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Aggression By Whom—Aggression Toward Whom: Behavioral Predictors of Same- and Other-Gender Aggression in Early Childhood

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Abstract

This study assessed girls' and boys' dominance-related behaviors (aggressive, commanding, submissive, and neutral behaviors) as they naturally occurred during interactions with male and female peers and evaluated the possibility that such behaviors elicit aggression from peers. Using a focal observational procedure, young girls' and boys' ($N = 170$; 54% boys) naturally occurring dominance-related behaviors and male and female peers' aggressive responses to those behaviors were recorded multiple times each week across the academic year. Findings suggested that same-gender aggression occurred at similar rates as other-gender aggression once tendencies toward gender segregated play were controlled. Additionally, there were both gender-based similarities and differences in children's use of dominance-related behaviors in peer interactions and as antecedents for peers' aggression. The findings have implications for the literatures on aggression and gendered peer interactions.

Keywords

Aggression; Victimization; Social Dominance; Gender

Children's tendency to be aggressive toward peers (or aggressed against by peers) depends, in part, on their gender. Indeed, there is differential likelihood for being involved in aggression for girls and boys beginning early in life (Baillargeon et al., 2007; Card, Stucky, Sawalani, & Little, 2008). Studies of gender and aggression have largely focused on the gender of the focal child (either aggressor or victim) without specifying the gender of other members in the aggressive interaction or relationship. Such studies, however, may not effectively capture the variations that might occur among girls' and boys' same- and other-gender aggressive interactions. Children interact with, and are aggressive toward, both same- and other-gender peers (Crick et al., 2006; Ostrov & Keating, 2004; Smith & Green, 1975). But, their interaction patterns with same-gender peers vary in nature and quality from their interaction patterns with other-gender peers, and the gender of children's peers impacts their behavior over and above effects due to children's own gender (Fabes, Martin, & Hanish, 2003; Maccoby, 1998; Martin & Fabes, 2001). Thus, there is reason to believe that

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there is variation in the behavioral interaction patterns that typify girls' and boys' same- and other-gender aggression.

We addressed this issue in the present study by considering whether the behavioral antecedents of peers' aggression depended upon the gender pairing of the aggressor and victim. Building on Olweus' (1978) work with adolescent boys, researchers have suggested that aggressive and submissive behaviors impact children's risk for peers' aggression by demonstrating to peers where that child falls on the social dominance hierarchy and by signaling the expected value and outcome of aggressing against that child (Coie, Dodge, Terry, & Wright, 1991; Hawley, Little, & Card, 2008; Pellegrini, Roseth et al., 2007; Rodkin & Berger, 2008; Roseth, Pellegrini, Bohn, Van Ryzin, & Vance, 2007). Yet, such behaviors may not occur equally among girls and boys or within same- and other-gender peer interactions. Moreover, such behaviors may have different meanings depending on the gendered social context. For example, girls' and boys' interactions with same- and other-gender peers have been found to vary on such dimensions as the tendency to behave in competitive and domineering versus conciliatory ways, the use of and responsiveness to direct and indirect forms of social influence, the tendency to use verbal and nonverbal communications, and the likelihood of expressing intense affect (Leaper & Smith, 2004; Leman, Ahmed, & Ozarow, 2005; Maccoby, 1998; Miller, Danaher, & Forbes, 1986; Rose & Rudolph, 2006; Serbin, Sprafkin, Elman, & Doyle, 1982). Thus, aggressive and submissive behaviors, as well as other dominance-related behaviors, may differentially impact the likelihood that girls and boys will receive aggression from male and female peers.

The primary goals of the present study were to assess young girls' and boys' dominance-related behaviors as they naturally occurred during interactions with male and female peers and to evaluate the degree to which such behaviors impact the likelihood of being aggressed against by those peers. We focused on dominance-related behaviors (i.e., aggression, commands, and submission) that are relevant to antagonistic or coercive forms of control because prior work has highlighted these behaviors as key predictors of peers' aggression and their generalizability across gender lines is largely unknown (e.g., Coie et al., 1991; Olweus, 1978; Schwartz, Dodge, & Coie, 1993). Moreover, because neutral behaviors may be implicated in aggression, particularly when peers interpret seemingly neutral behavior as aggressive (Dodge, 2006), we also considered the degree to which neutral behaviors antecede peers' aggressive responses. The behavioral antecedents of peers' aggression were explored using a sample of preschoolers with two developmental considerations in mind: (1) studies of the predictors of peer aggression are less common at early developmental periods as compared to later developmental periods, and (2) children's early aggressive peer interactions set the stage for their later aggressive peer interactions. Thus, there is a need to understand the early emergence of aggressive peer interactions.

Same- and Other-Gender Aggression in Early Childhood

Gender segregation is frequently seen in children's peer interactions and relationships (see review in Martin, Fabes, & Hanish, 2010). Because affiliation with same-gender peers constitutes a significant portion (about 60%) of young children's social lives at school (Fabes et al., 2003; Martin & Fabes, 2001), it stands to reason that aggression might occur most often with same-gender peers. In fact, sexual selection theory posits that aggression should occur more often among same-gender peers than among other-gender peers because it may be used to obtain power and access to resources within gender-based dominance hierarchies (Geary, Byrd-Craven, Hoard, Vigil, & Numtee, 2003; Pellegrini, Roseth et al., 2007).

Indeed, there is some evidence that aggression is directed to same-gender peers during early childhood, although these findings are mixed. For instance, Smith and Green (1975) found that, among preschoolers, aggression between two boys occurred more frequently than aggression between two girls or aggression between a boy and a girl (which occurred at similar rates). However, Pellegrini, Roseth, and colleagues (2007) reported that same-gender aggression occurred more frequently than mixed-gender aggression for both girls and boys. In studies that have addressed this issue considering physical, relational, and verbal forms of aggression, mixed results have also been reported. Crick and her colleagues (2006) found that girls were more likely to direct relational aggression to other girls and that boys were more likely to direct physical aggression to other boys. But, there was no same-gender preference for boys' use of relational aggression or for girls' use of physical aggression. In another study, Ostrov (2006) reported a same-gender preference for girls' use of relational aggression, boys' use of relational aggression, and boys' use of physical aggression, but not for girls' use of physical aggression. However, in each of these studies, time spent with same-and other-gender peers was not directly controlled, making it possible that these effects were due, at least partly, to the amount of time children spent in gender-segregated interactions. When gender-segregated interactions were controlled, the same-gender bias for aggression appears to be weaker. For instance, Ostrov and Keating (2004) covaried time spent with male and female peers and found that preschool boys and girls were similar in directing relational and verbal aggression to both male and female peers, but they differed in that boys directed more physical aggression to male than to female peers, whereas girls directed physical aggression to males and females equally. Clearly, aggressive behavior is not confined solely to same-gender peers. Thus, variations according to the gender-based targeting of aggression need to be accounted for in models of aggressive behavior.

Gender Variations in the Behavioral Risk Factors for Peers' Aggression

Current knowledge about the behavioral predictors of peers' aggression builds on earlier work by Olweus (1978) and others (Coie et al., 1991; Olson, 1992; Schwartz et al., 1993), which focused largely on boys. Bolstered by sexual selection theory and the idea that aggressive behaviors may be used to influence one's own or others' relative status positions and to control valuable resources or opportunities compared to same-gender peers, it has been argued that behaviors that signify one's position in the dominance hierarchy are key predictors of peers' aggressive responses (Adler & Adler, 1995; Hawley, Little, & Card, 2007; Pellegrini, 2008). This argument seems particularly relevant to boys given the robust evidence that dominance hierarchies are central to boys' play groups in early childhood and beyond (Geary et al., 2003). For instance, many of the gender-typed social behaviors that young boys exhibit, such as their tendencies to engage in active, competitive, and physically rough peer interactions, are those that contribute to their positions in dominance hierarchies (Fabes et al., 2003; Maccoby, 1998; Martin & Fabes, 2001; Pellegrini, Long, Roseth, Bohn, & Van Ryzin, 2007). Moreover, among relatively young children, boys' aggressive behaviors elicit aggressive responses from peers (Coie et al., 1991; Olson, 1992). Furthermore, boys' passive or submissive behaviors, which represent relatively low status in the dominance hierarchy, have also been shown to predict aggressive peer responses—at least in middle childhood and beyond (Schwartz et al., 1993). It is less clear, however, whether such behaviors are associated with boys' risk for peer aggression in early childhood (Alsaker & Valkanover, 2001; Hanish et al., 2004).

Much less work has specifically considered whether girls' likelihood of receiving peer aggression is similarly influenced by dominance-related behaviors and whether the patterns are the same as or different from those seen for boys. Maccoby (1998) argued that the gender segregation that is often seen in children's interactions and relationships is such a prominent feature of their social worlds that it promotes distinct peer cultures in which girls'

and boys' behavioral and interactional styles diverge. Substantial evidence supports the idea that there are gender differences in interactional patterns, beginning early in childhood, and that increased affiliation with same-gender peers results in greater gender-typed behavior (Martin & Fabes, 2001). Indeed, girls' play styles are different from those of boys in that they tend to be more quiet, sedentary, dyadic, and oriented toward verbal interactions that promote relationships (Fabes et al., 2003; Maccoby, 1998; Rose & Rudolph, 2006). Thus, the dominance-related behaviors that are characteristic of boys' interactions with other boys are less central and appealing in girls' interactions with other girls (Geary et al., 2003; Maccoby, 1998). These findings might suggest that the factors that contribute to girls' receipt of peer aggression differ from those that contribute to boys' receipt of peer aggression. However, Pellegrini (2008) has speculated that girls should be as responsive to dominance-related behaviors as boys. A handful of studies of preadolescent and adolescent girls support this idea. For instance, Hawley and her colleagues (2008) have demonstrated that girls who are relatively high in social status may use aggression, and Adler and Adler (1995) have described the functional use of aggression to maintain the social structure of girls' groups. Additionally, Benenson and colleagues (2006) found that 6- to 15-year-old girls reported that they would respond aggressively to aggressive peers, particularly within the context of close relationships. However, the extent to which dominance-related behaviors are specifically predictive of girls' aggression is not well understood, particularly in early childhood.

There has also been relatively little attention paid to whether and how dominance-related behaviors might differentially explain same- and other-gender aggression in early childhood. Because social dominance models have been greatly influenced by evolutionary psychology and the observation that, across species, males and females segregate by gender, they are often applied to explain same-gender behavioral interactions to show how they allow for the development of skills necessary for intrasexual competition (Geary, 1999; Maccoby, 1998; Pellegrini, 2008). Moreover, although less is known about cross-gender than same-gender peer interactions in early childhood, the extant evidence suggests that they are distinct from both typical male-male and female-female interaction patterns and they are more likely to be gender-neutral (Fabes et al., 2003). Perhaps it is for these reasons that studies of behavioral risk factors for cross-gender aggression in childhood are quite rare. However, conceptualizations of adult sexual and partner violence have suggested that dominance motives underlie these forms of cross-gender aggression (Archer, 2009; Jewkes, 2002). Furthermore, in a study of adolescent aggressor-victim dyads, Rodkin and Berger (2008) reported that the social status of aggressors and victims depended on the gender of dyad members, with aggressors having greater popularity than victims in same-gender aggressor-victim dyads but with victims having greater popularity than aggressors in male aggressor/female victim dyads. Thus, examination of the extent to which dominance-related behaviors predict both same- and other-gender peers' aggression at a younger developmental level is greatly needed.

The Present Study

Using naturalistic observational methods, we studied the behavioral antecedents of male and female peers' aggressive responses in a sample of preschool-aged girls and boys. We anticipated gender-based variations in the relations among four specific child behaviors that might be used to represent or manipulate children's positions in the dominance hierarchy. Our focus here was on behaviors that are relevant to antagonistic or coercive forms of control, rather than on affiliative forms of control, given the prominence of such behaviors in the literature on peer-directed aggression (e.g., Coie et al., 1991; Olweus, 1978; Schwartz et al., 1993).

Two potentially antagonistic behaviors were explored: children's own aggression and children's use of commands. Aggressive behaviors are aversive, and numerous studies have shown that aggressive behavior toward a peer often begets an aggressive response from the peer in early childhood (Goldstein, Arnold, Rosenberg, Stowe, & Ortiz, 2001; Hanish et al., 2004; Hanish & Guerra, 2000; Olson, 1992; Patterson, Littman, & Bricker, 1967). Thus, we expected to find evidence that children's own aggressive behavior would directly precede peers' aggressive responses across all gender pairings; however, we hypothesized that aggressive behaviors would be more strongly predictive of male peers' aggression toward other boys (Benenson, Carder, & Geib-Cole, 2008; Coie et al., 1991; Olson, 1992). We also expected that another form of dominance-related behavior—namely, children's attempts to verbally influence peers by issuing commands and directing peers' behavior—would be predictive of peers' aggressive responses. This was expected to be a stronger predictor for girls than for boys, especially for girls' interactions with other girls. Prior research has suggested that direct styles of influence are infrequently used by young girls (as compared to young boys) and are aversive to girls, as reflected in lower rates of peer acceptance (Maccoby, 1998; Sebanc, Pierce, Cheatham, & Gunnar, 2003; Serbin et al., 1982).

Submissive behaviors signify relatively low status on the dominance hierarchy and have been shown to be predictive of male peers' aggression toward other boys (Schwartz et al., 1993). However, this relation may be stronger and more robust in middle childhood and adolescence than in early childhood, perhaps because submissive behaviors are more subtle and thus may be less noticeable and salient to young children than to older, more cognitively developed, children (Alsaker & Valkanover, 2001; Hanish et al., 2004; Younger, Schwartzman, & Ledingham, 1985). Less is known about the role of submission in girls. However, it has been suggested that dominance hierarchies, and one's relative position on the hierarchy, play a more significant role in structuring boys' interactions than girls' interactions (Maccoby, 1998). Thus, submissive behaviors might be less likely to lead to peers' aggression for girls than for boys.

Finally, we also considered children's neutral behaviors as possible antecedents of peers' aggression. Although behavioral studies of the predictors of peers' aggression have rarely considered such behaviors as possible antecedents, social cognitive studies of hostile attribution biases have suggested that neutral behaviors may actually be implicated in aggression, particularly for boys (Dodge, 2006; Feldman & Dodge, 1987). That is, peers may interpret seemingly neutral behaviors as aggressive. For instance, comments such as "we have balloons and you don't" or "I am using the green crayon" or "I want to be first" conveyed in a tone that is neither positively nor negatively valenced may be subtly intended to imply (or interpreted as implying) exclusion from a peer group, threat of lost resources or opportunities, diminished status, or other potentially similar consequences. Thus, it is important to consider whether seemingly neutral behaviors do indeed antecede peers' aggressive responses.

The extant literature provides relatively little support for making hypotheses about whether and how the antecedents of other-gender aggression will differ from the antecedents of same-gender aggression. An initial question of interest is whether dominance-related behaviors antecede other-gender aggression at the same rate as same-gender aggression. Research on cross-gender victimization among adolescents and adults (particularly research on male-on-female aggression) suggests that dominance-related behaviors should predict aggressive responses (Archer, 2009; Jewkes, 2002; Rodkin & Berger, 2008), but it is unclear whether this pattern is evident early in childhood. A secondary question is how peers' gender impacts the relations between specific dominance-related behaviors and peers' aggression. Two scenarios are likely. On the one hand, peers might base their likelihood of an aggressive response on the patterns that apply to their own gender. Thus, male peers

might be more likely to aggress against girls if they display the same behaviors that typically trigger male peers' aggression toward boys (e.g., aggressive behavior). Similarly, female peers might be more likely to aggress against boys if they display the same behaviors that typically trigger female peers' aggression toward girls (e.g., commanding behaviors). On the other hand, peers might evaluate children's behaviors and the likelihood of responding with aggression according to the focal child's gender, rather than their own (as Underwood, Schockner, & Hurley, 2001 have suggested). In this case, for example, male peers might be expected to aggress against girls if girls behave in ways that typically invite female peers' aggression—for example, by using commanding behaviors (and vice versa for female peers; e.g., aggressive behaviors).

Methods

Participants

Participants were drawn from a multi-cohort longitudinal study of peer relationships and early school readiness. Data from the first two cohorts (i.e., the first 2 years of the study) were included in the present study; participants from the third cohort were excluded because observational data were not available. The sample was obtained by seeking parental consent from all children in 11 participating Head Start preschools located in a large southwestern city. Parental consent was sought for $N = 207$ children, and a 100% permission rate was obtained. However, eight of these children repeated preschool; thus, they participated in both Years 1 and 2 of the study. These eight children were counted as focal children and peers during Year 1 of the study; during Year 2, they were only eligible to serve as peers, not as focal children. Of the remaining 199 children, 29 were excluded from the present study as focal children because they had withdrawn from a participating school early in the academic year and were not observed. This resulted in a sample of 170 children who served as focal children for all analyses.

Just over half of the focal children (54%) were boys. At the beginning of data collection, children's average age was 52 months ($SD = 4.87$; range = 37–60 months; 91% were between 46 and 60 months). The majority of children were Mexican American (74%), with 11% European American, 5% African American, 2% Asian American, 2% Native American, 2% other and 4% unknown. Fifty-nine percent came from families whose home language was Spanish, and 70% came from two-adult homes. Additionally, 81% had family incomes at or below \$30,000. Excluded participants did not significantly differ from the target sample on any of the demographic factors.

Observational Procedures and Measures

Children's behaviors and peers' aggressive reactions to those behaviors were observed by 40 independent observers (average of 10 observers per semester; 82% female) using an adaptation of Fagot and colleagues' interactive coding system (Fagot, Hagan, Leinbach, & Kronsberg, 1985). Observers were blind to the purpose of this study. Prior to beginning data collection, observers conducted practice observations in the classroom to allow the children time to become accustomed to their presence and to minimize reactivity. Moreover, observers were present in the classroom multiple days each week over the entire academic year. Thus, children quickly adjusted to their presence and paid them little attention.

Each child was observed according to a randomized order several times over the fall and spring semesters of the academic year. Observations were conducted inside and outdoors during free-play and semi-structured play periods to ensure that children would have choice in both activities and potential interaction partners; observers refrained from coding during teacher-defined and teacher-structured group activities, such as group-time, lunchtime, and

naptime. During each observational session, the identified focal child's behaviors and her/his peers' responses to those behaviors were coded in successive 10-second observations. Observers were instructed to obtain 45 successive observations (which took approximately 15 minutes) of a focal child before moving on to the next child (in some instances, this was not possible because of variations in classroom routines; in these cases, the data from the incomplete session were retained, but a complete session was also conducted at a later time). After observing all available children in the class, observers began another round of observations by starting the list over again. On average, children were observed 8.25 times over the course of the year ($SD = 4.8$). Variations in the total number of times the children were observed were largely due to classroom level factors (e.g., class size and structure, number of vacation days), but also to variations in children's availability (e.g., school absence). Using these procedures we obtained a total of 76,738 observations (i.e., children were present in the classroom and available for coding) on the children in this sample, with an average of 462.3 observations per child ($SD = 272.3$; range = 154 – 1303). To control for variations in numbers of observations, proportion scores were calculated as shown below.

Approximately 25% of the total observations ($N = 18,930$) involved interactions with a peer. For these observations, the focal child's primary behavior was coded along with the identity of the peer and the peer's immediate behavioral response to the focal child (when more than one peer was present, only the behavior of the peer who was most closely involved with the focal child was coded). Whenever the focal child exhibited a relevant dominance-related behavior, it was coded into one of the following codes: (1) Aggressive Behavior (coded whenever the focal child physically [e.g., hit, pushed] or relationally [e.g. refused to allow peer in a playgroup, friendship withdrawal] attacked the peer, made negative or hostile statements to the peer, or exhibited antagonistic gestures toward the peer; playful aggressive behaviors, such as pretending to fight and rough-and-tumble play, were not coded in this category), (2) Commands (verbal directives that were intended to control another child's behavior), (3) Neutral Behaviors (verbal statements [e.g., "I'm using the blocks"] and nonverbal behaviors [e.g., gathering objects] that conveyed information in a neutral [neither positively nor negatively valenced] tone), and (4) Submissive Behaviors (behaviors in which the child complied with another's directive or command). Proportion scores were calculated separately for male and female peers, with either total number of male or female peer interactions as the denominator. These scores represented children's overall tendencies to use dominance-related behaviors in the context of peer interactions. The variables representing aggression, commands, and submission were independent of one another; $r_s(170)$ ranged from $-.04$ to $.09$ for interactions with male peers and from $.06$ to $.10$ for interactions with female peers. However, neutral behavior was negatively correlated (at $p < .05$) with aggression ($r_s[170] = -.42$ and $-.43$), commands ($r_s[170] = -.36$ and $-.35$), and submission ($r_s[170] = -.23$ and $-.17$) for interactions with male and female peers, respectively.

Because our focus was largely on the behaviors of the focal child that elicited aggression from a peer, we also calculated two additional sets of variables representing: (1) children's tendencies to receive peer aggression overall and (2) their tendencies to receive peer aggression in response to their dominance-related behaviors. Thus, only those peer interactions that involved a peer's aggressive response (coded as for focal child's aggression) to the focal child were used to calculate these variables (10% of peer interactions; Range 0 – 50%). Proportion scores for male peers' aggression and female peers' aggression were calculated for each child by dividing the number of aggressive peer responses from male or female peers by the total number of interactions with male or female peers, respectively. Additionally, proportion scores for each dominance-related behavior (Aggression, Commands, Neutral Behavior, and Submissive Behavior) were calculated using the number of aggressive interactions with male or female peers as the denominator.

The variables representing aggression, commands, submission, and neutral behaviors were largely independent of one another; $r_s(170)$ ranged from $-.10$ to $-.03$ for aggressive interactions with male peers and from $-.08$ to $.03$ for aggressive interactions with female peers. However, neutral behavior was negatively correlated with aggression, $r_s(170) = -.23$ and $-.23$, $p_s < .01$, for aggressive interactions with male and female peers, respectively.

Reliability estimates were obtained throughout the academic year by having two observers independently code the same child. Reliability estimates were obtained on approximately 10% of the observations. Kappas ranged from .74 (Peers' Aggression) to .83 (Children's Neutral Behaviors). The percent agreement for identity of the peer was 97%.

Results

The primary goals of the present study were to assess girls' and boys' aggressive, commanding, submissive, and neutral behaviors as they naturally occurred during interactions with male and female peers and to determine whether such behaviors would influence their likelihood of being aggressed against by those peers. Prior to testing the primary hypotheses, we considered two foundational issues that were intended to establish base rates for the study behaviors: the first set of preliminary analyses focused on the behaviors emitted by the focal girls and boys without regard for peers' behavioral responses and the second focused on peers' tendencies to aggress against focal girls and boys without regard for their behavioral displays. Tests of the main hypotheses regarding the behavioral antecedents of male and female peers' aggression were then conducted. Statistical tests were interpreted using an alpha level of .05, and Bonferroni corrections were conducted to control for multiple comparisons as needed.

Children's Use of Dominance-Related Behaviors in Interactions with Male and Female Peers

The first set of analyses explored children's tendencies to exhibit aggressive, commanding, submissive, and neutral behaviors during peer interactions. To establish a baseline of children's tendencies to engage in such behaviors with peers, we focused the analyses on peer interactions in general (rather than aggressive interactions in particular). Because these analyses used proportion scores, they controlled for variations in numbers of interactions with male and female peers. Table 1 reports descriptive statistics for children's use of the dominance-related behaviors in peer interactions for the whole sample in the first column. Two sets of variables were modestly skewed: aggressive behavior (skewness = 2.94 and 2.10 for male and female peers, respectively) and submissive behavior (skewness = 4.97 and 2.35 for male and female peers, respectively), reflecting the fact that these behaviors occurred relatively infrequently in interactions with peers for the sample. These variables were log transformed, and the transformed variables were used in subsequent analyses. However, non-transformed means are reported for ease of communication.

Paired t -tests comparing each type of dominance-related behavior observed in interactions with male peers indicated that each type of behavior was significantly different from the others, using a Bonferroni-corrected error rate of $p = .008$ (see Table 1 for means and standard deviations). That is, neutral behaviors occurred more often in interactions with male peers than did commands, aggressive behaviors, and submissive behaviors, $t(169) = 14.70, 19.13, \text{ and } 29.52$, $p_s < .001$, Cohen's $d_s = 1.14, 1.49, \text{ and } 2.47$, respectively (Cohen's d for paired t -tests was calculated as recommended by Morris and DeShon (2002) to account for the correlation among within-subjects variables). Similarly, commands occurred more often than aggressive and submissive behaviors, $t(169) = 5.03 \text{ and } 15.49$, $p_s < .001$, Cohen's $d_s = .39 \text{ and } 1.31$, respectively, and aggressive behaviors occurred more often than submissive behaviors, $t(169) = 11.35$, $p < .001$, Cohen's $d = .91$. The same pattern was

apparent in children's use of dominance-related behaviors in interactions with female peers, $t(169)$ ranged from 5.23 to 24.81, all p s < .001, Cohen's d s ranged from .41 to 2.11 (see Table 1). Moreover, paired t -tests comparing children's use of each dominance-related behavior in the context of male peer interactions with their use of the same behavior in the context of female peer interactions indicated that there were no differences, $t(169)$ ranged from 0.10 to 1.73, all ns . Thus, for the sample as a whole, children were no more or less likely to use neutral, commanding, aggressive, or submissive behaviors in interactions with male peers than they were in interactions with female peers.

However, when the gender of the focal child and peers were both considered, differences did emerge in the use of dominance-related behaviors with female peers (see Table 1). When interacting with female peers, girls were more likely than boys to display commands (M s = .17 and .13 and SD s = .10 and .11 for girls and boys, respectively) and submissive behaviors (M s = .05 and .03 and SD s = .06 and .04 for girls and boys, respectively), $t(168) = 2.65$ and 2.41 , p s < .01 and .05, d s = .41 and .37. Girls' and boys' tendencies to exhibit dominance-related behaviors in interactions with male peers were not significantly different (all p s > .05).

Aggression toward Focal Children from Male and Female Peers

To assess whether male and female peers directed aggression to boys and girls at different rates, we computed independent samples t -tests with focal child gender as a predictor of male and female peers' aggression (in separate analyses). By using proportion scores computed separately for male and female peers, we controlled for children's tendencies to play more often with same-gender versus other-gender peers (in the present sample, girls interacted more frequently with female peers than did boys [M s = .64 and .28, SD s = .20 and .16, for girls and boys, respectively], $t(149.61) = 13.10$, p < .001, Cohen's $d = 2.04$, and boys interacted more frequently with male peers than did girls [M s = .72 and .36, SD s = .16 and .20, for boys and girls, respectively], $t(149.61) = 13.10$, p < .001, Cohen's $d = 2.04$). Analyses suggested that there was no preference on the part of either male or female peers to direct aggression to same-gender peers once the frequency of play with male and female peers was controlled. Thus, girls and boys were aggressed against at similar rates from male peers (M s = .10 and .11 and SD s = .10 and .07, for girls and boys, respectively), $t(168) = 0.93$, ns , and from female peers (M s = .09 and .10 and SD s = .06 and .11, for girls and boys, respectively), $t(168) = 0.29$, ns .

Girls' and Boys' Dominance-Related Behaviors as Triggers of Male and Female Peers' Aggression

Descriptive analyses—The data in Table 2 indicate how prevalent each behavior was in triggering male and female peers' aggressive responses. These data are presented for the sample as a whole in the first column. The distributions of variables reflected their rate of occurrence in the sample. Most variables were normally distributed, suggesting that they occurred with at least moderate frequency. One variable was modestly skewed (commands; skewness = 2.01 and 2.27 for male and female peers, respectively) and one was highly skewed (submissive behavior; skewness = 8.76 and 6.34 for male and female peers, respectively), reflecting the fact that these behaviors were relatively infrequent triggers of peers' aggression for the sample as a whole. These variables were log transformed, and the transformed values were used in subsequent analyses. However, non-transformed means are presented for ease of interpretation.

Dominance-related behaviors as triggers of male and female peers' aggression—We considered the magnitude of girls' and boys' dominance-related behaviors, as a group, in predicting male peers' and female peers' aggressive responses. For

these analyses, scores representing the four focal child behaviors (aggression, commands, neutral, and submission) were summed. Together, these behaviors elicited over half of female peers' observed aggressive behaviors and nearly two-thirds of male peers' observed aggressive behaviors ($M_s = 0.57$ and 0.65 , $SD_s = 0.39$ and 0.36 , for female and male peers' aggression, respectively). A paired samples t -test showed that, as a group, children's dominance-related behaviors were more likely to trigger male peers' aggression than female peers' aggression, $t(169) = 2.10$, $p < .05$, Cohen's $d = .16$. This finding remained even after removing neutral behaviors from the composite score, suggesting that the effect was accounted for largely by the aggressive, commanding, and submissive behaviors rather than by neutral behavior, $t(169) = 2.07$, $p < .05$, Cohen's $d = .16$, ($M_s = 0.41$ and 0.34 , $SD_s = 0.32$ and 0.34 , for male and female peers' aggression, respectively).

Breaking this finding down by focal child gender, however, presented a more complicated picture (see Figure 1). Male peers were more likely to respond with aggression to dominance-related behaviors when they were emitted by a boy ($M = .72$, $SD = .28$) than when they were emitted by a girl ($M = .57$, $SD = .42$), $t(132.33) = 2.58$, $p < .01$, Cohen's $d = .41$ (modified degrees of freedom are reported because Levene's test indicated heterogeneity of variances). Similarly, female peers were more likely to direct aggression in response to dominance-related behaviors when they were emitted by a girl ($M = .68$, $SD = .33$) than when they were emitted by a boy ($M = .47$, $SD = .42$), $t(166.69) = 3.79$, $p < .001$, Cohen's $d = .58$. Both of these analyses suggest that, as a whole, dominance-related behaviors were less likely to be triggers of cross-gender aggression than they were for same-gender aggression. This effect was particularly pronounced for boys, such that boys' dominance-related behaviors triggered female peers' aggression (cross-gender aggression) less than half the time ($M = .47$, $SD = .42$) compared to triggering male peers' aggression (same-gender aggression) nearly three-fourths of the time ($M = .72$, $SD = .28$), $t(90) = 4.99$, $p < .001$, Cohen's $d = .54$.

Variations in dominance-related behaviors as triggers of male and female peers' aggression—We next examined the four individual dominance-related behaviors (aggression, commands, neutral, and submission) as triggers of male and female peers' aggressive responses and assessed whether these varied by child gender. Because the four behaviors were not independent, we used repeated measures analyses of variance (RM ANOVAs) to test these hypotheses. Specifically, two RM ANOVAs (one for male peers' aggression and one for female peers' aggression) were computed in which the four dominance-related behaviors served as the within-subjects variable (4 levels) and child gender (2 levels) served as the between-subjects variable (see Figure 1). Analyses of male peers' aggression are presented first, followed by analyses of female peers' aggression.

Analyses assessing triggers of male peers' aggression revealed a significant main effect for children's dominance-related behaviors, $F(2.04, 343.05) = 54.89$, $p < .001$, partial $\eta^2 = .25$. The child behavior $\times$ child gender interaction approached, but did not reach, statistical significance, $F(2.04, 343.05) = 2.70$, $p < .10$, partial $\eta^2 = .02$. Because the sphericity assumption was not met for these analyses, $\chi^2(5) = 148.41$, $p < .001$, the Greenhouse-Geisser correction was applied to the degrees of freedom to account for reduced power.

The significant main effect for child behavior suggested that there was variation in the specific dominance-related behaviors that elicited male peers' aggression. Follow up paired t -tests, using a Bonferroni corrected alpha of $p = .008$, indicated that children's aggressive ($M = .29$, $SD = .29$), commanding ($M = .10$, $SD = .16$), and neutral ($M = .24$, $SD = .25$) behaviors were all significantly more likely to trigger aggressive responses from male peers than were submissive behaviors ($M = .02$, $SD = .09$), $t_s(169) = 12.00$, 6.74 , and 11.31 , $p_s < .001$, Cohen's $d_s = 1.06$, $.54$, and 1.00 . Additionally, aggressive and neutral behaviors were

more likely to trigger male peers' aggression than were commands, $t(169) = 7.97$ and 6.73 , $p < .001$, Cohen's $d = .65$ and $.54$. However, there were no significant differences between aggressive and neutral behaviors, $t(169) = 1.67$, ns . These results are depicted in Figure 2.

Similar procedures were followed to assess children's dominance-related behaviors as triggers of female peers' aggression. These analyses also revealed a significant main effect for children's behaviors, $F(2.07, 348.38) = 32.88$, $p < .001$, partial $\eta^2 = .16$. In this case, the main effect was subsumed by a significant child behavior X child gender interaction, $F(2.07, 348.38) = 3.63$, $p < .05$, partial $\eta^2 = .02$. Again, the Greenhouse-Geisser correction was applied due to the significant sphericity estimate, $\chi^2(5) = 166.83$, $p < .001$. The significant interaction was broken down by computing one-way RM ANOVAs for girls and boys separately, with child behavior as the within-subjects factor.

There was a statistically significant effect for child behavior for girls, $F(2.23, 173.63) = 17.89$, $p < .001$, partial $\eta^2 = .19$ (sphericity estimate was significant at $\chi^2(5) = 74.71$, $p < .001$), which suggested that there was variation in the specific dominance-related behaviors that elicited female peers' aggression toward girls. Follow-up paired t -tests, using a Bonferroni corrected alpha of $p = .008$, indicated that girls' aggressive ($M = .20$, $SD = .25$), commanding ($M = .19$, $SD = .24$), and neutral ($M = .28$, $SD = .27$) behaviors were all significantly more likely to trigger aggressive responses from female peers as compared to submissive ($M = .01$, $SD = .06$) behaviors, $t(78) = 6.78$, 6.31 , and 8.63 , $p < .001$, Cohen's $d = .93$, $.85$, and 1.16 . There were no significant differences among aggressive, commanding, and neutral behaviors (see Figure 3).

A significant effect of child behavior was also obtained for boys' behavioral predictors of female peers' aggression, $F(1.75, 157.17) = 18.51$, $p < .001$, partial $\eta^2 = .17$ (sphericity estimate was significant at $\chi^2(5) = 146.97$, $p < .001$). Thus, there was also variation in the specific behavioral triggers of female peers' aggression toward boys (see Figure 4). Aggressive behaviors ($M = .22$, $SD = .33$) were more likely to trigger female peers' aggression toward boys than were commands ($M = .06$, $SD = .11$) and submissive behaviors ($M = .02$, $SD = .01$), $t(90) = 4.36$ and 4.74 , $p < .001$, Cohen's $d = .50$ and $.62$. Boys' neutral ($M = .19$, $SD = .28$) behaviors were also more likely to trigger female peers' aggression than were commands and submissive behaviors, $t(90) = 4.17$, 6.23 , $p < .001$, Cohen's $d = .49$ and $.90$. Although boys' commands only triggered female peers' aggression 6% of the time, they were still more significant triggers than submissive behaviors, $t(90) = 4.74$, $p < .001$, Cohen's $d = .62$. There were no significant differences between aggressive and neutral behaviors as triggers of female peers' aggression.

Discussion

Overall, the findings suggested that dominance-related behaviors that are relevant to antagonistic or coercive forms of control, particularly aggressive and commanding behaviors, were significant predictors of peers' aggression in early childhood. Neutrally-toned statements and acts were also significant predictors of peers' aggression. Moreover, there were important and interesting gender-based differences in the extent to which these behaviors affected children's risk for aggression. In addition to shedding new light on the bases of early aggression, these findings highlight the important role of gendered social contexts and have implications for girls' and boys' contemporaneous and subsequent social development.

Aggression By Whom – Aggression Toward Whom

For both girls and boys, same- and other-gender aggression occurred at similar rates once time spent with male and female peers was controlled. Yet, sexual selection theory posits

that aggression should occur more often among same-gender peers than among other-gender peers because it may be used to obtain power and access to resources within gender-based dominance hierarchies (Geary et al., 2003; Pellegrini, Roseth et al., 2007). This apparent discrepancy may be explained by the fact that we did find that children played more often with same-gender peers than with other-gender peers and thus the raw frequency of same-gender aggression was greater than the raw frequency of other-gender aggression. Therefore, the ideas that underlie sexual selection theory may apply more broadly to same-gender interaction in early childhood, rather than to same-gender aggression in particular (Geary et al., 2003; Pellegrini, Roseth et al., 2007).

The fact that similar findings were reported in a prior study suggests that these effects may be robust (Ostrov & Keating, 2004). Moreover, evidence from studies of adolescents suggests that this finding translates across developmental periods (Berger & Rodkin, 2009; Olweus, 1993; Veenstra et al., 2007). To be clear, however, the extant research is not entirely consistent, with the greatest ambiguity evident for young boys. Perhaps this is due to variations in young boys' use of various forms of aggressive behavior. For instance, preschool boys may be particularly inclined to target physical aggression within gender lines, even once time spent with same-gender peers in controlled (Ostrov & Keating, 2004). In the present study, physical, verbal, and relational forms of aggressive behavior were not differentiated. Thus, further testing of the hypothesis that the form of aggression moderates these relations would be beneficial. However, even if future research supports a robust moderating effect associated with the form of aggressive behavior, it likely will not diminish the overall conclusion that there is heterogeneity in the targeting of aggression within and across gender lines that needs to be accounted for. Thus, it is necessary to understand how child and peer gender jointly operate to impact children's involvement in aggression.

Dominance-Related Antecedents of Same- and Other-Gender Aggression

The behaviors studied here—aggressive behavior, commands, neutral behaviors, and submissive behaviors—were largely unrelated to one another, suggesting that there was variability among children in their relative use of each of these behaviors. As a group, these behaviors explained 68% of the variance in girls' same-gender aggression and 72% of boys' same-gender aggression. Thus, children's own aggressive, commanding, neutral, and submissive behaviors were seen over two-thirds of the time to be precursors to same-gender peers' aggressive responses. Dominance-related behaviors have long been thought to be important for same-gender aggression, particularly for boys. Indeed, social dominance models underlie Olweus' (1978) classic study of boys as whipping boys and bullies, and they are central to evolutionary arguments about boys' use of aggression toward other boys as a means to establish power and resource control and to provide them opportunities to practice skills that they will eventually use for mating (Geary, 1999; Pellegrini, 2008). Moreover, several studies have shown that a variety of dominance-related behaviors, including aggressive behaviors and passive, submissive behaviors are predictors of boys' victimization by peers, although the relative significance of these behavioral predictors seems to vary by age (Coie et al., 1991; Hanish et al., 2004; Olweus, 1978; Schwartz et al., 1993). However, the role of dominance-related behaviors in girls' aggression toward other girls has garnered less empirical and theoretical attention (c.f., Hawley, 2003; Hawley et al., 2008). The present findings are important because they extend the social dominance model to explain young girls' same-gender aggression, providing support for the argument that girls, like boys, are sensitive to dominance rankings (c.f., Pellegrini, 2008). Thus, for both young boys and girls, same-gender aggression was largely a function of dominance-related interaction patterns.

For aggression by other-gender peers, the aggregated group of dominance-related behaviors accounted for comparatively less (as compared to aggression by same-gender peers) of the

variance in peers' aggressive responses—girls' dominance-related behaviors triggered 57% of male peers' aggressive behaviors whereas boys' dominance-related behaviors triggered only 47% of female peers' aggressive behaviors. As such, the behaviors studied here were somewhat less effective in explaining other-gender aggression than they were for same-gender aggression. It has been suggested that dominance hierarchies and dominance-related behaviors should be more predictive of children's within-gender aggression than of their cross-gender aggression given their relevance to developing the skills necessary for intrasexual competition (Geary, 1999; Maccoby, 1998; Pellegrini, 2008). The present findings support this supposition, although the dominance-related behaviors studied here clearly do antecede other-gender peers' aggressive behavior at modest rates. This difference in magnitude for same and other-gender aggression may reflect children's differential decision-making about the costs and benefits of aggressing against a peer who has exhibited dominance-related behaviors in same- versus other-gender interactions. This may be particularly relevant in the case of female peers' aggression toward boys, where power imbalances favor boys relative to girls (Pellegrini, 2008). Indeed, less than half of all female peers' aggression was anteceded by boys' dominance-related behaviors. As Hawley (1999) and Pellegrini (2008) have argued, individuals should engage in aggression toward peers when the anticipated benefits of aggressing outweigh the anticipated costs. Perhaps boys' dominance-related behaviors are particularly threatening to girls, such that girls perceive more costs (e.g., injury, social sanctions) to aggressive responding than do other boys.

These findings raise the important question of what else predicts young girls' and boys' aggression. In the present study we examined dominance-related behaviors that are relevant to coercive means of control. However, the literature on social dominance has suggested that, beginning in preschool, affiliative behaviors are also used to establish dominance and control (Hawley, 1999; Pellegrini, 2008). Thus, perhaps affiliative behaviors, such as cooperation, requests (e.g., for play, resources, or information), and social invitations are interpreted by peers as dominance attempts and also trigger aggressive responses. Moreover, affiliative behaviors may moderate the impact of coercive dominance-related behaviors (Rose et al., 2011). Thus, the meaning and impact of child behaviors, such as aggression and commands, may depend upon whether they are exhibited in the context of affiliative behaviors. It is noteworthy that affiliation represents an important social goal for girls. It is characteristic of relationally aggressive behavior, which predominate in girls' displays of aggression, and it is predictive of girls' social status (Crick, Casas, & Ku, 1999; Hawley, 2003; Maccoby, 1998; Rose & Rudolph, 2006). Of particular interest is the question of whether affiliative behaviors, or some forms of affiliative behaviors (whether in isolation or in the context of coercive behaviors) would account for the heretofore unexplained variance (43%) in male peers' aggression to girls.

Specific behavioral antecedents—There were key differences in the magnitude of each specific behavior in predicting peers' aggression. In some cases these differences depended on the gender pairing of the aggressor and victim. In other cases, findings were similar across gender pairings.

Children's own aggressive behavior tended to trigger peers' aggression. It is particularly interesting that only 11% of all peer interactions were characterized by children's own aggression, but 25% of aggressive peer interactions involved children's own aggression (averaging across male and female peer interactions). This proportional pattern is different from what was seen for all other dominance-related behaviors in that commands, neutral behaviors, and submissive behaviors all occurred proportionally less frequently in aggressive exchanges. Moreover, this effect was evident regardless of the gender pairing of aggressor and victim; in other words, girls' and boys' own aggressive behaviors elicited similar responses from both male and female peers. Aggressive behaviors are aversive and

disruptive and have been shown to be problematic to the peer climate and to the quality of social relationships and interactions (DeRosier, Cillessen, Coie, & Dodge, 1994). That aggressive behaviors trigger aggressive responses is not new, but the findings of this study highlight the robustness of this effect in young children and show that it is equally evident in both their gender-segregated and gender-integrated interactions (Goldstein et al., 2001; Hanish et al., 2004; Hanish & Guerra, 2000; Olson, 1992; Patterson et al., 1967).

For some young children, this cycle of child aggressive behavior and aggressive peer response may be outgrown as they develop more competent social skills. For others, however, the early emergence of both aggressive behavior and aggressive peer responses may lead to a more engrained pattern of aggression and victimization (Olson, 1992). When such patterns persist over time, they signal a worrisome trajectory. Indeed, children who develop an identity or reputation as being both aggressive and victimized function at considerably lower levels across a wide range of intrapersonal and interpersonal dimensions than do children who are only aggressive, only victimized, or neither. The effects of this aggressive-victim status are evident on children's emotional, behavioral, social, and academic functioning (Schwartz, Proctor, & Chien, 2001). For this reason, interrupting this pattern early in development may be an effective strategy for reducing later aggression-related problems.

Commanding behaviors were also related to peers' aggression. However, unlike aggressive behavior, the impact of commands on the risk of peer aggression was dependent on the gender pairing of the interactional partners. Girls tended to use commands in interactions with female peers more often than did boys, although there were no differences in girls' and boys' use of commands with male peers (Benenson, Aikins-Ford, & Apostoleris, 1998). Furthermore, peers, particularly female peers, were sensitive to and reactive toward their peers' commands, particularly when emitted by other girls. That is, peers responded aggressively toward girls who gave commands. This finding may reflect girls' greater orientation towards indirect patterns of communication and influence as compared to boys (Miller et al., 1986; Serbin et al., 1982). By behaving aggressively toward girls who give commands, peers may, in effect, punish such behaviors. Over time, this may make it difficult for girls to develop assertive behaviors and leadership skills. In fact, other research has shown that, even as young as preschool, there are gender differences in both the rates and the meaning of assertive behaviors. Sebanc and colleagues (2003) reported that girls are less likely than boys to use assertive behaviors, and that girls' assertive behaviors were not associated with peer acceptance as was true for boys. However, this relation may be moderated by the specific nature of children's assertive behaviors. One study has suggested that the degree to which assertive girls are rejected or accepted by peers depends on their use of physically and relationally assertive behaviors (Ostrov, 2006). Clearly, additional research is needed to explore the circumstances under which commanding behaviors result in positive versus negative peer interactions and relationships for girls. However, the fact that young girls were more likely than young boys to receive negative responses from peers for their commanding behaviors could shape different developmental trajectories for girls and boys with regard to the use of assertiveness and leadership skills, perhaps ultimately contributing to gender disparities in adult occupations involving positions of leadership.

Interestingly, neutral behaviors triggered peers' aggression at rates that paralleled those of aggressive behaviors, and this was true for all gender pairings. This finding raises the question as to why such behaviors play such a significant role in eliciting young children's aggression. At the heart of this issue may be the meaning of neutral behaviors—both for the child who is exhibiting the neutral behavior and for the peer who is responding to that behavior. Neutrally-toned statements, comments, and actions delivered during peer interactions may be ambiguous, particularly when compared to more valenced behaviors in

which emotional tone as well as content of the behavior or verbalization can carry information. Ambiguity, by definition, leaves the behavior open to interpretation by others and to possible misperceptions about the meaning of the behavior. For example, the research on hostile attribution biases suggests that some children, such as those who are more aggressive, tend to misinterpret peers' ambiguous behaviors as having a hostile intent (Dodge, 2006). This finding may reflect, at least in part, a tendency for some children to respond aggressively to neutral behaviors. Alternatively, or in addition, neutral behaviors may have subtle meanings that are only understood by members of the immediate social group. If such subtlety involves such threatening acts as relational aggression, exclusion from a peer group, or control of resources, perhaps objective observers would interpret the behavior as neutral when in fact it is intended to be aggressive. This may be particularly likely for girls who are socially sensitive and who tend to use social and relational aggression as their predominant form of aggression (Putallaz et al., 2007; Underwood, 2003). Further research exploring how seemingly neutral behaviors contribute to aggression would shed more light on this intriguing finding. An additional question of interest is whether this finding generalizes across developmental levels; perhaps this relation is more common in younger than in older children due to social-cognitive developmental differences.

In contrast, submissive behaviors were unrelated to peers' aggression both within and across genders. This finding supports prior work with young children which has suggested that, early in life, there is little relation between submissive, passive, and internalizing behaviors and being the victim of aggression (Alasker & Valkanover, 2001; Boivin, Hymel, & Hodges, 2001; Hanish et al., 2004; Hanish & Guerra, 2000; Schwartz et al., 2001). Interestingly, however, in the present study, submissive behaviors very rarely occurred in any peer interactions for children of this age; they were used most often, though still quite infrequently (only 5% of the time), in girls' interactions with female peers. Thus, children's relatively infrequent use of submissive behaviors at this age may have limited our ability to detect a relation between submission and aggression. As children get older, however, significant relations between submission and victimization do emerge and are evident by the time children reach middle-childhood (Schwartz et al., 1993). What is still not well understood, however, is whether submissive behavioral risk factors increase in importance at equal rates for both girls and boys and for same- and cross-gender aggression. Future research that examines these questions within and across gender for older samples would help to further illuminate the relation of submissive behavior and aggression.

Strengths and Limitations

The findings from this study provide new support for the generalizability of dominance-related behaviors as antecedents of peers' aggression. This generalizability is evident within and across gender lines, as the findings suggest that dominance-related behaviors operate as antecedents of same- and cross-gender aggression. Moreover, our use of a largely impoverished, at-risk sample of Mexican American preschoolers, on the one hand, further increases generalizability. The findings that aggressive and commanding behaviors, but not submissive behaviors, led to peers' aggression (depending on circumstances) is compatible with the findings of related studies relying on majority samples of preschool age children (e.g., Hanish et al., 2004; Olson, 1992; Patterson et al., 1967; Sebanc et al., 2003). On the other hand, however, the specific nuances of the present findings (i.e., the gender-based circumstances under which dominance-related behaviors did and did not predict peers' aggression and the magnitude of those relations) should be replicated across samples that vary in background characteristics and cultural orientation to determine, for instance, if the orientation toward traditional gender roles that is present in Hispanic cultures impacted the results of the present study (Golding, 1990).

This study adds to the body of research that has relied on observational methodologies to study when and why aggression occurs among children (e.g., Ostrov & Keating, 2004; Pellegrini, Roseth et al., 2007). Despite the historical and contemporary popularity of studying aggression, only a handful of studies have used observational methods – likely because of the difficulty and demands of observing children’s naturally-occurring aggressive interactions. For this reason, observational studies of aggression often use small samples and/or brief observation periods. In the present study, we used a relatively large sample of children observed multiple times per week across the entire academic year, which provides added power for testing hypotheses.

Observational methods have many strengths. For example, they provide objective measures of aggressive behavior that avoid the cognitive limitations that make children’s self and peer reports of aggression unstable in early childhood. But, it is also worth noting that the use of naturalistic observations, as we did here, is sensitive to naturally occurring variations among children (e.g., some children are more likely to be absent from preschool or to arrive late and leave early) and among the preschools themselves (e.g., some schools had larger class sizes or more vacation days than others). This results in variations in the number of observations that children receive. For example, children in larger classes have fewer observations than children in smaller classes because it takes the observers longer to complete a round of observations when there are more children to be observed (i.e., observers complete a set of observations for the first child on the list before moving on the next, and so on). It is also worth noting that variations across classes that affect children’s likelihood of being observed can result in within-classroom dependencies (Duncan & Raudenbush, 1999). Because we had only 11 classrooms in the present sample, there was not sufficient power to model classroom level variability. Thus, future studies that use research methodologies that can either minimize this variation (e.g., with laboratory observations) or account for it (with a larger sample of classrooms) are welcomed.

Furthermore, our coding scheme did not differentiate physical and relational forms of aggressive behavior because our primary purpose was to focus on variations in the behavioral antecedents of peers’ aggression by child and peer gender, rather than to focus on variations in forms of aggressive behavior. Nevertheless, relational and physical subtypes of aggressive behavior are, themselves, linked to gender (Card et al., 2008). Moreover, physically and relationally aggressive behaviors may be differentially linked to rates of same- and other-gender aggression (Crick et al., 2006; Ostrov, 2006). An important avenue for future research, therefore, will be to integrate these two issues by considering the extent to which interactional patterns trigger one form of aggressive behavior over another and whether this then varies by gender. For instance, children’s own physical aggression may be more likely to trigger peers’ physical aggression than peers’ relational aggression, whereas commands may tend to trigger relational aggression. Considering whether such patterns are robust and whether they vary by child and peer gender would further expand the knowledge in this area.

Conclusions

These findings have important implications for the study of gendered peer relationships. The majority of the research on gendered peer interactions and relationships has been done with same-gender peers, reflecting children’s tendencies toward gender segregation. Yet, gender-integrated interactions should not be ignored as they are important components of children’s social worlds (Fabes et al., 2003). The findings regarding girls’ and boys’ involvement in aggression with same-and other-gender peers suggest gender-based similarities as well as differences in the nature of their aggressive interactions. These findings also highlight the need for future research that addresses other facets of girls’ and boys’ aggressive

interactions and those that move beyond aggressive interactions to explore a wider range of social processes in gender segregated and integrated interactions.

Finally, the results of the present study reflect a need for continued research on aggression within social contexts across developmental levels. Early childhood represents a critical social developmental period in that, for most children, the preschool and social settings that are encountered at this age provide the first opportunity for children to interact with large numbers of same-age peers. For this reason, the experiences that young children have in their peer interactions have the potential to impact the development of their social skills, their early experiences in the formation of peer relationships, their rudimentary expectations of peers and peer experiences, and their display of gender-typed behaviors. Early peer experiences are predictive of both short- and long-term developmental outcomes (Rubin, Bukowski, & Parker, 2006). Thus, it is important for future research to consider whether and how these patterns change with and impact development.

It has been speculated that the types of interactions that girls and boys have with one another at an early age form the foundation for future relationship patterns (Gottman, 1986; Maccoby, 1998; Martin & Fabes, 2001). For example, research with adolescent and adult samples has shown that males' harassment of and violence toward females' is related to males' dominance motives (Archer, 2009; Jewkes, 2002). The findings of the present study provide modest support for this idea in early childhood, at least with respect to coercive types of dominance-related behaviors. Those concerned with relationship violence and related problems in adolescence and adulthood (e.g., sexual harassment, partner violence, etc.) might find that a developmental focus on young children provides new insights into the early precursors of these behaviors, informing developmental theories about how males' sensitivity to dominance cues impacts the targeting of aggression toward females and contributing to interventions to reduce later sexual harassment, partner violence, and related behaviors.

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Figure 1. Aggressive, Commanding, Neutral, and Submissive behaviors (combined) as triggers of girls' and boys' aggression from male and female peers.

Figure 2. Aggressive, Commanding, Neutral, and Submissive behaviors as triggers of children's aggression from male peers.

Figure 3. Aggressive, Commanding, Neutral, and Submissive behaviors as triggers of girls' aggression from female peers.

Figure 4. Aggressive, Commanding, Neutral, and Submissive behaviors as triggers of boys' aggression from female peers.

Table 1
Means and Standard Deviations for Dominance-Related Behaviors: All Interactions with Male and Female Peers

Dominance-Related Behavior	All Children (N = 170)			Boys (N = 91)			Girls (N = 79)		
	Range	M	SD	Range	M	SD	Range	M	SD
A. All Interactions with Male Peers									
Aggressive Behavior	0.00 – 0.83	0.12	0.10	0.01 – 0.83	0.12	0.10	0.00 – 0.41	0.12	0.10
Command	0.00 – 0.47	0.16	0.10	0.00 – 0.41	0.15	0.09	0.00 – 0.47	0.17	0.12
Neutral	0.08 – 0.80	0.39	0.14	0.09 – 0.74	0.40	0.14	0.08 – 0.80	0.38	0.15
Submission	0.00 – 0.46	0.03	0.05	0.00 – 0.19	0.03	0.03	0.00 – 0.46	0.03	0.06
B. All Interactions with Female Peers									
Aggressive Behavior	0.00 – 0.67	0.10	0.09	0.00 – 0.67	0.12	0.11	0.00 – 0.25	0.09	0.06
Command	0.00 – 0.47	0.15	0.11	0.00 – 0.47	0.13	0.11	0.00 – 0.44	0.17	0.10
Neutral	0.00 – 1.00	0.39	0.17	0.00 – 0.78	0.38	0.19	0.09 – 1.00	0.40	0.15
Submission	0.00 – 0.33	0.04	0.05	0.00 – 0.17	0.03	0.04	0.00 – 0.33	0.05	0.06

Note: Dominance-related behaviors are calculated as proportion scores, with total number of male or female peer interactions as the denominator. Non-transformed means are reported.

Table 2
Means and Standard Deviations for Dominance-Related Behaviors: Aggressive Interactions with Male and Female Peers

Dominance-Related Variable	All Children (N = 170)		Boys (N = 91)		Girls (N = 79)	
	M	SD	M	SD	M	SD
A. Aggressive Interactions with Male Peers						
Aggressive Behavior	0.29	0.29	0.33	0.27	0.24	0.31
Command	0.10	0.16	0.10	0.13	0.11	0.20
Neutral	0.24	0.25	0.28	0.23	0.20	0.26
Submission	0.02	0.09	0.01	0.05	0.02	0.12
B. Aggressive Interactions with Female Peers						
Aggressive Behavior	0.21	0.29	0.22	0.33	0.20	0.25
Command	0.12	0.20	0.06	0.11	0.19	0.24
Neutral	0.23	0.28	0.19	0.28	0.28	0.27
Submission	0.01	0.04	0.02	0.01	0.01	0.06

Note: Dominance-related behaviors are calculated as proportion scores, with either male peers' or female peers' aggression as the denominator. Non-transformed means are reported.