of centrality assesses visibility of group members (Cairns et al., 1991). Additionally, I chose this method as the preferred method of assessing centrality when centrality was conceptualized as prototypicality, as individuals who are more frequently nominated (i.e., central to the group) tend to be named in a particular and constant order by others (Cairns, Perrin, & Cairns, 1985). This tendency to name certain members first and in a particular order is reflective of concepts that are conceptually organized in a prototypical way (e.g., Rosch, 1973).

Centrality of the individual within the group was determined by taking the average number of nominations of the two most highly nominated group members and identifying these members as nuclear members. Group members whose frequency of nominations was greater than 70% of this average were classified as nuclear (central), members who had between 30% and 70% frequency of nomination of this average were classified as secondary, and members who had frequency of nominations less than 30% of the average of the two most highly nominated peers were classified as peripheral status. Students not belonging to any group were listed as isolates. Previous research has found that the use of the SCM measure has resulted in high levels of consensus among respondents regarding peer group composition and high levels of stability among measures of network centrality ($r = 0.70$; Cairns et al., 1985).

Based on the SCM procedure, 65 non-overlapping groups (22 male, 22 female, 21 mixed sex) ranging in size from 3 to 12 members (*M* members = 5.35, *SD* = 2.27) were identified in Fall, 2008. Fourteen participants were not included in the analyses because they did not belong to a peer group ($n = 12$) or did not belong to a group with three or more members ($n = 2$). This resulted in a sample size of 376 students (165 boys, 211 girls; *M* age= 11.08 years, *SD* = 1.37) distributed as follows: Grade 4 ($n = 74$; 28 boys, 46 girls; *M* age = 9.26, *SD* = 0.44), Grade 5 ($n = 110$, 58 boys, 52 girls; *M* age = 10.37, *SD* = 0.32), Grade 6 ($n = 90$; 40 boys, 50 girls; *M* age = 11.43, *SD* = 0.37), Grade 7 ($n = 56$; 26 boys, 30 girls; *M* age = 12.42, *SD* = 0.33), and Grade 8 ($n = 46$; 13 boys, 33 girls; *M* age = 13.39, *SD* = 0.31). For the distribution of girls, boys, and mixed sex peer groups in each grade, please see Table 2. Of these children, 36 (9.6%) individuals were identified as peripheral members of their peer group, 138 (36.7%) were identified as secondary members of their peer group, and 202 (53.7%) were nominated as central members of their peer group. Of those who received peripheral nominations, 5 had one nomination into their peer group, and of these, 2 were self-nominated.

Procedure

Once school board permission was granted, a general email was sent to all principals within the school board to invite participation in the study. Four school principals responded. Early in the fall, research assistants visited eligible classrooms (grades 4-8) in the four schools to inform students about the study and answer any questions. At this time, consent forms were distributed to the students to take home to their parents or guardians to sign (see Appendix B). All children were given approximately two weeks to reply; pizza parties were offered to classes with the highest

Table 2

Distribution of Girl, Boy, and Mixed Gender Peer Groups by Grade

Grade	Number of groups			
	All girls	All boys	Mixed gender	Total
4	5	3	3	12
5	4	5	7	19
6	4	5	6	16
7	5	4	1	9
8	4	3	1	9
Total	22	22	21	65

return rate regardless of the decision made by students and parents (consent forms had a negative option). Participating students completed the first survey from mid-October to late-November, and the second survey in late May to early June of 2009 as a group in their home classrooms. As part of a larger study, but not reported here, children were also videotaped interacting with their peer groups in a one-hour session between these two time points (February-April, 2009). General survey instructions (see Appendix C) were read aloud to all participating students to ensure their comprehension. For students in Grades 4 and 5, the entire survey was read aloud; children in older grades completed the survey at their own pace. For the Revised Class Play and SCM measures, instructions were read aloud to all classes. One or two research assistants were available for the duration of the survey to answer students' questions or to help with reading. During this time, home-room teachers were asked to complete Teacher-Child Rating Scale. If they did not finish by the time students completed the survey, they were given an envelope to mail completed forms back to the University.

Results

Handling of Missing Data

To examine differences between children who were and were not available for data collection in the spring, a multivariate analysis of variance (MANOVA) was conducted on aggression scores (see Table 3). No significant differences were found between children who stayed in the study and those who dropped out (*Wilks* = 0.98, $F(2, 311) = 2.02$, $p > 0.05$). Even though 364 children had both waves of data, a few children did not complete a whole measure or enough of the measure to give an unbiased estimate of the variable (see Table 4). Additionally, because the focus of this study is on children in peer

groups, any children who were not nominated into a peer group had to be removed from the sample, leaving only 352 children and 60 peer groups. Given this reduction in sample size, multiple imputation was used to calculate scores for children who had missing data on any of the variables using the Markov Chain Monte-Carlo algorithm in LISREL. This method accounts for variation in scores and replaces missing values with plausible values, making it superior to inputting mean scores for missing data (Schafer & Olsen, 1998). Using multiple imputation allowed the entire sample to be included, with the exception of children who were not nominated into peer groups (14), providing a final sample size of 376 children nominated into 65 peer groups.

Overview of Descriptive Analyses

Descriptive information for each aggression score (range, mean, standard deviation, and number of participants with scores greater than one standard deviation above the mean) is presented in Table 5. Individual aggression scores were checked for age and gender differences using MANOVA, and zero-order correlations were computed among the various aggression indices separately for boys and girls. To determine if the behavioral aggression scores could be consolidated into one score, a principal components factor analysis with oblique rotation was conducted on Time 1 and Time 2 peer-reported, teacher-reported, and self-reported behavioral aggression scores. Based on these analyses, a factor score for behavioral aggression was created and used as an outcome variable (Time 2) and a control variable (Time 1) in the remaining analyses of behavioral aggression. A 5 (grade) x 2 (gender) ANOVA was conducted to identify grade and gender differences in the behavioral aggression factor score. Finally, checks for

Table 3

Means and Standard Errors of Time 1 Variables for Participants Who Dropped Out Versus Those Who Remained and Corresponding F values and Significance

Variable	*M* for drop out participants (n = 20)	*M* for remaining participants (n = 370)	ANOVA F (1, 314)
Peer reported aggression	-0.23	0.02	1.03
	(0.24)	(0.06)	
Teacher reported aggression	1.56	1.42	0.57
	(0.19)	(0.04)	
Self reported bullying	1.69	1.53	1.08
	(0.15)	(0.03)	
Attitudes towards aggression	1.97	1.67	2.86
	(0.17)	(0.04)	

Table 4

Missing Data for Individuals Nominated into Peer Groups

Measure	Missing due to absenteeism or moving		Missing more than 50% of measure items		Total missing data Wave 1 (percent)	Total missing data Wave 2 (percent)
	Wave 1	Wave 2	Wave 1	Wave 2		
Self reported bullying	5	19	22	11	27 (7.2%)	30 (8.0%)
Attitudes towards aggression	5	19	11	5	16 (4.3%)	24 (6.4%)
Teacher reported aggression	5	19	44	15	49 (13.0%)	34 (9.0%)

Table 5

Range of Scores, Means, Standard Deviations, and Number of Participants 1 Standard Deviation or More Above the Mean for Individual Aggression Scale scores at Time 1 and Time 2

Variable	Minimum score	Maximum score	M (SD)	N 1 SD or more above mean (%)
Time 1				
Self Reported Bullying	1.00[a]	3.75	1.516 (0.549)	57 (15.2)
Peer Reported Aggression	-1.07	4.00	0.017 (0.978)	52 (13.8)
Teacher Reported Aggression	1.00[b]	4.50	1.411 (0.711)	46 (12.2)
Self Reported Attitudes Towards Aggression	1.00	4.00	1.668 (0.668)	53 (14.1)
Aggression Factor Score	-1.039	4.161	0.000	53

			(1.000)	(14.1)
Time 2				
Self Reported Bullying	1.00[c]	4.00	1.504	48
			(0.577)	(12.8)
Peer Reported Aggression	-1.07	3.45	-0.002	55
			(0.964)	(14.6)
Teacher Reported Aggression	1.00[d]	4.00	1.553	39
			(0.821)	(10.4)
Self Reported Attitudes Towards	1.00[e]	4.00	1.691	58
Aggression			(0.638)	(15.4)
Aggression Factor Score	-1.186	3.919	0.000	56
			(1.000)	(14.9)

Note. Due to the use of LISREL to estimate missing data, for some participants' scores fell below the minimum scale score.
[a]1 participant had a score of 0.95. [b]4 participants had scores ranging from 0.70 to 0.89. [c]2 participants had scores ranging from 0.79 to 0.99. [d]5 participants had scores from 0.50 to 0.96. [e]1 participant had a score of 0.97.

within-group similarity on behavioral aggression and attitudes toward aggression were carried out using intra-class correlations (ICC) and simple correlations between individual and group measures.

Grade and Gender Differences in Aggression of Group Members (N = 376)

To check for differences in aggression as a function of gender and age, a 5 (grade: 4, 5, 6, 7, 8) x 2 (gender) MANOVA on the four aggression scores (peer reported aggression, teacher reported aggression, self reported bullying, and self reported attitudes) was conducted. Significant multivariate main effects were found for grade (*Wilks* = 0.93, F (16, 1110) = 1.73, $p < 0.05$), and gender (*Wilks* = 0.83, F(4, 363) = 18.41, $p < 0.001$), but the multivariate grade x gender interaction was not significant Means, standard errors, and univariate ANOVA statistics for gender and grade main effects are presented in Tables 6 and 7. Grade differences were produced by the two self-report measures. Post-hoc Tukey's HSD tests showed that children in grade 4 reported significantly less ($M = 1.405$, $SE = 0.06$) bullying than children in grade 7 ($M = 1.61$, $SE = 0.07$, $p < 0.05$) and grade 8 ($M = 1.75$, $SE = 0.09$, $p < 0.01$); children in grade 8 reported more bullying than those in grade 5($M = 1.55$, $SE = 0.05$, $p < 0.05$) and grade 6 ($M = 1.47$, $SE = 0.06$, $p < 0.01$); and children in grade 4 were less endorsing of attitudes towards aggression ($M = 1.52$, $SE = 0.07$) than children in grade 5 ($M = 1.73$, $SE = 0.06$, $p < 0.05$), grade 7 ($M = 1.84$, $SE = 0.08$, $p < 0.01$), and grade 8($M = 1.83$, $SD = 0.10$, $p <$ 0.05). Boys were rated as more aggressive than girls by peers, teachers, and themselves. They also held more positive attitudes toward aggression than girls.

Table 6

Grade Differences (with Means and Standard Errors) for Peer Reported Aggression, Teacher Reported Aggression, Self-Reported Bullying and Attitudes Towards Aggression, at Time 1

Variable	Grade 4 (n = 74)	Grade 5 (n = 110)	Grade 6 (n = 91)	Grade 7 (n = 55)	Grade 8 (n = 46)	ANOVA F (4, 366)
Peer reported aggression	0.11 (0.11)	-0.01 (0.09)	0.08 (0.10)	0.07 (0.13)	0.22 (0.15)	0.45
Teacher reported aggression	1.52 (0.08)	1.49 (0.07)	1.40 (0.07)	1.33 (0.10)	1.32 (0.12)	1.00
Self reported bullying	1.41^{c} (0.06)	$1.55^{c,d}$ (0.05)	$1.47^{c,d}$ (0.06)	$1.61^{d,e}$ (0.07)	1.75^{e} (0.09)	3.26*
Attitudes towards aggression	1.52^{a} (0.07)	1.73^{b} (0.06)	$1.64^{a,b}$ (0.06)	1.84^{b} (0.08)	1.83^{b} (0.10)	2.93*

Note. For significant F scores, means within a row not sharing superscript are significantly different.
* $p < 0.05$

Table 7

Gender Differences (with Means and Standard Errors) for Peer Reported Aggression, Teacher Reported Aggression, Self-Reported Bullying, and Attitudes Towards Aggression at Time 1

Variable	Boys (n = 165)	Girls (n = 211)	ANOVA F (1, 366)
Peer reported aggression	0.43	-0.25	42.06***
	(0.08)	(0.07)	
Teacher reported aggression	1.53	1.29	9.16**
	(0.62)	(0.05)	
Self reported bullying	1.71	1.41	25.43***
	(0.05)	(0.04)	
Attitudes towards aggression	1.96	1.47.	50.94***
	(0.05)	(0.04)	

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Correlations among variables by gender at Time 1. Means, standard deviations, and zero-order correlations among variables at Time 1 are presented separately for boys and girls in Table 8. All measures of aggression were significantly correlated for both boys and girls except teacher reported aggression and self reported bullying. For girls, attitudes towards aggression did not correlate significantly with either teacher reported aggression or peer reported aggression.

Factor analyses of behavioral aggression. To determine if the behavioral aggression measures could be consolidated into one score, separate principal components factor analyses with oblique rotations were conducted on Time 1 and Time 2 behavioral aggression scores (peer nominated aggression, teacher nominated aggression, and self-reported bullying). For Time 1, all items loaded on a single factor accounting for 57% of variance in total scores. Factor loadings ranged from .61 for self reported aggression to .87 for peer reported aggression. For Time 2, factor loadings ranged from .61 for self reported aggression to .88 for peer reported aggression and loaded onto a single factor that accounted for 61% of variance in total scores. All further analyses on behavioral aggression were carried out using the aggression factor scores. For the range of factor scores and percent of participants who fell more than one standard deviation above the mean, see Table 5.

Table 8

Means, Standard Deviations, and Zero-Order Correlations for Individual Variables at Time 1

		M (*SD*)	1	2	3	4
1	Peer reported aggression	0.02 (0.98)	—	0.34**	0.30**	0.13
2	Teacher reported aggression	1.41 (0.71)	0.61**	—	0.07	0.04
3	Self reported bullying	1.52 (0.55)	0.33**	0.15	—	0.55**
4	Attitudes towards aggression	1.67 (0.67)	0.31**	0.18*	0.66**	—

Note. Correlations between measures for girls are reported above the diagonal, and correlations between measures for boys are reported below the diagonal.
*$p < 0.05$, ** $p < 0.01$

Grade and gender differences in behavioral aggression. A 5 (grade: 4, 5, 6, 7, 8) X 2 (gender) ANOVA was used to check for grade and gender differences on the factor score at Time 1 and Time 2. For both Time 1 and Time 2, the only significant main effect was gender, Time 1: $F(1, 366) = 42.19, p < 0.001$; Time 2: $F(1, 366) = 45.14, p < 0.001$. At each time point, boys (Time 1: $M = 0.41$, $SE = 0.08$; Time 2: $M = 0.42$, $SE = 0.08$) were significantly more aggressive than girls (Time 1: $M = -0.29$, $SE = 0.07$, Time 2: $M = -0.29$, $SE = 0.06$).

Group homogeneity on aggression. To investigate similarity between children within peer groups on behavioral aggression and attitudes towards aggression, an intra-class correlation (ICC) was computed to examine the proportion of variance between members of different peer groups in comparison to children within a peer group. Higher values indicate more homogeneity within than between peer groups. These values were around 0.14-0.15 (see Table 9), which is typical of research in social contexts (e.g., Peugh, 2010). Additionally, correlations between each individual's score and the average score of the peer group (with the individual excluded) were calculated (see Kindermann, 1993) and ranged from 0.54 to 0.57. These analyses indicated a high amount of within-group homogeneity on aggression variables.

Table 9

Group Homogeneity and Intra-Class Correlations

Variable	Between-group variance	Within-group variance	Intra-Class Correlation	Child-group correlation
Aggression factor	0.386	0.856	0.15***	0.54***
Attitudes towards aggression	0.059	0.344	0.14***	0.57***

Note. $*p < 0.05$, $** p < 0.01$, $***p < 0.001$

Hypothesis Testing Using HLM: Analytic Overview

To address the main research question regarding differential influence of aggressive group norms as a function of individual position within the peer group, a multilevel model is required to account for the nesting of data from individuals within groups. Hierarchical Linear Modeling (HLM; Bryk & Raudenbush, 1992) permits individual and group level data to be examined within the same model, allowing for estimations of variance due to both within-group member differences (e.g., individual position within group) and between group differences e.g., aggression). I used a 2-level model to control for individual aggression at Time 1, while examining the effect of group aggression and individual position within the group at Time 1 on individual aggression at Time 2. The steps needed to carry out this analysis are explained in the following section.

Fully unconditional model. The first step of HLM requires that one test a fully unconditional model to determine if average individual aggression at Time 2 differs systematically across peer groups. In the equation below, the intercept β_{0j} refers to average individual aggression at Time 2 for adolescents in peer group *j*, and e_{ij} refers to the error term for the youth *i* in peer group *j*.

Individual Aggression Time 2 = $\beta_{0j} + e_{ij}$ (error)

Based on this model, I looked at the intra-class correlation to determine if the variance in individual aggression at Time 2 could be attributed to between-group variance. If so, then HLM analysis was appropriate.

Level 1 analysis. Within a multilevel model, the first level is the simplest level of analysis. In the current study, this is the analysis at the individual level, or the within-group level (the within-group random intercept model). At this level, individual

aggression at Time 2 is predicted from Time 1 individual aggression for each individual *i* within peer group *j*, and Time 1 position within the peer group for each individual *i* within peer group *j*. The goal of this step of analysis is to examine contributions of individual level predictors to Time 2 individual aggression.

$$(\text{Individual Aggression Time 2})_{ij} = \beta_{0j} + \beta_{1j}\,(\text{individual aggression Time 1}_{ij}) + \beta_{2j}\,(\text{position within the peer group Time 1}_{ij}) + r_{ij}(\text{error})$$

Level 2 analysis. The Level 2 model takes into consideration group differences in aggression that may help explain additional variance in Time 2 aggression. Variables at Level 2 are derived by taking the average of individual group members' scores. Peugh (2010) suggests that when the research question concerns cross-level interactions between individual and group level variables, Level 2 predictors should be added both at the intercept (β_{0j}; i.e., randomly varying intercept) and slope of the Level 1 variable of interest (β_{2j}; i.e., individual position within the peer group) to allow main and interaction effects to be estimated in a way similar to factorial ANOVA. Given that the focus of the current study is on the slope of the interaction between group level influence and individual position within the peer group, group aggression and group gender (i.e., proportion of girls in the group) were added to both the intercept (β_{0j}) and slope of individual position within the peer group (β_{2j}) for each of the initial models (see Table 10 for a list of all initial HLM models). Interaction terms were computed manually (i.e., in SPSS) and added to the model to account for group gender differences in aggression. Random effects (μ_{01}, μ_{21}) were included in these models to account for variation in aggressive behaviors across peer groups (Peugh, 2010). To improve model fit, non-significant predictors were removed (West, Welch, & Gałecki, 2007). The predictor

variables of interest (γ_{21}: interaction between group aggression and individual position within the peer group; γ_{22}: interaction between group gender and individual position within the peer group; γ_{23}: interaction between group gender, group aggression, and individual position within the peer group) were examined to determine if these group level variables interacted with individual position within the peer group to produce changes in individual aggression over time.

When the main hypothesis was supported (i.e., a significant interaction was obtained between group aggression and individual within-group status), the potential moderating effects of age and group membership stability were tested. Group age, and the interaction between group age and group aggression were added to the Level 2 model, and group membership stability was added to the Level 1 model.

The equations below represent the group level variables that were tested for effects on Time 2 aggressive behavior and attitudes towards aggression:

$B_{0j} = \gamma_{00} + \gamma_{01}$(group aggression Time 1_j) + γ_{02}(group gender Time 1_j) + γ_{03}(group gender X group aggression Time1_j) + μ_{0j}

$B_{2j} = \gamma_{20} + \gamma_{21}$(group aggression Time 1_j) + γ_{22}(group gender Time 1_j) + γ_{23}(group gender X group aggression Time1_j) + μ_{2j}

To avoid issues such as multicollinearity, Level 1 variables were group mean centered, and Level 2 variables were grand mean centered. Given that the main research question involved the interaction between a Level-1 predictor (within-group position) and a Level-2 predictor (group aggression), group mean centering was used to permit examination of individual status differences in group members' Time 2 aggression relative to their own group aggression norms. Variables at Level 2 were grand mean

centered.

If individual position within the peer group moderates the effect of group aggression on future aggressive behavior, the value of γ_{21} (group aggression X position within the peer group Time 1_{ij}) should be significant at the level 2 analysis, based on the full model. Separate analyses were run on the behavioral aggression factor score and the self reported attitudes towards aggression score. For the sake of space, only significant findings are reported. All other findings are available upon request.

Table 10

Hierarchical Linear Models Tested

Model tested	Level 1 equation	Level 2 equations
Fully Unconditional Model	(Individual Aggression Time 2)$_{ij}$ = β_{0j} + r_{ij}(error)	$B_{0j} = \gamma_{00} + \mu_{0j}$
Level 1 Model	(Individual Aggression Time 2)$_{ij}$ = β_{0j} + β_{1j} (individual aggression Time 1$_{ij}$) + β_{2j} (position within the peer group Time 1$_{ij}$) + r_{ij}(error)	$B_{0j} = \gamma_{00} + \mu_{0j}$
Main Hypothesis	(Individual Aggression Time 2)$_{ij}$ = β_{0j} + β_{1j} (individual aggression Time 1$_{ij}$) + β_{2j} (position within the peer group Time 1$_{ij}$)+ r_{ij}(error)	$B_{0j} = \gamma_{00} + \gamma_{01}$(group aggression Time 1$_j$) + γ_{02}(group gender Time 1$_j$) + γ_{03}(group gender X group aggression Time 1$_j$) + μ_{0j} $B_{2j} = \gamma_{20} + \gamma_{21}$(group aggression Time 1$_j$) + γ_{22}(group gender Time1$_j$) + γ_{03}(group gender X group aggression Time1$_j$) +

		μ_{2j}
Additional analyses part 1: Membership stability	(Individual Aggression Time 2)$_{ij}$ = β_{0j} + β_{1j} (individual aggression Time 1$_{ij}$) + β_{2j} (position within the peer group Time 1$_{ij}$) + β_{3j} (membership stability$_{ij}$)+ r_{ij}(error)	$B_{0j} = \gamma_{00} + \gamma_{01}$(group aggression Time 1$_j$) + γ_{02}(group gender Time 1$_j$) + γ_{03}(group gender X group aggression Time 1$_j$) + μ_{0j} $B_{2j} = \gamma_{20} + \gamma_{21}$(group aggression Time 1$_j$) + γ_{22}(group gender Time 1$_j$) + γ_{03}(group gender X group aggression Time1$_j$) + μ_{2j}
Additional analyses part 2: Group age	(Individual Aggression Time 2)$_{ij}$ = β_{0j} + β_{1j} (individual aggression Time 1$_{ij}$) + β_{2j} (position within the peer group Time 1$_{ij}$) + β_{3j} (membership stability$_{ij}$)+ r_{ij}(error)	$B_{0j} = \gamma_{00} + \gamma_{01}$(group aggression Time 1$_j$) + γ_{02}(group gender Time 1$_j$) + γ_{03}(group gender X group aggression Time1$_j$) + γ_{04}(group age Time 1$_j$) + γ_{05}(group age X group aggression Time 1$_j$) + μ_{0j} $B_{2j} = \gamma_{20} + \gamma_{21}$(group aggression Time 1$_j$) + γ_{22}(group gender Time 1$_j$) + γ_{23}(group gender X group aggression Time1$_j$) + γ_{24}(group age Time 1$_j$) + γ_{25}(group age X group aggression Time 1$_j$) +μ_{2j}

Note. The main hypothesis evaluated whether individuals in groups with aggressive norms would change their individual aggression

over time based on their individual position within the peer group. The outcome variable of interest was γ_{21}, which represented differences in individual aggression at Time 2 dependent upon individual position within the peer group and group level aggression. The first additional analysis tested whether this relationship varied depending on whether or not individuals stayed within the same peer group, with the outcome of interest being β_{3j} (intercept at individual staying in the same group). The second additional analysis evaluated whether the relation between group aggression and individual position within the group varied as a function of age, with γ_{22} as the outcome of interest (interaction between group age, group aggression, and individual position within the peer group in predicting Time 2 individual aggression).

Behavioral Aggression Factor

Fully unconditional model. A significant ICC accounted for 14.84% variance between groups and signified that there was within-group similarity on the aggregated aggression score. As a result, I was able to reject the null hypothesis ($\tau = 0.14916$, $\chi^2(64) = 128.39$, $p < 0.001$) and conduct HLM analyses to account for between-group differences and within-group similarity.

Within-group model (Level 1). Individual aggression at Time 1 significantly predicted Time 2 aggression (see Table 11). However, individual position within the peer group was not a significant predictor of Time 2 aggression at Level 1. These analyses indicate that individual level variables accounted for 53.8% of the variance in individual aggression at Time 2 and justified the need to account for group level differences, as a significant proportion of variance between groups still remained to be explained ($\chi^2(64) = 460.45$, $p < 0.001$).

Between-group models (Level 2). I hypothesized that individual position within the peer group would moderate the relationship between group aggression and individual aggression at Time 2, with the direction of the predicted moderated relation differing for the two theoretical perspectives. After running the proposed model (see Table 10), individual aggression at Time 1(γ_{10}), group aggression (γ_{01}), and group gender (γ_{02}) significantly predicted individual aggression at Time 2 (see Table 12). Children who were more aggressive at Time 2 were more aggressive at Time 1, were members of aggressive groups at Time 1, and were members of groups consisting of a higher proportion of boys. Most importantly, individual position within the peer group moderated the relation between group aggression (γ_{21}) and individual aggression at Time 2. Figure 1 depicts this

Table 11

Hierarchical Models for Level I Variables (Within-group level)

Variable	Coefficient	*SE*	t test	$\chi^2(64)$
Behavioral Aggression Factor				
For intercept β_{0j}				
Intercept γ_{00}	<0.001	0.0702	<0.01	460.45***
For intercept β_{1j}				
Individual aggression at Time 1 γ_{10}	0.8472	0.0344	24.66***	
For intercept β2j				
Individual position in group γ_{20}	0.0187	0.0398	0.47	
Attitudes Towards Aggression				
For intercept β_{0j}				
Intercept γ_{00}	1.6982	0.0427	39.76***	184.54***
For intercept β_{1j}				
Individual aggression at Time 1 γ_{10}	0.5175	0.0519	9.97***	
For intercept β_{2j}				
Individual position in group γ_{20}	0.0083	0.0405	0.21	

Note. * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$

Table 12

Final Hierarchical Linear Models Assessing Main Hypothesis for Behavioral Aggression Factor and Attitudes Towards Aggression: Level-2 Predictors of Individual Aggression at Time 2

Measure and Level-2 predictors	Coefficient	*SE*	t test
Behavioral Aggression Factor			
For intercept β_{0j}			
Intercept γ_{00}	-0.0181	0.0402	-0.45
Group aggression Time 1 γ_{01}	0.4524	0.0401	11.28***
Group gender γ_{02}	-0.1691	0.0841	-2.01*
Group gender X Group Aggression γ_{03}	-0.1161	0.0857	-1.36
For intercept β_{1j}			
Intercept for Individual Aggression γ_{10}	0.8439	0.0351	24.05***
For intercept β_{2j}			
Intercept for individual position in group γ_{20}	0.0264	0.0420	0.63
Group Aggression Time 1 γ_{21}	0.0799	0.0387	2.06*
Group gender γ_{22}	0.0561	0.0947	0.59
Group gender X Group aggression Time 1 γ_{23}	0.1017	0.0849	1.20
Attitudes Towards Aggression			
For intercept β_{0j}			

Intercept γ_{00}	1.7032	0.0324	52.63***
Group aggression Time 1 γ_{01}	0.4970	0.0899	5.53***
Group gender γ_{02}	-0.2242	0.0794	-2.82**
Group gender X Group aggression Time 1	0.0067	0.1896	0.04
γ_{03}			
Intercept for β_{1j}			
Intercept for individual aggression γ_{10}	0.5294	0.0534	9.92***
Intercept for β_{2j}			
Intercept for individual position in group	-0.0512	0.0479	-1.07
γ_{20}			
Group aggression Time 1 γ_{21}	-0.1963	0.1321	-1.49
Group gender γ_{22}	-0.1281	0.0936	-1.37
Group gender X Group aggression Time 1	-0.6960	0.3004	-2.32*
γ_{23}			

Note. *p <0.05, ** p < 0.01, ***p <0.001

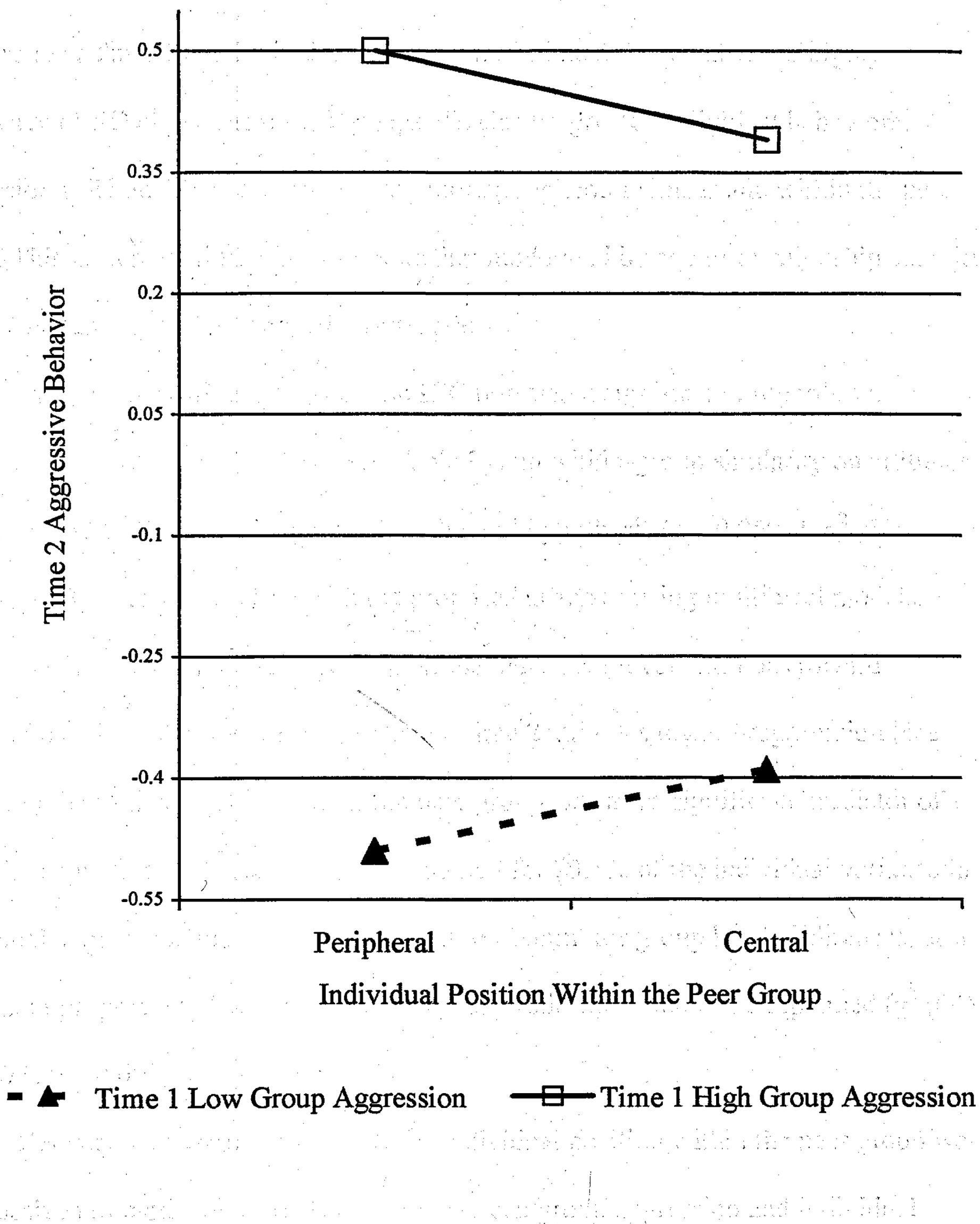

Figure 1. Interaction between individual position within the peer group and Time 1 group aggression predicting Time 2 individual aggression

moderated relation and shows a negative relation between individual position within the peer group at Time 1 and individual aggression at Time 2 for members of highly aggressive (1 SD above the mean) groups. To clarify, greater individual behavioral aggression at Time 2 was associated with more peripheral membership within the peer group. This pattern of findings was not further moderated by age or membership stability.

Self Reported Attitudes Towards Aggression

Fully unconditional model. The ICC revealed a significant proportion of variance between groups (14.69%; see Table 9) and within-group similarity on attitudes towards aggression, allowing me to reject the null hypothesis ($\tau = 0.05921$, $\chi^2(64) = 129.34$, $p < 0.001$) and proceed with the proposed analyses using multilevel models.

Within-group model (Level 1). At the individual level, attitudes toward aggression at Time 1 significantly predicted Time 2 attitudes towards aggression (see Table 11). Individual position within the peer group was not a significant predictor of individual aggression. These analyses accounted for 23.1% of the individual variance in individual aggression and indicated the need to account for group level differences, as a significant proportion of variance between groups still remained to be explained ($\chi^2(64) = 181.71$, $p < 0.001$).

Between-group models (Level 2). Individual position within the peer group was hypothesized to moderate the relationship between group aggression and individual aggression at Time 2, with the direction of the predicted moderated relation differing for the two theoretical perspectives. The proposed model revealed that individual attitudes towards aggression at Time 2 were best predicted by individual attitudes towards aggression at Time 1(γ_{10}), group level aggression (γ_{01}), and group gender (γ_{02}). Like the

findings for behavioral aggression, individuals who had more favorable attitudes toward aggression at Time 2 were initially favorably disposed toward aggression, were in groups that endorsed aggression, and in groups with more boys. A three-way interaction emerged involving position within the peer group, group aggression, and group gender (γ_{23}; see Table 12). This final predictor revealed a positive relation between individual position within the peer group at Time 1 and attitudes toward aggression at Time 2 for individuals within highly aggressive (1 SD above the mean) groups composed primarily of girls. That is, in highly aggressive girls' groups, more favorable attitudes towards aggression at Time 2 were associated with greater centrality within the peer group. Similar findings did not emerge for boys' groups (see Figure 2). This pattern of findings primarily lends support to reciprocal socialization theory.

Age and membership stability. The obtained model was further tested for moderating effects of age and membership stability. No significant effects were obtained for age. Membership stability significantly predicted Time 2 individual attitudes towards aggression (see Table 13). In the final model, membership stability accounted for an additional 1.98% of variance, and increased the fit of the model from the main hypothesis (main hypothesis -2ML= 568.25; adding membership stability to model -2ML= 567.66), while the same pattern of relations found in the main hypothesis remained.

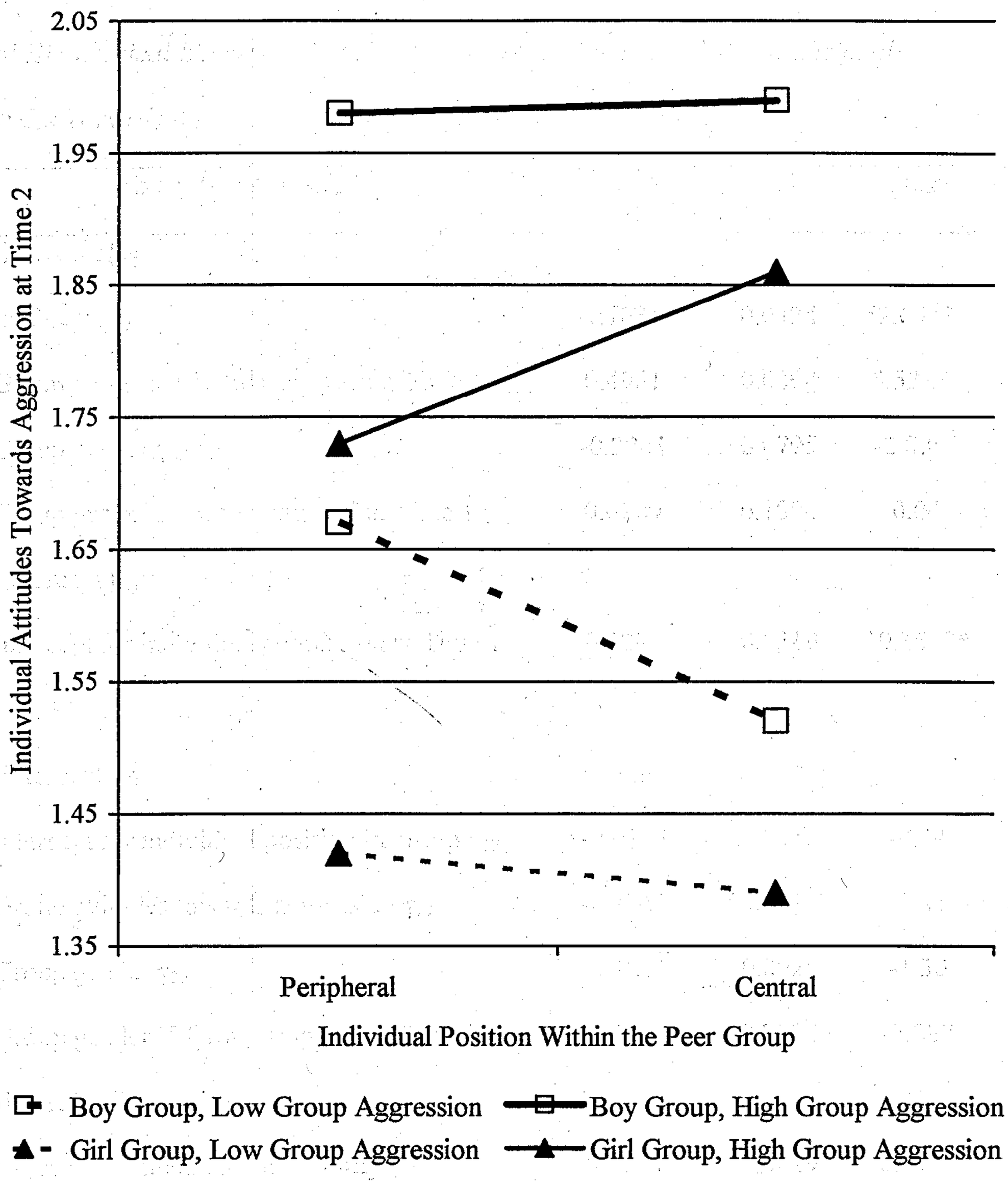

Figure 2. Interaction between individual position within the peer group, group gender, and group attitudes towards aggression at Time 1 predicting Time 2 individual attitudes towards aggression.

Table 13

Final Hierarchical Linear Models For Additional Analyses: Predicting Individual Attitudes Towards Aggression at Time 2 with Membership Stability

Fixed/Random Effect	Coefficient	*SE*	t test
For intercept β_{0j}			
Intercept γ_{00}	1.7031	0.0324	52.65***
Group attitudes towards aggression Time 1 γ_{01}	0.4961	0.0898	5.52***
Group gender γ_{02}	-0.2241	0.0795	-2.82**
Group gender X Group aggression Time 1 γ_{03}	0.0069	0.1894	0.04
For intercept β_{1j}			
Intercept for individual aggression at Time 1	0.5274	0.0519	10.15***
γ_{10}			
For intercept β_{2j}			
Intercept for individual position in group γ_{20}	-0.0193	0.0433	-0.44
Group attitudes towards aggression γ_{21}	-0.1843	0.1311	-1.41
Group gender γ_{22}	-0.1201	0.0925	-1.30
Group gender X Group aggression Time 1 γ_{23}	-0.6815	0.2994	-2.28*
For intercept β_{3j}			
Intercept for membership stability γ_{30}	0.1793	0.0619	2.89**

Note. * $p < 0.05$, ** $p < 0.01$, ***$p < 0.001$

Summary of Findings

The pattern of HLM findings converge on the following points regarding Time 2 aggression. First, group aggression predicts individual aggressive behavior over time. Second, individuals in groups with a greater proportion of boys were more aggressive than those in girl-predominated groups. Third, individual position within the peer group moderates the influence of group aggression for aggressive behavior in a manner consistent with the social identity theory. That is, a negative relation was found between individual position within the peer group and individual aggressive behavior at Time 2, with group members near the periphery of aggressive groups having higher behavioral aggression at Time 2 than members central to the group. Fourth, individual position within the peer group moderates the effect of group attitudes toward aggression on individual attitudes toward aggression, but inconsistently across groups composed of more or less girls. Within aggressive peer groups consisting predominantly of girls, a positive relation emerged between position within the peer group and individual endorsement of aggressive attitudes at Time 2. Specifically, group members who were central to the peer group endorsed more aggressive attitudes than members near the periphery of the group, a finding that supports reciprocal socialization theory. Finally, individuals who stayed in the same peer group were more influenced by their group's attitudes than those who left. I discuss the meaning and implications of these findings in the next section.

Discussion

A finding previously reported in the literature and replicated within the current study is that children in peer groups with aggressive norms tend to become more

aggressive over time (Espelage et al., 2003, Duffy & Nesdale, 2009; Werner & Hill, 2010). To date, the possibility that aggressive peer groups might differentially influence their members has not been considered. The objective of the current study was to determine whether the influence of peer group aggression norms varied as a function of position within the peer group. Two competing theories were examined, one positing that group normative influence would be greatest for central group members due to greater opportunities for reciprocal socialization effects (Cairns et al., 1995), and the other positing that group influence normative influence would be greatest for peripheral members due to their need to demonstrate their allegiance to the group (Hogg, 2005). The results of the current study support both theoretical positions to some extent. In groups with aggressive norms, individual position within the peer group was *negatively* related to individual aggressive *behavior* at Time 2, indicating more aggressive behavior for group members closer to the periphery of the group. This pattern of findings lends support to the social identity perspective. For aggressive *attitudes*, within girls' (but not boys') aggressive groups, individual position within the peer group was *positively* related to individual aggressive attitudes at Time 2. That is, more positive attitudes towards aggression were expressed by group members who were central to the group, supporting reciprocal socialization theory. These findings extend previous work on peer influence by showing that peer group influence is not uniform across group members, but rather varies as a function of children's positions within their peer groups.

Group Norms and Aggressive Behavior Within the Peer Group

Group members who were closer to the periphery of aggressive groups were more behaviorally aggressive than members central to aggressive groups over the academic year. Although the process by which the present findings can be accounted for was not assessed in the current study, social identity theory, and research on aggressive peer groups, combine to create a plausible scenario. Peripheral group members are often disliked by the group, have low status within the group, and are not fully accepted as group members (Hogg, 2005). Within aggressive peer groups, central members are aggressive to other members of the peer group (Closson, 2009), and the brunt of victimization may be taken by peripheral members who are already disliked by other group members and do not fit into the peer group as well as other members (e.g., Juvonen & Gross, 2005). Rather than leave their group, and face possible renewed treatment as a peripheral member of a new group, or be rejected outright, it may be easier for peripheral individuals to adopt the behavioral norms of their current group (Jetten, 2006). Constant surveillance by other group members, may produce relentless pressure to conform to aggressive norms as a sign of loyalty to the group (Short & Strodtbeck, 1974). For these reasons, a peripheral member of an aggressive group may feel compelled to behave aggressively.

Group Norms and Aggressive Attitudes Within the Peer Group

Whereas the social identity perspective provides a good account of aggressive behavior of peripheral group members in aggressive groups, the pattern of findings related to aggressive attitudes seems better accounted for by reciprocal socialization theory, at least for members of mostly female groups. Group members who were more

central to girls', but not boys' aggressive groups showed greater endorsement of aggressive attitudes than members closer to the boundary of the group, presumably at least partly due to their more frequent interaction with aggressive group members.

Recall that the Attitudes Towards Aggression scale assesses attitudes toward overt aggression. Central members of female groups who hold non-gender normative (i.e., favorable) attitudes toward physical aggression may be relatively unique in the child population (Sippola, Paget, & Buchanan, 2007). If favorable attitudes toward physical aggression lead to avoidance by other girls, these girls may endorse aggression as a means of attracting the interest and approval of boys (Olthof & Goossens, 2008). Over time, the reputation associated with "tough girls" may produce increases in social status for leaders of these groups, which further may consolidate their positive attitudes towards aggression. For boys, overtly aggressive behavior is a normative part of male gender roles (e.g., Crick, Bigbee, & Howes, 1996), and endorsing positive attitudes toward aggressive behavior might be especially expected of all male members of aggressive groups. Of course, these interpretations are highly speculative and await further research to confirm.

Differences in Behavior and Attitude for Peripheral Group Members

An unexpected but interesting aspect of the findings was that the relation between group norms and position within the peer group was not consistent for aggressive behavior and attitudes toward aggression. Whereas peripheral children's aggressive behavior exceeded that of central members at Time 2, their attitudes toward aggression were not more favorable than those of central members. Although engaging in aggressive behavior can help peripheral members gain status within their aggressive peer group (e.g.,

Juvonen & Galván, 2009; Moffitt, 1993), behavior does not always reflect private attitudes. Group norms are partially based on the perceptions of what is acceptable behavior within a group and may not necessarily be outwardly discussed by the group members (Aronson et al., 2004). In an aggressive group, if a few members are engaging in aggression but no one stops the behavior even when they know it is wrong, peripheral members can misperceive that other members of the group endorse this behavior, and that to be part of the group they must act in accordance with these perceived norms. The result is a phenomenon known as pluralistic ignorance (Prentice & Miller, 1993), which leads to increased behavior, but not necessarily attitude change. This effect has been observed in the context of deviant behaviors such as drinking (Prentice & Miller, 1993), drug use (Hines, Saris, & Throckmorton-Belzer, 2002), and cheating (Kinal & Ellard, 2008); and is suggested to play a role in peer group bullying (Juvonen & Galván, 2009). Previous research has found that peripheral group members are particularly susceptible to pluralistic ignorance (Reid, Cropley, & Hogg, 2005) precisely because they do not fit in with central members of their peer group, and as a result are likely to misperceive the attitudes of their peers.

It also is possible that peripheral members of aggressive groups attempt to reconcile their discordant attitudes and behaviors by attempting to explain away the inconsistent behavior and values (Olsen & Stone, 2005). For example, children may cite perceived peer pressure or the need to uphold a reputation as the basis for their engagement in aggressive behaviors (e.g., Burns et al., 2008). By making external attributions for aggression (i.e., I participate in aggressive acts against others because my

peer group expects me to), peripheral members can justify their aggressive behavior even when it does not reflect their private attitude towards aggression, and thus reduce cognitive dissonance (Festinger, 1957). Of course, prolonged engagement in aggressive behavior ultimately may lead peripheral group members to more favorable attitudes toward aggression, especially if aggressive behavior leads to greater acceptance by group members over time.

Group Membership Stability and Aggression

Although I had anticipated that children who remained in their groups would evidence greater adherence to aggressive group norms than those who left, group membership stability did not produce this effect. There is some evidence that once children establish a "reputation" for aggression, it is difficult for them to stop behaving aggressively (Burns et al., 2008). Based on interviews with youths, Burns et al. reported concerns that if someone who had a reputation for bullying were to change his or her behavior drastically, it would be "weird," and peers would question the person's motives for the behavior change. Because of these reputation biases, aggressive children may join another (potentially even more) aggressive group after leaving an old group, further encouraging aggressive behavior. As a result, leaving the peer group for a more aggressive peer group or choosing to stay in an already aggressive peer group would not change their behavior. In future research, children who leave their groups should be followed to identify behavioral characteristics of their new groups, their positions within these groups, and the influence of these factors on their subsequent aggressive behavior.

Age Related Effects

In the current study, there was no evidence for a moderation effect of age on the pattern of aggressive behavior within groups. This may indicate that mechanisms of peer group influence affect all children in a similar way across the age-span studied. If younger and older children are equally susceptible to peer group influence, and peripheral group members are most susceptible to behavioral influence, this could be problematic for children who are peripheral members of deviant or aggressive peer groups from a young age. The current findings suggest that these children would be most likely to increase their aggressive behavior over time. This is concerning given that a well-entrenched pattern of aggressive behavior may be difficult to extinguish, especially once children form a reputation for aggression among their peers. Physical aggression is a predictor of early onset conduct disorder (Loeber, Green, Keenan, & Lahey, 1995), which has been found to be highly stable and difficult to treat once it has started (Loeber, 1990).

Theoretical and Practical Implications

Group structure, or hierarchy, is an important feature of peer groups (Rubin et al., 2006). To date, little research has investigated how group structure affects the behavior and attitudes of individual group members. The current research emphasizes that peer group influence is not a uniform process, and that some members within a peer group are more susceptible to group influence than others. Because they need to work harder to gain acceptance into the peer group, peripheral members may change their behavior more than other group members. However, behavior changes are not necessarily reflective of attitudes. Attitude change appears to depend more on frequent interactions among valued peers. When researchers investigate peer group influences on group members, it will be

important for them to consider the role played by the individual in the peer group and how each person is treated by other group members.

The present research has implications for how we approach interventions for bullying and aggression. Given that some individuals are more influenced by peers than others, and this happens in the context of the group, it is important to consider the entire social context when designing interventions. One plausible solution is to change the school setting to allow the emergence of peer groups with diverse norms. For example, in school settings that provide more opportunities for children to embrace their differences (i.e., incorporating school programs that focus on fine arts, technology, sports, academics, and skilled trades) multiple social groups with varying norms are more likely to emerge and conformity to a narrow set of norms may be less likely to occur (Juvonen & Galván, 2009). This remains an area for future research.

At the classroom level, teachers can employ cooperative learning structures as a way to help children avoid aggressive groups by providing access into other peer groups with different norms. In these situations, teachers place students together in small groups to work towards a common goal and receive recognition based upon the team's performance (Slavin, 1980). For example, one type of cooperative learning structure is the "jigsaw" which calls upon each team member to develop an area of expertise to aid in completing an assignment (Felder & Brent, 2007). Cooperative learning has been found to promote social skills, self-esteem, feelings of community within the classroom (Felder & Brent, 2007), and positive peer relationships (Roseth, Johnson, & Johnson, 2008). As a result, children are not only given chances to build upon their strengths, but are exposed

to a greater diversity of peers; potentially providing exposure to new social partners for children who would prefer to interact with non-aggressive peers.

Limitations and Future Directions

Two major limitations of the current study were the short time-span in which the data were collected and the correlational nature of the data. The 6-month span between data collection points may not have been long enough to assess the longevity of the behavioral and attitudinal patterns observed in the present study. Future studies should focus on following individual group members over longer periods to investigate the duration of the behavioral and attitudinal effects of holding a particular position within a peer group. Additionally, these data were correlational in nature and causal assertions regarding the relation between peer group norms and later behavior and attitudes cannot be made with any certainty even though earlier attitudes and behavior were controlled. Future studies employing experimental methods and the manipulation of position within the peer group will be better able to address the antecedents of behavior and attitude change as a result of peer group influence. Although previous experimental work has been carried out with adults (see Hogg & Reid, 2006), few researchers have investigated within-group position as a moderating variable in the context of children's peer groups (for an exception see Duffy & Nesdale, 2010).

The current study is the first to compare reciprocal socialization theory with social identity theory to account for within-group difference in peer group influence on aggression. Much remains to be learned about the processes by which such influence occurs. Extant research has primarily focused on traits that keep central members in high-

status positions (e.g., Rodkin et al., 2000; Hawley, 2007) and only at one particular point in time. Less is known about how peer group members in general, and peripheral members in particular, influence each other and are influenced by their peer group over time. Although research on adults (e.g., Hogg, 2005; Jetten, 2006) has looked at what life might be like for a peripheral member of an adult group or organization, no research has investigated what it is like to be a peripheral member of a child or adolescent peer group. Observational research is needed to investigate how these children are treated by group-mates on a daily basis and to investigate the socialization processes that underlie behavioral and attitudinal change. Qualitative work (e.g., observation, interview) is required to reveal the experiences of peripheral group members, how they cope with life on the periphery of the peer group, and how these experiences affect their long-term well being.

In the present study, I have shown for the first time that the influence of aggressive peer groups on group members' behavior is differential and likely occurs through social identity and reciprocal socialization processes. Building on findings produced by Ellis and Zarbatany (2007), who found that some peer groups are more influential than others, I have shown that some group members are more subject to peer group influence than others. Thus, it would appear that peer group influence is more nuanced than was previously thought. It remains for future research to identify the specific psychological, social, and behavioral mechanisms that combine to induce attitude and behavior change in central and peripheral group members.

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Appendix A

Recruitment Speech and Invitation to Participate in Research

Hi everyone, my name is (name) and this is (name) and we're students from the University of Western Ontario. Does everyone know about Western? That's the school where people our age go. We're here today to ask you if you would like to participate in a research project that we're doing that involves several hundred children around London. The project is about kids—about how they think about themselves and others, and how they play and work together.

If you decide to be in our project, we will ask you to fill out two surveys here in your class. The first one will happen in a few weeks and the second one happen close to the end of the year. In these surveys, we will ask you a bunch of questions about how you feel about yourself and others, how you feel about school, how you normally act with other kids, who your friends are, and who you hang out with at school. There are no right or wrong answers to these questions—it's not like a test—we're just interested in what you think.

We'll also ask you to get together with some of your friends to play some games and work on some fun problems together, and we'll videotape you while you do this. This will happen here at your school, sometime after the Christmas holiday. We'll study the videotapes later to learn about how kids play and solve problems together.

Does anyone have any questions so far about what we'd like you to do?

You don't have to do this project if you don't want to. If you decide you want to do the project, and then change your mind, you can stop any time—just let us know. If you don't want to answer some questions on the survey, you can leave them out. No one will see your answers or your videotapes except for us—we won't show them to the other kids, your teachers, or your parents. We'll keep your answers and your videotapes private.

If you want to be in this project, you need to take this letter home to your parents. They have to read and sign saying that it's OK for you to do it. But everyone should bring back this form, because even if your parents don't want you to do it, the first class in the school to get all the forms back in and signed by their parents will get a pizza party!

If your parents say that it's OK for you to be in the project and you would like to do it, you will get a $10 gift certificate at the very end of the project.

Any questions?

If you want to do our project, please bring your letter back very soon so we can start right away. Thanks, everyone, and see you soon!

Appendix B

Sample Parental Consent Form

KING'S
UNIVERSITY COLLEGE

Western

Information letter and consent form for your child to participate in a research study titled:
Implications of Children's Peer Group Interaction for Social, Psychological and Academic Adjustment

Dear Parent or Guardian,

My colleagues and I, at *The University of Western Ontario* and *King's University College,* are writing to request permission for your child's participation in a research study that we are conducting on the influence of children peer groups on adjustment in childhood. We are inviting students in Grades 4 to 8 from several schools within the Thames Valley District Board of Education to participate. As you know, friends and friendship groups become increasingly important to children as they move from childhood to early adolescence, and friends can have both positive and negative effects. In our study we hope to identify the ways in which peer groups influence children's behavior and adjustment. We are interested in studying how aggressive groups and prosocial/kind peer groups are able to influence the behavior and adjustment of other group members. We believe that this research will help us to identify the ways in which peer groups may help children who are experiencing problems, as well as situations in which children might require assistance dealing with the more negative influence of friends involving peer bullying and aggression.

Our study will begin in the Fall of 2009 and will continue until the end of the academic year. We will ask students to complete a series of questionnaire as a group in their classrooms on two occasions (e.g., once in the fall and again in the spring). We will also ask students to participate in a 45-minute video-taped observational study with their group of friends. All parts of the study will take place at your child's school. To show our appreciation, each child who participates in this research study will receive a $10 gift card for Chapters *or* a local movie theater.

Each questionnaire session will be conducted at times your child's teacher decides are convenient and will take approximately 60-90 minutes to complete. We will read the questions out loud, if necessary, so that all students can follow along. The students will

be asked to identify their school friends and friendship groups, and report their satisfaction with their current friendships. They also will report on their adjustment in several different areas, including self esteem, loneliness, depression, attitudes toward school, problem behavior at school and physical health. We also will ask them to identify students in their grade who have certain behavioral characteristics such as those who are leaders, are helpful to others, start fights, and are picked on by other children. Similarly, your child will be rated by his or her classmates. To obtain additional information about children's adjustment in school, we will ask your child's teacher to report on your child's behavior at school.

At some point after the first questionnaire session, we will ask students to participate in a video-taped interaction with their peer group. These sessions will take place at your child's school during the school day at a times your child's teachers decides are most convenient and will take approximately 45 minutes. Children will be asked to work on several projects with their peer group in 5-10 minute increments. For example, they will be given age-appropriate toys to share for 10 minutes, asked to work on a model-building problem together for 10 minutes and asked to discuss describe their group for 5 minutes.

All information will be kept confidential to the extent permitted by law. Your son or daughter never will be mentioned by name in our reports of our results. All of the questionnaire information and video tapes will be kept confidential and access will be restricted to those researchers directly involved in the project. All information will be destroyed five years after the study is completed.

There are no known risks associated with participation in this study. Participation in this study is completely voluntary and had nothing to do with school performance. Your child may refuse to participate, refuse to answer any questions, or withdraw from the study at any time. You also may withdraw your consent at any time. If you would like to see a summary of the results of this study, please include your address on the attached form and we will send one to you as soon as it is available.

Thank you very much for your consideration. Please fill out the attached form and have your son or daughter return it to his or her teacher. We will be awarding a pizza party to the first class to return all of their forms, *whether or not they agree to participate in the study*. If you have any questions or comments about the study, you are more than welcome to contact me at number listed below. This letter is yours to keep.

Sincerely,

Wendy Ellis, Ph.D
Assistant Professor, King's University College

Xinyin Chen, Ph.D

Professor, The University of Western Ontario

Lynne Zarbatany, Ph.D
Associate Professor, The University Of Western Ontario

PLEASE HAVE YOUR CHILD RETURN THIS FORM TO HIS or HER TEACHER

I HAVE READ THE INFORMATION PROVIDED ABOUT THIS PROJECT AND HAD MY QUESTIONS ANSWERED TO MY SATISFACTION. I VOLUNTARILY AGREE TO ALLOW MY CHILD TO PARTICIPATE IN THIS STUDY.

_____ _____

Your Name (please print) Name of child (please print)

_____ _____

Signature of parent or guardian Date

_____

Signature of child

If you would like a summary of the results of the study, please PRINT your name and address below. Please provide a permanent address if you anticipate a move within the next year or two.

_____

_____

_____

_____

*OR **I do not wish** to have my child* _____ *participate* ☐
(Name of child)

Appendix C

General Instructions

DIRECTIONS TO READ TO PARTICIPANTS AT BEGINNING

This survey asks questions about your behaviors, feelings and thoughts. We also ask you about who your friends and groups are, and we'll ask you to pick kids who would be good in different roles in a play.

Please take your time reading the questions and thinking about your answers. Read the instructions for each section and each questions carefully. Think about what each question is asking you and how you feel about each question.

It is REALLY important that your answers are honest- we want them to reflect how you actually feel- your true thoughts and feelings- not how you think we want you to answer. Remember, all of your answers are PRIVATE. Your names are not on the surveys, and no parents or teachers will see your answers. So, you can be 100% honest. When you finish the survey, it will go into a computer database which the researchers will look at it as a large group. We really want to stress how important it is that you answer HONESTLY and on your own, without the help of any of your friends or classmates. Doing this survey has NOTHING to do with your school marks in any class.

Please answer as many of the questions as possible. We appreciate you doing the survey but if you don't feel comfortable about answering a question, you can leave it blank. We don't want you to answer a question that you feel uncomfortable about answering.

If you have a question during the survey please put up your hand and one of us will try to answer your question. Although **there are no right or wrong answers**, we'd like you to treat this survey like you would a test. That means you do not talk to the person next to you, and you should always keep your eyes on YOUR survey.

When you finish the survey please raise your hand.

Today we will be using special scantron sheets for your survey. These will be scanned by a computer. You must use a pencil for this survey, no pens please. Also, please answer your questions by filling in the bubble, there is no need to fill it in perfectly and you may go outside the lines (demonstrate on board). But remember if you want to change your answer please use an eraser- don't just cross it out. Also, do not mark or draw anywhere on the page! On the bottom of the very last page where it says ID number you may print your name.

DEBRIEFING (AFTER THE SURVEY)

I would like to THANK YOU for doing this survey. We really appreciate that you answered the questions, and gave us your time and attention today. I know some of the questions were personal, so thank you for answering honestly. If you are upset, or thinking about any of the questions we asked and you want someone to talk to about them, a teacher is a really good person to go to. We'll be back in a few months to have you work with your classmates- see you then!