

Relational and Physical Aggression, Prosocial Behavior, and Peer Relations Gender Moderation and Bidirectional Associations

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In this 3-year prospective study (N = 458) spanning a transition to middle school, bidirectional associations between children's relations with schoolmates (social preference and impact) and behaviors (physical and relational aggression, prosocial behavior) were examined using structural equation modeling. Gender moderation of all estimated paths was examined. There was no gender difference in relational aggression in Grade 3; girls were more relationally aggressive than boys in Grade 6. Males were more physically aggressive than females; females were more prosocial and preferred by peers. Longitudinal and bidirectional associations between relations with peers and behaviors were found. Compared to one-group models of social preference and impact, gender moderation models improved model fit significantly. With regard to social preference and children's behaviors, gender moderated concurrent, but not longitudinal, associations. With regards to social impact and children's behaviors, gender moderated both concurrent and longitudinal associations. There was moderate stability of behaviors, including relational aggression.

Keywords: *relational aggression; peer relationships; gender differences; prosocial behavior; longitudinal design*

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Relationships among children, and children's reputation and status in the peer group, are important for social and emotional development. Being held in positive regard by peers has been associated with future social competence and relatively fewer behavioral problems (Hymel, Rubin, Rowden, & LeMare, 1990). Furthermore, in numerous studies, peer rejection has been consistently associated with later individual maladjustment, such as learning difficulties, poor academic achievement, loneliness and depressive symptoms in childhood, and mental health problems and criminality in adolescence and adulthood (see Coie, Dodge, & Kupersmidt, 1990 and Parker & Asher, 1987 for reviews).

Because children's status with their peers is one of the most robust indicators of maladjustment, both cross-sectional and prospective studies have been conducted to investigate why some children and adolescents are more preferred by peers than other children (e.g., Cillessen, Bukowski, & Haselager, 2000; Coie & Dodge, 1983). In particular, researchers have focused on whether children's own behaviors predict acceptance and rejection by peers (e.g., Coie, Dodge, & Coppotelli, 1982; Coie, Lochman, Terry, & Hyman, 1992; Parke et al., 1997). Convincing evidence has emerged showing that children's physically aggressive behaviors are predictive of rejection by the peer group (Newcomb, Bukowski, & Pattee, 1993).

It is not yet clear whether earlier children's behaviors influence their relationships with peers after the transition from childhood to adolescence and the transition to a new school environment. Few longitudinal studies of behavior and peer relationships have followed children as they make these transitions. This is an important question to address as the progression from childhood into early adolescence is a time marked by significant change in the nature and form of peer groups (B. B. Brown, 1990) and friendships (Berndt & Keefe, 1995). Concurrent changes in the biological, cognitive, and social domains characteristic of entry into adolescence can mark a time when peer relations become increasingly important for support and when a variety of problem behaviors can emerge or escalate (Caspi, Lynam, Moffitt, & Silva, 1993; Lerner & Galambos, 1998; Zimmer-Gembeck, Siebenbruner, & Collins, 2001). Similarly, the transition to middle school has been reported as

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difficult for some children; there have been reports of declining self-conceptions, confidence, and school achievement (see Eccles, Wigfield, & Schiefele, 1998, for a review; Skinner, Zimmer-Gembeck, & Connell, 1998) as well as increases in depression, especially among girls (Nolen-Hoeksema, 2001; Hankin & Abramson, 2001; Prinstein & Aikins, 2004; Rudolph & Asher, 2000).

Peer Status and Children's Behaviors

One key objective of this 3-year longitudinal study was to examine bidirectional associations between children's behaviors in Grade 3 and their peer status after the transition to middle school. Certain behaviors often place children at risk for poor relations with peers, and in turn, these problems or successes with peers may exacerbate problem behavior or undermine the development of prosocial behaviors. For example, physically aggressive behavior among young boys has been associated with maintaining rejected peer status during a 1-year period, and peer rejection in kindergarten has been associated with physically aggressive behavior in Grade 2 after accounting for the boys' earlier aggressive behavior (Cillessen, van Ijzendoorn, van Lieshout, & Hartup, 1992; Dodge, 1993). Hence, bidirectional associations between peer status and children's behaviors were expected in the current study. We estimated the influence of children's earlier behaviors on their middle school standing in the peer group and, simultaneously, examined converse associations to determine if children's earlier peer status influenced behaviors in middle school.

Bidirectional associations between peer status and children's behavior were expected across this 3-year period. Cillessen and colleagues (Cillessen et al., 2000) reviewed the individual and group mechanisms by which social experiences can exert influence on behavior over time and across a school transition. They emphasized the different learning opportunities for accepted versus rejected peers in terms of the ongoing information they receive about their social skills and the ability to practice and benefit from the modeling of these social skills by peers with whom they affiliate (see also Hartup, 1983). Others (Crick & Ladd, 1993; Rudolph & Clark, 2001) have also described how views of the self in peer relationships may develop from experiences of peer rejection or acceptance. Compared to children, adolescents' self-views in the domains of social appeal and skills are very important and may be over-emphasized (Harter, 1999). By early adolescence, interactions with peers are likely to become consistent with the positive (Rabiner & Coie, 1989) or negative (Coie, 1990) views of self and peers that have developed in earlier years. For example, in a 3-year longitudinal study of adolescents, there was evi-

dence that withdrawal (measured as social disengagement) had an influence on later self-views, and reciprocally, negative relational self-views were associated with later withdrawal from peers (Caldwell, Rudolph, Troop-Gordon, & Kim, 2004).

Peer Status, Children's Behaviors, and Gender

A second key objective of this study was to investigate gender differences in associations between peer status and children's behaviors (gender moderation). Physical and relational aggression and prosocial behavior were the behaviors examined.

Children's behaviors and gender. Most studies of peer status and children's behavior have identified low peer status with classmates, such as rejection, as a correlate of physical forms of aggression, especially among males (e.g., Bierman & Wargo, 1995; Cillessen et al., 1992). However, beginning at about age 4, physical aggression has been found to be more common among males than females (Hood, 1996; Parke & Slaby, 1983), so studies have often included only boys (e.g., Bierman & Wargo, 1995; Cillessen et al., 1992). This focus on physical forms of aggression and exclusion of girls has resulted in less knowledge about behaviors that may lead to girls' social difficulties or success with peers. Furthermore, approximately one half of boys who are rejected are not physically aggressive (Bierman & Wargo, 1995; French, 1988), and the association between peer rejection and physical aggression declines as children get older (Franzoi, Davis, & Vasquez-Suson, 1994). Therefore, in addition to physical aggression, relational aggression and prosocial behavior were measured in the current study to expand the study of children's behavior, peer status, and gender.

Relational aggression. Relational aggression involves "behaviors that harm others through damage (or threat of damage) to relationships or feelings of acceptance, friendship, or group inclusion" (Crick, 1996b, p. 77). For example, relational aggression includes the use of social exclusion to harm others (Crick, 1996b; Crick & Grotpeter, 1995). Although physical aggression tends to be stable or decline during late childhood and adolescence (Loeber & Hay, 1997), relational aggression and related behaviors have been found to increase around early adolescence (about age 11 through 12; Cairns, Cairns, Neckerman, Ferguson, & Gariépy, 1989). As desires for intimacy and exclusivity in relationships increase from late childhood to early adolescence (B. B. Brown, 1990; Furman & Buhrmester, 1992; Parker & Asher, 1993), some young people may increasingly use relationally aggressive strategies

rather than physical aggression to harm others or influence their relationships. In past studies of early adolescents, relational aggression has been more common than physical aggression, and relational aggression has been associated with poorer peer relationships (Crick, 1996b; Rys & Bear, 1997). For example, in a 6-month longitudinal investigation of children in Grades 3 to 6 (Crick, 1996b), relational aggression was associated with increases in peer rejection, especially for girls, even after accounting for the influence of physical aggression.

Prosocial behavior. There have been recent appeals to expand the study of peer interactions by placing more emphasis on positive behaviors during the transition into adolescence (Carlo, Fabes, Laible, & Kupanoff, 1999; Fabes, Carlo, Kupanoff, & Laible, 1999). A link has been established between prosocial behavior and peer acceptance, with prosocial children being more accepted by their peers (Asher & Coie, 1990). Given this association and the age-related increases in prosocial behaviors that have been found, particularly for females in early adolescence (Fabes et al., 1999), longitudinal associations between peer relationships and positive social behaviors also were examined in the current study.

Social preference and social impact. Social preference and social impact were the measures of peer status in the current study. Researchers have provided evidence for the distinction and independence of social preference and impact measures (Coie et al., 1982; Newcomb & Bukowski, 1983; Peery, 1979). Social preference has been referred to as a measure of likability and peer acceptance, whereas social impact has been referred to as a measure of prominence and visibility in the peer group (Schneider, 2000). Recent qualitative (Adler & Adler, 1995) and quantitative (Bukowski, Sippola, & Newcomb, 2000; Pellegrini, 1995) investigations have shown likability, dominance, and prominence in the peer group becoming increasingly salient in adolescence after a transition to middle school. In the current study, social preference and social impact were examined as two salient and separate aspects of children's peer group relationships.

Gender moderation hypotheses. Based on empirical findings, we expected that gender would moderate associations between peer status and children's behaviors. First, the association between physical aggression and social preference was expected to be greater among males than females. Multiple studies, especially studies of boys, have reported negative associations between physical aggression and peer social preference (see Newcomb et al., 1993, for a review).

Second, associations between relational aggression and social preference and between relational aggression and social impact were expected to be stronger for girls than for boys. With regards to peer preference, we expected that engagement in relational aggression in Grade 3 will be associated with lower peer preference in early adolescence because these behaviors can violate the emphasis on trust that is becoming more salient and characteristic of peer relationships during this transitional period (Bigelow & La Gaipa, 1975). Yet previous research findings have shown that relational aggression is associated with lower peer preference for girls (but not for boys), after physical aggression was taken into account (Crick, 1996b; Rys & Bear, 1997). Earlier relational aggression was also expected to be associated with greater social impact in early adolescence as there is evidence that one motivation for relational aggression may be to increase dominance and prominence in the peer group (Werner & Hill, 2003). A recent study found associations between relational aggression and social impact among girls (Lease, Kennedy, & Axelrod, 2002). Using a combination of reports of who is popular and who is liked, girls who were popular but not as well liked were more relationally aggressive. It appears that relationally aggressive girls can have more social impact in the peer group but be less preferred when compared to girls who are less relationally aggressive (Crick & Grotpeter, 1995; Geiger, Zimmer-Gembeck, & Crick, 2004). However, overall, we did anticipate that relational as well as physical aggression would have independent effects on later social preference and impact for both genders. It was unclear whether the converse associations (i.e., earlier peer status associated with later aggression) would be found during this age period.

Finally, we expected bidirectional associations between peer status and prosocial behavior; earlier prosocial behavior would predict later peer status, and earlier social preference and impact would be associated with prosocial behavior by early adolescence. We expected these associations to be stronger among females as compared to males. These hypotheses are consistent with theory regarding the importance of children's social experience with peers for the development of positive social behaviors (Hartup, 1983). Prosocial behavior has been noted to increase in adolescence, particularly among females and may be more important for the developing peer status of girls as compared to boys (Fabes et al., 1999).

Three-Year Stability of Peer Status and Children's Behaviors

In addition to examining the associations between peer status and children's behaviors and the moderation of these associations by gender, a final

aim of the current study was to examine the stability of social preference, social impact, and children's behaviors across a 3-year interval spanning entry into adolescence and a middle school environment. A particular interest was in the 3-year stability of relationally aggressive behavior. Stability and change in peer status have been examined in previous studies, but it is uncommon for studies to span a school transition. Prior to the school transition in childhood, 1- and 2-year stabilities of social preference and social impact have ranged from .46 to .52 and .29 to .41, respectively (Terry & Coie, 1991). Many studies of physical aggression (see Coie & Dodge, 1998, for a review) report high stability regardless of the time span, but there is less information on the stability of relational aggression and prosocial behavior. To our knowledge, only one previous longitudinal study of 6-month duration included relational aggression and prosocial behavior (Crick, 1996b), and this study did not span the transition into adolescence and a new school environment.

Analytical Strategy

The analytical strategy used in the current study was cross-lag autoregressive path modeling (Curran, 2000). We used structural equation modeling to test lagged associations between children's behaviors and later social preference and impact. We also simultaneously tested associations between earlier social preference and impact and later behavior. Concurrent associations between measures in Grade 3 and Grade 6, and the 3-year stability of all measures were simultaneously estimated. Two-group models (male and female) were initially tested.

METHOD

Participants

Children participated in sociometric assessments in their classrooms in Grades 3 (T1) and 6 (T2). A total of 2,335 children (49% females) in 95 classrooms participated at T1. Children primarily lived in urban and suburban areas of the upper Midwestern U.S. Most children were Caucasian (46%) or African American (24%). Remaining children had a variety of ethnic and racial backgrounds including Hmong or other Asian, Native American, and Hispanic.

The longitudinal sample for this study consisted of 464 children who completed assessments at T1 and T2. Six children did not report their gender

and were excluded from all analyses leaving a final sample size of 458 (53% female). Most children (95%) in the longitudinal sample were attending sixth grade in a middle school.¹

To determine sample representativeness, we compared characteristics of the longitudinal sample to children who participated at T1 only. There were no group differences in mean levels of peer rejection, peer impact, physical aggression, and relational aggression. Yet there were a few group differences, and all were small in magnitude excepting racial and ethnic background. Children in the longitudinal sample were just slightly more preferred by their peers (longitudinal sample mean = .09, $SD = 1.0$; T1 only sample Mean = $-.02$, $SD = 1.0$; $F[1, 2332] = 4.7$, $p = .03$, $d = .11$) and slightly more prosocial (longitudinal sample mean = .22, $SD = 2.6$; T1 only sample mean = $-.05$, $SD = 2.4$; $F[1, 2332] = 4.7$, $p = .03$, $d = .11$). Children included were slightly more likely to be female ($\chi^2 = 5.0$, $p < .05$, $\phi = .05$) and less likely of a racial and ethnic background other than Caucasian or White, 74% Caucasian or White in the longitudinal subsample vs. 59% Caucasian or White among other children ($\chi^2 = 160.3$, $p < .001$, $\chi^2 = -.27$). These racial and ethnic differences in the longitudinal and T1 only samples primarily occurred because middle schools with higher proportions of White students were more likely to agree to research participation.

Procedure

Peer nominations were collected in Grades 3 and 6. All students who returned parent consent forms participated. The parental consent rate was just more than 70%. Students were given candy and small school-related gifts prior to and after participation. Two research assistants were present for assessments. One assistant was responsible for highlighting portions of instructions such as confidentiality, discouraging students from discussing items with their classmates, telling students that talking to their parents about the research was not discouraged, and reading survey items to the students. The second assistant was available to help individual students. Children were supplied with alphabetized rosters of their classmates and nomination forms. Each child on a roster was assigned an identification number. Students used identification numbers to nominate three classmates (male or female) for each item.

Because groups of Grade 3 students spent all day together in the same classroom, peer nomination rosters included all children within single class-

rooms. In Grade 6, 96% of participants have moved to a middle school environment. Follow-up data were collected within houses for most (92%) of these students. In the large middle schools recruited for this study, children were assigned to houses, which were smaller groups of students (about 100 to 150) who attended different classes together in a segment of the school. In these schools, all students in the house were included on peer nomination rosters. For the remaining students who attended middle schools that were smaller in size (8%), peer nomination rosters included all children in Grade 6. Measures were completed in the spring of each year of assessment to allow children to have a chance to become familiar with other students prior to data collection.

Measures

Social preference and impact. Students nominated the three classmates they liked most and the three classmates they liked least. Peer acceptance scores for each child were calculated by summing liked most nominations. Peer rejection scores for each child were calculated by summing liked least nominations. Following procedures developed in past research (Coie et al., 1982; Crick, 1996b), scores were then standardized within classrooms (or houses) to adjust for unequal group sizes. Social preference and social impact scores were computed as acceptance score minus rejection score and acceptance score plus rejection score, respectively, and standardized. Hence, social preference is the extent to which children are liked versus disliked by peers (assessed as peer acceptance minus peer rejection), whereas social impact reflects a child's visibility in the peer group (assessed as peer acceptance plus peer rejection) (Schneider, 2000).

Most researchers have relied on one of two methods to assess children's status with peers. The first, a nomination method, was used in this study. An alternative method is a liking-rating method, where children rate each of their schoolmates on a single item usually ranging from 1 (*dislike very much*) to 5 (*like very much*). The liking rating method yields an average rating score for each child that can range from 1 to 5. Social preference scores based on the nomination method have been highly correlated with liking rating scores (*r*s ranged from .77 to .90 depending on whether nominations were limited in number or unlimited; Bukowski, Sippola, Hoza, & Newcomb, 2000). Additionally, stabilities of scores from nomination methods and liking rating methods have been similar in previous studies (Terry & Coie, 1991).

Children's aggression and prosocial behavior. Nomination procedures developed in past research (Crick, 1997) were used to assess physical aggression, relational aggression, and prosocial behavior. As part of classroom (or house) assessments, students nominated their classmates on a series of behavioral items. All items were standardized within classrooms (or houses) before summing to construct subscale scores. The physical aggression scale contained three items: "classmates who hit, kick, or punch others at school," "kids who push and shove others around," and "kids who tell others that they will beat them up unless kids do what they say." The relational aggression scale contained five items, including "kids who try to make another kid not like a certain person by spreading rumors about them or talking behind their backs"; "kids, who when they are mad at a person, get even by keeping that person from being in their group of friends"; "people who, when they are mad at a person, ignore the person or stop talking to them"; "kids who let their friends know that they will stop liking them unless the friends do what they want them to do"; and "people who try to exclude or keep certain people from being in their group when doing things together (like having lunch in the cafeteria or going to the movies)." The prosocial behavior scale contained three items, including "people who say or do nice things for other classmates," "kids who help others join a group or make friends," and "people who try to cheer up other classmates who are upset or sad about something."

Physical and relational aggression measures have been shown to have high interitem correlations, with Cronbach's α ranging from .94 to .97 for the Physical Aggression subscale and .82 to .89 for the Relational Aggression subscale (Crick, 1995, 1997; Crick & Grotpeter, 1995; Grotpeter & Crick, 1996). Factor analysis of physical and relational aggression items has confirmed the existence of two separate factors, both with eigenvalues greater than 1.0 and high factor loadings (ranging from .73 to .91) and insubstantial cross-loadings (Crick & Grotpeter, 1995). Furthermore, the correlation between physical and relational aggression subscales has been shown to be moderate ($r = .54$ to $.57$) (Crick & Grotpeter, 1995; Grotpeter & Crick, 1996). Prosocial behavior has also been reported to have high reliability (Crick, 1996b). In the current study, average internal reliabilities across the two waves of assessment were high: .95 for physical aggression, .88 for relational aggression, and .89 for prosocial behavior. As will be seen later, correlations between physical and relational aggression were similar to or somewhat higher in the current study than in past research, r s ranged from .46 to .73 depending on age and gender.

RESULTS

Distributions of Variables

As expected when measuring a relatively uncommon phenomenon, physical and relational aggression scores were not normally distributed. Because a substantial percentage of participants received low numbers of nominations for physical aggression (about 20% received 0 nominations), distributions of physical aggression measures were significantly positively skewed. Measures of relational aggression and prosocial behavior also had moderate positive skewness with about 10% of participants receiving zero nominations in each case. Social preference scores had distributions with slight negative skew (slightly more participants had positive scores rather than negative scores). The distributions of social impact scores did not significantly depart from normality. A constant was added (to account for negative and zero values) to measures with a distribution that significantly departed from normality and natural log transformations were conducted. Transformations produced distributions that fell within the acceptable range for normally distributed variables (Curran, West, & Finch, 1996). Analyses were repeated using transformed measures and the pattern of significant findings was identical to results with untransformed measures. Hence, we reported results using untransformed measures as they lend themselves more readily to meaningful interpretation.

Gender Differences, and the Association Between Social Preference and Social Impact

Gender comparisons are shown in Table 1. In Grades 3 and 6, girls were more preferred by peers than boys, and boys had slightly more social impact than girls in Grade 6. Females were more prosocial than males, whereas males were more physically aggressive than females. No significant gender difference was obtained in relational aggression in third grade, but by sixth grade, females were significantly more relationally aggressive than boys.

Social preference and social impact scores were not significantly associated in Grade 3, $r = .05, p > .05$. These two scores had a relatively modest but significant correlation in Grade 6 ($r = .11, p < .05$). Given the low correlations, the next sections present results of models fit to data on social preference separate from data on social impact.

TABLE 1: Gender Differences in Children's Behaviors, Social Preference, and Social Impact in Grades 3 and 6

	Grade 3				Grade 6				
	Males		Female		Male		Female		
	M	SD	M	SD	M	SD	M	SD	
Relational aggression	.41	3.7	-.20	3.5	-0.04	3.9	.75	4.7	3.8*
Physical aggression	.88	2.8	-.79	1.8	1.20	3.5	-.98	1.6	75.4**
Prosocial behavior	-.59	2.0	.97	2.8	-.90	1.9	1.31	2.9	91.0**
Social preference	-.05	1.9	.36	0.9	-.07	1.1	.22	0.8	9.1**
Social impact	.12	0.9	-.03	0.9	.15	1.0	-.04	0.9	4.4*

NOTE: Male $n = 211$, Female $n = 247$.

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

Overview of Remaining Data Analyses

We estimated models using structural equation modeling (e.g., Jöreskog & Sörbom, 1993; Kaplan, 2000). We used structural equation modeling to estimate and account for (a) correlations between constructs measured concurrently in Grades 3 and 6 and (b) stability in children's behavior, social preference (Model 1), and social impact (Model 2) from Grades 3 through 6, prior to estimating longitudinal (cross-lag) associations between children's behaviors and social preference or impact. Our primary interest was in gender differences in cross-lag associations between children's behaviors in Grade 3 and social preference and impact in Grade 6. Hence, two-group models were estimated in which all paths were freed so that different path coefficients were allowed to be estimated for males and females. We refer to this as a gender moderation model.

The fit of models was assessed with commonly used indices including the χ^2 -test statistic and associated level of significance, the Comparative Fit Index (CFI; Bentler, 1990), the Normed Fit Index (NFI; Bentler & Bonett, 1980), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993). The CFI and NFI are considered acceptable if above .9, but values above .95 are considered indicative of good fit (Kaplan, 2000). RMSEA values below .05 are considered acceptable, values between .05 and .08 are considered indicative of fair fit, and values between .08 and .10 are considered an indication of mediocre fit (Kaplan, 2000). Another measure of fit that has been proposed is the χ^2 -test statistic divided by the degrees of freedom. There are various proposals about what value represents a good fit but ratios of two or three have been suggested (Bollen, 1989).

To develop the model of social preference, we examined all possible associations between T1 measures (children's behaviors and social preference in Grade 3) and the same T2 measures in two steps. In Step 1, longitudinal stabilities (e.g., the association between relational aggression at T1 and relational aggression at T2), all model paths between constructs measured concurrently (e.g., the path between relational and physical aggression in Grade 3), and all possible cross-lag paths linking children's behaviors and social preference were estimated. In Step 2, we eliminated all cross-lag path coefficients that were not significantly different from 0 for males or females. To test the social impact model, these two steps were repeated replacing social preference scores with social impact scores.

Although these gender moderation models estimated different path coefficients for males and females, further analyses were needed to determine whether the models, as a whole, were significantly different for males compared to females. Hence, we next estimated the same two structural models

developed in the previous steps but fixed all path coefficients to be equal for males and females. We compared the fit of each of these one-group models to the associated gender moderation model. It was expected that gender moderation models would fit the data significantly better than one-group models. If so, this indicated that gender moderated associations between children's behavior and social preference or impact, or construct stabilities. Further analyses were then needed to determine which specific path coefficients were moderated by gender.

To identify the specific path coefficients that were moderated by gender, we started with a gender moderation model, constrained one path (either a path between constructs measured concurrently in Grade 3 or 6, a cross-lag path or a stability coefficient) to be equal (i.e., not differ) for males and females and compared the fit of this model to the fit of the gender moderation model. If there was a significant difference in the fit of the two models under examination, as determined by the χ^2 -difference test, we concluded that gender moderated the particular path under examination. These analyses and the comparison of models were completed once for each path coefficient estimated in both models. In sum, the following analyses involved the estimation of two gender moderation, and two one-group models (i.e., one of each for social preference and social impact) and an examination of all significant ($p < .05$, one-tailed) path coefficients for potential gender moderation.

Social Preference

Comparison of the gender moderation and one-group models. The gender moderation model of social preference fit the data quite well, $\chi^2(16) = 30.1$, $p = .02$; CFI = .99, NFI = .98, RMSEA = .04, $\chi^2/df = 1.9$. The χ^2 -difference test indicated that the gender moderation path model fit the data significantly better when compared to a one-group model (i.e., when all paths were constrained to gender equality); $\chi^2 = 132.3$, $p < .01$; CFI = .93, NFI = .91, RMSEA = .08, $\chi^2/df = 3.7$, χ^2 -difference test (20) = 102.2, $p < .01$

Concurrent associations between children's behavior and social preference, and gender moderation. In Grade 3, all children's behaviors and social preference scores were significantly intercorrelated for males and females (Table 2).² Aggressive behavior was negatively associated, and prosocial behavior was positively associated with social preference for boys and girls. In Grade 6, children's behaviors and social preference were intercorrelated with only one exception for boys and three exceptions for girls. In Grade 6, relational aggression was not associated with prosocial behavior in either

TABLE 2: Path Coefficients Between Children's Behaviors and Social Preference (Model 1) for Males and Females in Grades 3 and 6, and Results of Tests of Gender Moderation

	1	2	3	4
1. Relational aggression		.55, .46	-.26, -.11	-.30, -.11
2. Physical aggression	.73, .66		-.32, -.15	-.29, -.06
3. Prosocial behavior	-.34, -.10	-.36, -.13		.60, .45
4. Social preference	-.39, -.33	-.27, -.24	.47, .33	

NOTE: Path coefficients estimated for males are below the diagonal. Female path coefficients are above the diagonal. The first path coefficient in each cell is the association between constructs assessed in Grade 3. The second path coefficient is the association between constructs assessed in Grade 6. All path coefficients greater than $|.12|$ are significantly different from 0 ($p < .05$). Bold identifies significant ($p < .05$) gender differences in path coefficients; gender differences were determined with χ^2 -difference tests comparing a model with the path constrained to gender equality to a model with all path coefficients free to differ for males and females. Male $n = 211$. Female $n = 247$.

gender, and relational and physical aggression scores were not significantly associated with social preference among females.

Bold text in Table 2 indicates path coefficients that were moderated by gender. Gender moderated two of the paths between constructs measured in Grade 3, and four paths between constructs measured in Grade 6. In Grade 3, the positive association between relational and physical aggression was stronger for boys than girls, and the positive association between prosocial behavior and preference was weaker among boys than girls. In Grade 6, the gender differences identified in Grade 3 remained, and in addition, the negative associations between relational aggression and social preference and between physical aggression and social preference were stronger among boys than girls.

Cross-lag associations between children's behavior, social preference, and gender moderation. Figure 1 summarizes cross-lag associations between children's behaviors and social preference. The four cross-lag associations that were significant among one or both genders are shown in Figure 1. One child behavior in Grade 3, relational aggression, was negatively associated with later social preference, and this association was only significant among girls. Conversely, social preference in Grade 3 predicted children's behaviors within Grade 6. Children who were more preferred in Grade 3 were less often nominated as relationally (only significant among males) and physically aggressive and more often nominated as prosocial in Grade 6. As can be seen in Table 3, gender did not moderate any of the four significant cross-lag paths in this model. Therefore, although the magnitude of

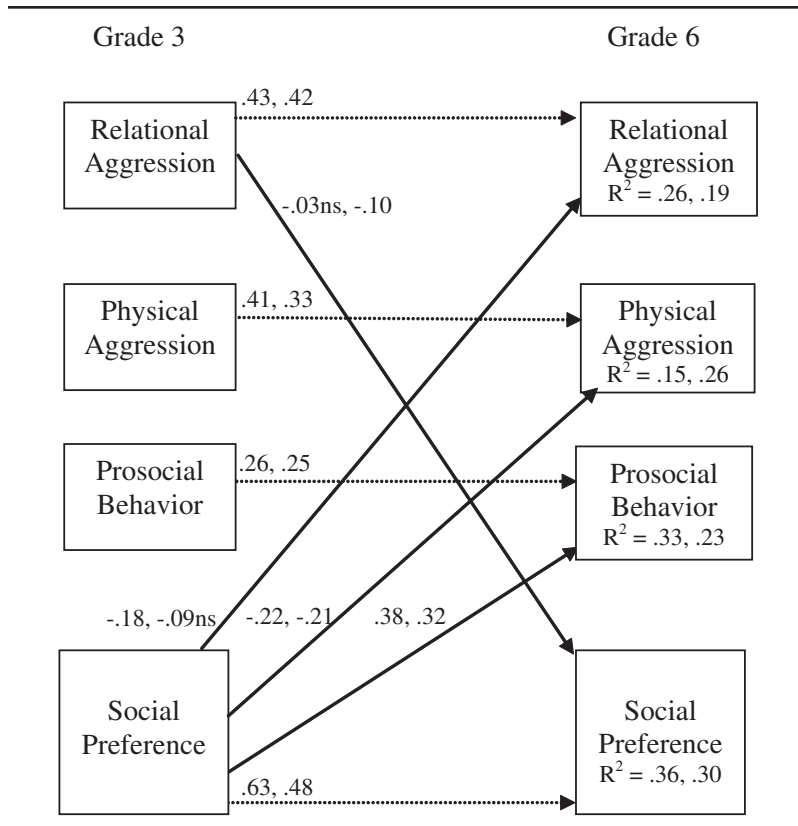


Figure 1: Final path model of children's behaviors and social preference.
 NOTE: All path coefficients were freed to differ for boys and girls. The first coefficients shown are estimates for boys. The second coefficients are estimates for girls. ns = not significant.

path coefficients for males and females differed slightly, and at times a path was significant for only one gender, these were not significant gender differences.

Finally, to assess gender moderation of cross-lag paths further, a model was estimated in which only cross-lag paths were freed to differ for males and females (i.e., within-grade correlations were fixed to be equal for males and females). This model did not fit the data significantly better than the one-group model, $\chi^2(32) = 123.9, p < .01$; CFI = .93, NFI = .91, RMSEA = .08, $\chi^2/df = 3.9$, χ^2 -difference test(4) = 8.4, $p > .05$. Hence, there was no improvement in model fit over a one-group model when we constrained concurrent

TABLE 3: Results of Tests of Gender as a Moderator of Significant Cross-Lag Path Coefficients

<i>Model 1: Social Preference</i>			
<i>Grade 3 Predictor</i>	<i>Grade 6 Outcome</i>	$\chi^2(17)^a$	χ^2 Difference (from 30.1)
Relational aggression	Social preference	30.7	0.6
Social preference	Relational aggression	30.7	0.6
Social preference	Physical aggression	32.4	2.3
Social preference	Prosocial behavior	31.0	0.9
<i>Model 2: Social Impact</i>			
<i>Grade 3 Predictor</i>	<i>Grade 6 Outcome</i>	$\chi^2(15)^a$	χ^2 Difference (from 44.2)
Relational aggression	Social impact	48.3	4.1*
Physical aggression	Social impact	48.7	4.5*
Prosocial behavior	Social impact	44.3	0.1
Social impact	Relational aggression	47.9	3.7
Social impact	Physical aggression	49.2	5.0*

NOTE: Model 1 $\chi^2(16) = 30.1$ when all path coefficients were free to differ between males and females. Model 2 $\chi^2(14) = 44.2$ when all path coefficients were free to differ between males and females.

a. χ^2 test statistic when the path was constrained to equality for males and females. $^*\chi^2(1)$ is significant ($p < .05$) indicating gender moderated the cross-lag association.

paths and stabilities to be the same for boys and girls while allowing the estimation of different cross-lag path coefficients. In sum, these findings show that it was primarily gender moderation of within-grade correlations, not cross-lag paths, which accounted for most of the improvement in the fit of the gender moderation model as compared to the one-group model.

Social Impact

Comparison of the gender moderation and one-group models. The gender moderation model of social impact fit the data fairly well, $\chi^2(14) = 44.2$, $p < .01$; CFI = .97, NFI = .96, RMSEA = .07, $\chi^2/df = 3.2$. In addition, the χ^2 -difference test indicated that the gender moderation model fit the data significantly better when compared to a one-group model (i.e., when all paths constrained to gender equality); $\chi^2(35) = 151.9$, $p < .01$; CFI = .90, NFI = .87, RMSEA = .09, $\chi^2/df = 4.3$, χ^2 -difference test(21) = 107.7, $p < .01$.

TABLE 4: Path Coefficients Between Children's Behaviors and Social Impact (Model 2) for Males and Females in Grades 3 and 6, and Results of Tests of Gender Moderation

	1		2		3		4	
1. Relational aggression			.55	.47	-.26	-.13	.19	.34
2. Physical aggression	.73	.67			-.32	-.21	.12	.19
3. Prosocial behavior	-.34	-.19	-.36	-.23			.31	.35
4. Social impact	.37	.33	.29	.12	.07	.22		

NOTE: Path coefficients estimated for males are below the diagonal. Female path coefficients are above the diagonal. The first path coefficient in each cell is the association between constructs assessed in Grade 3. The second path coefficient is the association between constructs assessed in Grade 6. All path coefficients greater than |.12| are significantly different from 0 ($p < .05$). Bold identifies significant ($p < .05$) gender differences in path coefficients; gender differences were determined with χ^2 -difference tests comparing a model with the path constrained to gender equality to a model with all path coefficients free to differ for males and females. Male $n = 211$. Female $n = 247$.

Concurrent associations between children's behavior and social impact, and gender moderation. In Grade 3, all children's behaviors and social impact scores were significantly intercorrelated for boys and girls with the exception of prosocial behavior and social impact for boys and physical aggression and social impact for girls (Table 4).³ In Grade 6, with the exception of physical aggression and social impact among boys, children's behaviors and social impact were significantly intercorrelated. When significant, both aggressive and prosocial behaviors were positively associated with social impact.

Bold text in Table 4 indicates path coefficients that were moderated by gender. Gender moderated all concurrent paths between children's behaviors and social impact in Grade 3, and the concurrent association between prosocial behavior and social impact in Grade 6. In Grade 3, the positive association between relational aggression and social impact, and the positive association between physical aggression and social impact were stronger among boys than girls. The positive association between prosocial behavior and impact was weaker among boys than girls in both Grade 3 and Grade 6.

Cross-lag associations between children's behaviors, social preference, and gender moderation. Five cross-lag associations shown in Figure 2, and were significant for one or both genders. In addition, three cross-lag paths were significantly moderated by gender (see Table 3). Physical aggression in Grade 3 predicted social impact only among boys, whereas relational aggression in Grade 3 predicted later social impact only among girls. Prosocial

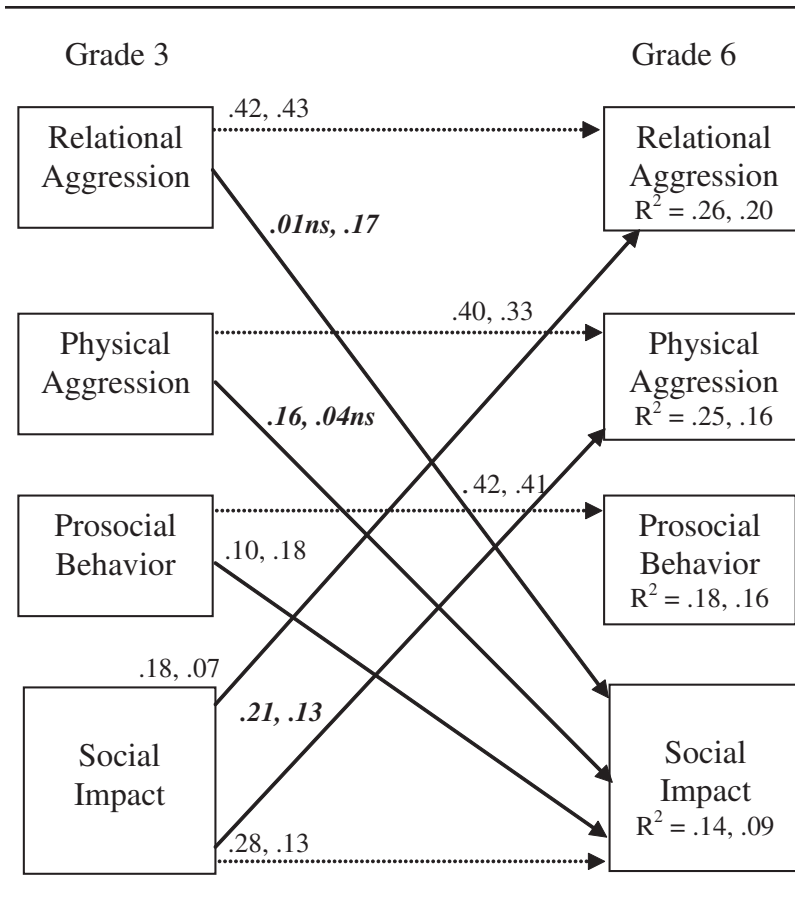


Figure 2: Final path model of children's behaviors and social impact.
 NOTE: All path coefficients were freed to differ for boys and girls. The first coefficients shown are estimates for boys. The second coefficients are estimates for girls. Coefficients that differed for boys compared to girls are shown in italics and bold. ns = not significant.

behavior in Grade 3 was positively associated with social impact in Grade 6 for boys and girls.

Conversely, children with higher social impact scores in Grade 3 were more often nominated as aggressive in Grade 6, but the path coefficient between impact in Grade 3 and relational aggression in Grade 6 was not significant for girls. Additionally, the influence of social impact on later physical aggression was significant and stronger among boys than girls.

TABLE 5: Results of Tests of Gender as a Moderator of Stabilities of Children's Behaviors, Social Preference, and Social Impact

<i>Model 1: Peer Preference</i>	$\chi^2(17)^a$	χ^2 Difference (from 30.1)
Relational aggression	30.1	0.0
Physical aggression	37.1	7.0*
Prosocial behavior	30.2	0.1
Social preference	33.1	3.0
<i>Model 2: Peer Impact</i>	$\chi^2(15)^a$	χ^2 Difference (from 44.2)
Relational aggression	44.3	0.1
Physical aggression	48.2	7.0*
Prosocial behavior	44.6	0.4
Social impact	46.4	2.2

NOTE: Model 1 $\chi^2(16) = 30.1$ when all path coefficients were free to differ between males and females. Model 2 $\chi^2(14) = 44.2$ when all path coefficients were free to differ between males and females.

a. χ^2 test statistic when the path was constrained to equality for males and females.
 $\chi^2(1)$ is significant ($p < .05$) indicating gender moderated the cross-lag association.

To assess gender moderation of cross-lag paths further, a social impact model was estimated in which only cross-lag paths were freed to differ for males and females. This model did not fit the data significantly better than the one-group model, $\chi^2(30) = 143.4$, $p < .01$; CFI = .90, NFI = .88, RMSEA = .09, $\chi^2/df = 1.9$, χ^2 -difference test(5) = 8.5, $p > .05$. As was found with the social preference model, compared to a one-group model, there was no improvement in model fit when we constrained the within-grade correlations and stabilities to be the same for boys and girls, while allowing the estimation of different cross-lag path coefficients for boys and girls. Although there were some cross-lag paths moderated by gender, these gender differences in paths were not large in magnitude, and most of the improvement in fit of the gender moderation model was because of gender moderation of within-grade correlations.

Three-Year Stability of Children's Behaviors, and Social Preference, and Impact

Stability coefficients estimated for males and females are shown in Figures 1 and 2. Table 5 summarizes model χ^2 tests when each stability path was constrained to be equal for males and females, and χ^2 -difference tests comparing the fit of each model to the fit of the gender moderation model. All stabilities were significantly greater than 0 and small to moderate in magnitude.

Physical aggression was significantly more stable for boys than girls, but no other gender difference in stabilities was found.

DISCUSSION

Researchers have identified some of the correlates of peer status, and this work has revealed the significant role of peer reputation in the social development of children. However, few empirical investigations have had the opportunity to examine the independent effects of boys' and girls' physical aggression, relational aggression, and prosocial behavior on social preference and impact from childhood to early adolescence. Evidence exists concerning the negative influence of physical aggression on peer status, but the present investigation illustrated the additional importance of relational aggression and prosocial behavior as well as the gender of the child when explaining children's concurrent and future status with peers. Despite the stringent tests of cross-lag associations conducted in the current study, bidirectional influences between children's behaviors and peer relations were found. Not only do children's aggressive and prosocial behaviors predict future peer relations, but the balance of being liked and disliked by classmates is important for shaping future aggressive and prosocial behaviors when interacting with peers.

Bidirectional Cross-lag Associations Between Children's Behavior and Peer Relations

The use of structural equation modeling to test path models made it possible to examine these bidirectional associations between children's behaviors and social preference or impact. Considering all cross-lag paths examined here, bidirectional influences between children's behaviors and peer relations do occur. Nevertheless, there appeared to be somewhat more influences of earlier peer relations on children's later behaviors than vice versa.

Social preference. Peer social preference, where high scores indicate being highly liked and rarely disliked by others and low scores indicate the opposite, seemed to have a greater influence on children's later physical aggression, relational aggression, and prosocial behaviors rather than vice versa among both boys and girls. Preference scores in Grade 3 predicted all later behaviors among boys and all behaviors with the exception of relational aggression among girls. These results concur with other evidence (Coie et al., 1990; Crick, 1996b; Farmer & Rodkin, 1996) that positive peer experiences

are important for learning appropriate social skills such as negotiating conflict and helping others (e.g., Hartup, 1983) as well as indicating that the lack of these opportunities may be detrimental to interactions with schoolmates (Parker & Asher, 1987).

Although developmental theorists have discussed how children's status with their peers potentially influence their future behaviors, such as aggression and prosocial behavior (Hartup, 1983; Parker & Asher, 1987), with a few exceptions (e.g., Dishion, Patterson, Stoolmiller, & Skinner, 1991; Kupersmidt, Burchinal, & Patterson, 1995), fewer empirical studies have focused on children's behaviors as influences on later peer status. When these converse longitudinal links between children's behavior and later social preference were investigated in the current study, there was limited influence of earlier behaviors on later social preference scores after accounting for stabilities and concurrent associations between all constructs. Only relational aggression in Grade 3 was linked to later social preference, and this association was significant only among girls. However, although some path coefficients were significant among boys only or girls only, gender did not moderate any cross-lag paths in this model indicating no significant gender differences in the magnitude of these path coefficients.

Social impact. Compared to the model of social preference, bidirectional effects were more numerous when conducting analyses of peer social impact, where high scores indicate a higher level of like and dislike by peers and low scores indicate lower levels of like and dislike by peers. Furthermore, there was evidence of gender moderation here; the three cross-lag paths that were moderated by gender were found when social impact was examined. In general, findings of gender moderation supported a gender normative hypothesis with behaviors more commonly associated with boys (physical aggression) linked to later social impact for boys and behaviors more commonly associated with girls (relational aggression) linked more strongly to later social impact for girls. Gender normative aggressive behaviors appear to be having an affect on status with other children at the transition from childhood to early adolescence. Gender did not moderate the path from earlier prosocial behavior to later social impact. Prosocial behavior had a positive and similar influence on later social impact for both boys and girls.

Conversely, social impact in Grade 3 also predicts children's aggressive behaviors in Grade 6. Earlier social impact is associated with increasing physical aggression for all children and relational aggression among boys only. Yet the association between earlier social impact and later physical aggression is stronger among boys compared to girls. Peers are increasingly noticing children with relatively more negative or positive behaviors, and this

recognition seems to play a role in maintaining and escalating children's, especially boys', aggressive behaviors.

Aggression, peer status and gender. Although previous research has consistently found negative associations between physical aggression and rejection and acceptance by peers (see Newcomb et al., 1993, for a review), when both physical and relational aggression are considered, the current findings show that it is girls' relational aggression, and not physical aggression, that predicts both social preference and impact 3 years later. In contrast, bidirectional associations between social impact and physical aggression were stronger among boys as compared to girls. Additionally, the associations between earlier social preference and impact and later relational aggression were significant among boys, but not girls. Together, findings suggest that aggression may partly escalate among boys between Grades 3 and 6 as a reaction to their peer experiences rather than vice versa. Girls may use relational aggression for reasons other than as a response to their peer status, such as gender socialization or arising from their greater focus on dyadic friendship interactions (L. M. Brown, Way, & Duff, 1999; Crick, 1996a; Crick, Bigbee, & Howes, 1996). In other words, girls' relational aggression emerges and, in turn, affects their peer status; boys' aggression may be more of an outcome of their peer status and associated peer experiences. However, this interpretation of the findings is speculative as some model paths differed in magnitude between boys and girls but were not significantly moderated by gender.

Concurrent Associations and Gender Moderation

We should also briefly note that gender moderated many concurrent (within Grade 3 or within Grade 6) associations between children's behaviors and peer relations in the current study. It was these concurrent correlations that primarily resulted in the need for models with different path coefficients for boys and girls. For example, relational aggression and physical aggression co-occurred among boys and girls, but this was more likely among boys than girls. Thus, boys who have the highest physical aggression scores are often the same boys who have the highest relational aggression scores. However, the correlation between relational and physical aggression was not as strong for girls, indicating that these two forms of aggression do not as strongly covary among girls. These findings indicate that it continues to be important for researchers interested in aggression and gender to include separate assessments of relational and physical aggression.

In general, the behaviors of boys and girls and their social preference and impact scores were intercorrelated in both Grade 3 and Grade 6. Gender did

moderate associations between prosocial behaviors and peer status, with prosocial behavior more important to social preference and impact for females. This is consistent with previous research that has found that prosocial behavior is more important to girls' acceptance by peers than boys' acceptance (Crick, 1996b). It is still unclear why this occurs. However, children may simply attend to and expect prosocial behavior from girls, as it is consistent with gender stereotypes. On the other hand, other social behaviors may be more salient when considering the likability of boys, but these factors are yet to be clearly identified.

As anticipated, gender moderation was also found when examining aggression. Yet these findings were more age related and complex than we had hypothesized. Among males, aggression (physical and relational) was consistently associated with social preference and impact in both Grade 3 and Grade 6. Among females, the impact of physically and relationally aggressive behaviors on their peer status changed with age. Aggressive behaviors were increasingly reflected in girls' peer social impact scores (like and dislike scores combined) rather than only in lower peer social preference scores (like scores net of dislike scores). These findings are supportive of other evidence that aggression can be associated with social dominance and liking by some peers, and dislike by other peers, especially in early adolescence. For example, Crick and Grotpeter (1995) found that relationally aggressive children (in Grades 3 to 6) are more likely than nonrelationally aggressive children to be classified as controversial (highly liked and disliked by others). Others (Henington, Hughes, Cavell, & Thompson, 1998; Salmivalli, Kaukiainen, & Lagerspetz, 2000) have reported that relational aggression is associated with higher status with some peers, especially in adolescence. Relational aggression may be increasingly used as a strategy to gain and keep friends at this time of heightened peer interactions (e.g., see Adler & Adler, 1995). Additionally, physical aggression in early adolescence, especially by boys, has been found to maintain or gain status with some peers (Adler & Adler, 1995; Pellegrini, 1995).

Stability of Children's Behaviors and Peer Relations

A final objective of this investigation was to examine the 3-year stability of all constructs with particular focus on relational aggression and girls. It was clear that children's early social behavior, including relational aggression, and reputations established with classmates tend to accompany children into early adolescence even after they change schools and classrooms. In fact, stabilities of physical aggression and peer status were similar to those reported in studies that did not include a school transition (see Coie & Dodge,

1998; Schneider, 2000, for reviews). In the current study, social preference scores were somewhat more stable than impact scores, but there was moderate 3-year stability in physical aggression, relational aggression, and prosocial behavior. Yet physical aggression was more stable among boys than girls.

Peer status is generally stable over time and across settings (Coie & Dodge, 1983), even with direct efforts to change peer status through social interventions (Bierman, Miller, & Stabb, 1987; La Greca, 1993). Our findings are consistent with evidence suggesting that individual factors (e.g., aggressive behavior) and group processes may be at work that maintain the effects of social experiences across a transition to a new setting and new peer group (e.g., Cillessen et al., 2000; Parker & Asher, 1987).

Gender Differences and Relational Aggression

There have recently been questions regarding whether relational aggression is more prevalent among females or males (for reviews on this topic see Geiger et al., 2004; Underwood, Galen, & Paquette, 2001). The current study findings regarding relational aggression by gender and age are important to consider in conjunction with these questions. We found that gender differences in levels of relational aggression differed depending on children's age. There was no gender difference in relational aggression among third grade children (about age 9); however, by sixth grade (about age 12), girls were more relationally aggressive than their male peers. Findings are consistent with that of Bjoerkqvist and colleagues (Bjoerkqvist, Lagerspetz, & Kaukiainen, 1992) who reported that gender differences in indirect aggression did not occur until about age 10. However, because girls have been found to be more relationally aggressive than boys as early as preschool (Crick & Grotpeter, 1995; see Geiger et al., 2004, for a review; Lagerspetz, Bjoerkqvist, & Peltonen, 1988), firm conclusions await further research.

Study Limitations

One potential limitation of this study is the changing location of peer nominations from the classroom in grade school (Grade 3) to the house or grade in middle school (Grade 6). The finding of similar stability of children's behaviors and peer status in this study and studies completed without a school transition indicate that this change was appropriate. The location of peer relations do change from grade school, where children spend most of their day in a single classroom, to middle school, where children change classrooms through-

out the day and increasingly interact with larger numbers of individuals who are not in a single class.

Second, this study relied on each student nominating three schoolmates for all assessments rather than using unlimited nominations or ratings by all participants. As an alternative to peer nominations, which identify those children who are more extreme in their behavior, some researchers prefer peer ratings where the distribution of scores can be less positively skewed (Schneider, 2000). Yet the social preference scores used here provided a continuous measure that has been found to be highly correlated with a ratings-based measure (Bukowski, Sippola, Hoza, et al., 2000) but also reduced the assessment burden on children. Furthermore, most children did receive some nominations. Nevertheless, the measures of social preference and impact used in this study may not have provided the most accurate measures of the peer status of children who do not engage in more distinct levels of aggression or prosocial behavior. This study should be interpreted in combination with those that used alternative methods, such as peer ratings or self-report.

Relatedly, gender differences in relational aggression may depend on the measurement techniques used at different ages (e.g., peer nominations, observations). Gender differences in relational aggression are sometimes found when using observational or teacher report measures but not as often found when using peer nominations (Crick, Casas & Ku, 1999b; Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996; Russell, Hart, Robinson, & Olsen, 2003). The current studies relied on one reporting source: classmates. This may have resulted in slightly inflated associations. Future research using multiple reporters of information might allow a determination of the impact of the source of data on study findings.

Summary and Conclusion

In sum, there are bidirectional longitudinal links between children's positive and negative social behaviors and their status in the peer group even when the moderate stabilities of children's behaviors and peer status, and concurrent associations, were taken into account. Gender was a moderator of concurrent associations between children's behavior and peer relations in childhood (Grade 3) and early adolescence (Grade 6) and also moderated a few longitudinal associations between children's behaviors and social impact in the peer group. These findings suggest that analyses should be done separately for males and females (or interactions should be examined) to provide the most accurate accounts of associations between aggressive and prosocial behaviors and peer status. It is important to consider gender, rela-

tional aggression, and prosocial behavior in addition to the more commonly studied behavior of physical aggression when investigating stability and change in peer status during childhood and adolescence. Furthermore, differential results across the two gender-moderation models presented here indicate the importance of examining both social preference and social impact as distinct constructs. Doing so allowed a more complete understanding of the age-related and gendered interface between children's positive and negative behaviors when interacting with peers and schoolmates' perceptions of others as liked or disliked members of the group.

NOTES

1. Students transitioned to a wide range of middle schools for Grade 6 with large numbers of new classmates. Permission from each middle school was required to gather data in Grade 6 making it difficult to follow all children assessed at T1. Permission was received from 19 middle schools with 1,981 children completing T2 assessments (described further in the Procedures section below). Some children remained in elementary schools resulting in classroom-based T2 assessments of 301 children in nine elementary schools. The rate of parental consent in Grade 6 was 68%. However, most (80%) of these children had not participated at T1.

2. These path coefficients were quite similar to simple Pearson correlation coefficients between constructs measured in Grade 3 and between constructs measured in Grade 6. Hence, simple correlations are not presented but are available on request.

3. See Note 2.

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