

A Relational Perspective on Aggression: The Role of Friends, Victims, and
Unfamiliar Peers in the Use of Aggressive Behavior

by

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ABSTRACT

Aggression is inherently social. Evolutionary theories, for instance, suggest that the peer group within which an aggressor is embedded is of central importance to the use of aggression. However, there is disagreement in the field with regard to understanding precisely how aggression and peer relationships should relate. As such, in a series of three empirical studies, my dissertation takes a relational approach and addresses some of the inconsistencies present in the extant literature. In Study 1, I examined how qualities of youth's close friendships contributed to the use of aggression, both concurrently and over time. I found that youth with large friendship networks were more aggressive, whereas those with highly interconnected friendship network decreased in aggression over time. Using a dyadic mediation model, the second study considered the precursors to aggressors' friendships with peers. Specifically, I explored aggressive youth's interactions with unfamiliar peers and assessed how the interactions that unfold affected the quality of the relationship. I found that dyads who were highly discrepant in their tendencies toward aggression failed to collaborate well with one another, and this led to less positive perceptions of one another. Whereas the first two studies concerned aggressors' relationships with their friends (Study 1) and acquaintances (Study 2), Study 3 focused on a different type of relationship – the relationship between an aggressor and his or her victim(s). In the third study, I explored how power dynamics operate within an aggressor-victim dyad and assessed whether differences in the balance of power between the aggressor and victim affected the strength of their relationship. I found that more aggressor-victim dyads were characterized by a relative balance than imbalance in power, and that power balanced dyads had stronger and more sustained aggressor-victim

relationships. By taking a relational approach to the study of aggression, this dissertation has advanced extant work in the field. That is, these findings move away from the simplification and aggregation of relational constructs (e.g., relationships, friendships), and instead consider the nuances of specific types of relationships or interactions with specific peers, allowing for a better understanding of the relational nature of aggression.

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CHAPTER 1

GENERAL INTRODUCTION

Aggression is inherently a social interaction; whether considering schoolyard bullying or gang violence, aggression involves the relationships and social groups within which individuals are embedded (Parault, Davis, & Pellegrini, 2007; Venkatesh, 1997). At a minimum, aggression involves a perpetrator (aggressor) and a target (victim), such that there is a relationship between aggressor and victim. Aggressive acts often involve others as well (Craig, Pepler, & Atlas, 2000). For instance, there may be bystanders who view aggressive interactions but are relatively uninvolved, or others who intervene to encourage the aggressor or to defend the victim (Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996). As such, aggression can engender peer support or peer denigration. Not surprisingly, aggression can impact one's own and others' peer relationships, such as friendships. For instance, aggression may act as a barrier to the formation of friendships (Dodge, 1983). Also, having friends may affect the use of aggression through socialization and peer contagion processes (Dijkstra, Berger, & Lindenberg, 2011; Poulin, Dishion, & Haas, 1999). Thus, for a multitude of reasons, aggression is impacted by, and impacts, peer relationships.

Evolutionary theories provide a functional explanation for why peer relationships and aggression often go hand in hand. According to evolutionary theories of social dominance, members of a peer group must compete with one another for access to valuable and scarce resources, including material resources (e.g., preferred objects or seats in a classroom) or social rewards (e.g., attention; social options on the weekend; Faris & Felmlee, 2011; Hawley, 2003; Pellegrini & Bartini, 2000; Pellegrini, 2002;

Savin-Williams, 1979). Within a peer group, those who have higher social status and who hold higher positions within the dominance hierarchy have greater access to these valued resources than those in lower status positions. It has been posited that aggression may be a strategy used to gain control over these resources (Buss & Shackelford, 1997; Wilson & Daly, 1985). Aggression may be a means of gaining social dominance itself; aggression may be used to manipulate one's own and others' social relationships and to position oneself in higher standing (relative to others) within the peer group, thus giving the aggressor power and concomitant access to resources. As such, viewed from an evolutionary perspective or a social dominance perspective, aggression is entrenched within the structure of the peer group and the interactions and relationships among members of the group. That is, the use of aggression can directly impact one's own and others' position within the social group. Therefore, understanding the use of aggression requires an examination of the social group and the peer relationships that aggressors have, the impact of these relationships on the use of aggression, and the impact of aggression on these relationships.

Grounded in evolutionary theories, aggression is conceptualized in this dissertation as a relational phenomenon, thereby requiring examination of the peer group within which aggressors are situated. Although this perspective is applicable to the study of aggression across developmental levels, the early adolescent period is of particular interest. Early adolescence is a troublesome time, in that aggressive behavior in adolescence is both prevalent and harmful (Berger & Rodkin, 2009; Card, Stucky, Sawalani, & Little, 2008; Farmer et al., 2002). Aggression in adolescence leads to emotional, behavioral, social, and academic maladjustment, both for the aggressor and

the victim (Card et al., 2008; Hodges & Perry, 1999; Kochel, Ladd, & Rudolph, 2012; Storch & Ledley, 2005). Despite this, aggression among youth persists and, in fact, peaks in early adolescence, with 7-32% of youth reported as aggressors and 17-24% reported as victims (Berger & Rodkin, 2009; Farmer et al., 2002; Moffitt, 1993; Nansel et al., 2001; Storch & Masia-Warner, 2004). Further, adolescent aggression is a developmental precursor to later aggression; youth aggression predicts aggression later in adolescence and into adulthood (Eron & Huesmann, 1984; Huesmann, Eron, Lefkowitz, & Walder, 1984). It also predicts related behaviors, such as delinquency and crime, including number of convictions and violent crimes (Farrington, 1993; Loeber & Dishion, 1983; Roff & Wirt, 1984; Roff, 1992). Thus, in addition to affecting youth's lives, adolescent aggression has broad-reaching consequences across the lifespan. As such, there is good reason to be concerned about aggression in adolescence.

During adolescence and, specifically, the transition from elementary school into middle school, peers' role in the use of aggression can be especially impactful. In adolescence, youth move away from parental control and begin to place increasing value on peers' views and opinions (Berndt, 1979; LaFontana & Cillessen, 2010). Thus, peers' influence on behaviors, as well as the importance youth place on their peer relationships, are particularly strong during this developmental period. Further, as youth move into middle school, they are required to manage more complex social and structural situations, with a referent peer group that has increased in both size and complexity relative to elementary school (Seidman & French, 2004; Wigfield, Eccles, Iver, Reuman, & Midgley, 1991). This is problematic in terms of aggression because of peers' inherent involvement in aggressive behavior. That is, peers play important roles in the enactment

of aggressive behavior, both actively (i.e., supporting the aggressor or defending the victim) and passively (i.e., simply being present during aggressive acts; Salmivalli et al., 1996). These roles are likely more pronounced in adolescence, compared to younger ages, because of the increasing importance youth place on peers during adolescence and the increasing complexity of peer relationships and social structures. Therefore, not only is early adolescence a particularly challenging developmental period in terms of the prevalence of aggression, but it is also a time when the impact of peer relationships on aggression is especially strong.

Although peers are clearly important in terms of the use of aggression, not all peer relationships are created equally. With whom aggressors interact seems to matter (e.g., Dijkstra et al., 2011; Poulin et al., 1999), the structure of aggressors' relationships seems to matter (e.g., Ahn, Garandeanu, & Rodkin, 2010; Faris & Felmlee, 2011), and the interactional experiences that aggressors have seem to matter (e.g., Dishion, Spracklen, Andrews, & Patterson, 1996; Dodge, 1983). In other words, it is the nuances in relationships that are critical to our understanding of youth's aggression. Yet, there are significant areas of confusion, or even disagreement, with regard to these nuances in the relationships that aggressors have – disagreement that leads to unanswered questions. For instance, why do some friendships encourage and others inhibit the use of aggression? How does aggression impact the formation of new relationships? How do aggressor-victim relationships develop and why are some aggressor-victim relationships particularly significant and long lasting? Using a variety of perspectives applicable to my relational focus on aggression (e.g., a social networks approach, a dyadic perspective and analyses), this dissertation is designed to address the contradictions inherent in the extant

literature and answer these questions. These issues will be addressed in a series of three empirical studies.

In Study 1, I will examine how qualities of youth's close friendships contribute to the use of aggression, both concurrently and over time. In Study 2, I consider the precursors to aggressors' friendships with peers. Specifically, I will explore youth's interactions with unfamiliar peers, and assess how aggression impacts the interactions that unfold, as well as how this affects the quality of the relationship. The first two studies concern aggressors' relationships with their friends (Study 1) and acquaintances (Study 2). In contrast, Study 3 focuses on a different type of relationship – the relationship between an aggressor and his or her victim(s). In the third study, I will explore how power dynamics operate within an aggressor-victim dyad and assess whether differences in the power differential between the aggressor and victim affect the strength of their relationship. Across these studies, I consider close friendships, aggressor-victim relationships, and unfamiliar peers, in order to assess breadth across types of relationships. Further, I use diverse and sophisticated methodologies and analytic techniques to develop a depth of understanding regarding the nature of these relationships. Together, these three studies will provide insight into the qualities of youth's peer relationships and how these qualities contribute to the use of aggression, as well as how the use of aggression impacts peer relationships. This is central to the ultimate goal of understanding and decreasing aggressive behavior.

CHAPTER 2

STUDY 1: A NETWORK PERSPECTIVE ON THE RELATION BETWEEN FRIENDSHIPS AND ADOLESCENT AGGRESSION

Rates of aggression are relatively high in adolescence, and some youth increase their use of aggression during this developmental period (Loeber & Hay, 1997; Moffitt, 1993). However, not all youth increase in aggression at the same rate; in fact, some show decreases in aggression (Pepler, Jiang, Craig, & Connolly, 2008; Underwood, Beron, & Rosen, 2011). These differences may be explained, at least in part, by examining the relationship(s) that adolescents have with their friends. Adolescents spend a great deal of time with friends and are substantially impacted by those friends (Berndt, 1979; Crockett, Losoff, & Petersen, 1984). That impact can be both positive and negative (Berndt, 1992), and friends can either exacerbate or mitigate youth's own aggressive behavior (Adams, Bukowski, & Bagwell, 2005; Dijkstra et al., 2011; Poulin et al., 1999).

Although friends are clearly implicated in youth's use of aggression, friendships have largely been viewed using a dyadic lens. That is, much of the extant research focuses on the relationship between an adolescent and his or her single best friend, emphasizing how a friend's aggression is relevant to youth's own aggression (e.g., Adams et al., 2005). Although this provides an important starting point for understanding how friends can impact youth's aggression, it is lacking in that it only allows for the influence or effect of a single friend. This is problematic because youth's peer relationships are more complex than this. For instance, many youth have friendships with multiple peers (Berndt & Hoyle, 1985; Gest, Graham-Bermann, & Hartup, 2001). In addition, dyadic friendships do not occur in isolation; one's friends may be friends with

one another (Goodreau, Kitts, & Morris, 2009). Thus, friendships can be viewed, not only as a dyadic relationship between two individuals, but also as interrelationships among a number of individuals within a friendship network. This perspective is supported by social network models, wherein not only are one's friends important, but friends of those friends and the relationships among those friends are important as well (Adler & Adler, 1995; Moody & White, 2003; Wasserman & Faust, 1994). Specifically, a social networks perspective highlights the importance of examining the pattern of relationship ties one has; that is, the direct friendship ties one has and the relationship ties among friends. These structural features of the friendship network speak to the way in which friendships are organized and how youth interact with one another, and as such, may be associated with both the concurrent and prospective use of aggression.

From a social networks perspective, friendships can be viewed as avenues through which information and influence can flow (e.g., behavioral influence; Ahn et al., 2010; Choi & Kim, 2008; Wasserman & Faust, 1994). Thus, not only are the structural aspects of one's friendship network important, but also important are the specific behaviors being exhibited and *passed on* by one's friends. Given the link between friends' aggressive behavior and one's own aggressive behavior (Adams et al., 2005; Dijkstra et al., 2011; Poulin et al., 1999), it seems likely that friends' aggressive behavior may be involved in the link between structural friendship features and youth's aggression. That is, the effect of structural features of the friendship network on youth's aggressive behavior may be moderated by the extent to which friends themselves exhibit aggression. Viewing friendships in this more complex, multifaceted manner allows for an understanding of

how both structural and behavioral features of youth's friendship networks are associated with youth's aggressive behavior.

In the current study, I draw on a social networks perspective to consider concurrent and prospective relations between the structural features of youth's friendship networks (the number of friends one has and the relationships among those friends) and the use of aggressive behavior. Further, I consider the moderating role of friends' aggressive behavior. Together, the structural and behavioral dimensions of youth's friendships provide a more complete view of the potential impact friends have on youth's behaviors than can be gleaned from examining dyadic friendships alone.

Structural and Behavioral Friendship Features in Association with Aggression

Those who are closest to an individual, and who have the strongest ties to an individual, are likely more salient and important to the individual than distant peers (i.e., acquaintances; Brown, Bakken, Ameringer, & Mahon, 2008; Shi & Xie, 2012). Thus, close and reciprocated friends (i.e., both individuals view the other as a friend) likely have a strong impact on an individual's behavior (Giletta et al., 2012; Hartup, 1999; Simpkins & Parke, 2002). Such close friendship ties can be found in the *local friendship network*, or one's direct friendships. These are one's immediate friends, rather than a friend of a friend or a more distant acquaintance.

The structural features of this local friendship network – namely, the number of friends one has and the interconnectedness of those friends – are the fundamental, organizing factors that characterize one's relationships. That is, the organization of one's friendship network can impact with whom one interacts and the ways in which these friends interact. Given the inherently social nature of aggression and peers' frequent

involvement in aggression (Craig et al., 2000; Salmivalli et al., 1996), number of friends and friends' interconnectedness likely impact youth's aggressive behavior. However, extant literature presents conflicting explanations as to the valence of these associations. For instance, having more friends may be associated with increased (e.g., Huttunen, Salmivalli, & Lagerspetz, 1996; Perren & Alsaker, 2006) or decreased aggression (e.g., Hektner, August, & Realmuto, 2000). Similar conflicting accounts are present when examining the potential association between interconnectedness and aggression (e.g., Ahn & Rodkin, 2014; Green, Richardson, & Lago, 1996). Given that friends' behavioral characteristics can also impact one's own aggressive behavior (e.g., Ahn et al., 2010; Choi & Kim, 2008), perhaps the aggressive nature of one's friends (i.e., how aggressive one's friends are) moderates the association between structural features of the friendship group and the concurrent and subsequent use of aggression.

Friendship group size and aggression. There are mixed findings concerning the link between number of friends and aggression. For instance, some have found that aggressors belong to larger social networks (i.e., groups of children who were nominated as being friends with one another) than youth who are not aggressive (Boulton, 1999; Huttunen et al., 1996; Perren & Alsaker, 2006; Salmivalli, Huttunen, & Lagerspetz, 1997). In fact, aggression has been described as a way to gain friends; relational aggression, in particular, may be used to strengthen social bonds (e.g., gossiping about a third peer to strengthen one's connection with a friend; Adler & Adler, 1995; Merten, 1997). Conversely, others have found that aggression is associated with having few friends (Dodge, 1983; Rose, Swenson, & Carlson, 2004; Rys & Bear, 1997). Hektner et al. (2000) found that not only did aggressive youth have few friends, but also they were

more likely to lose friends over the course of a six week summer camp than youth who were not aggressive.

These mixed findings may be explained by considering the behavioral characteristics of one's friends: specifically, friends' aggressive behavior. According to the popularity-socialization hypothesis, those who have many friends feel more compelled to mimic the actions of their peers than do those who have fewer friends and are more removed from the peer group (Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Santor, Messervey, & Kusumakar, 2000; Schwartz & Gorman, 2011). That is, it is expected that those with many friends feel increased pressure to conform to their friends' behavior (e.g., Schwartz & Gorman, 2011). If that behavior is *aggressive*, then youth with many friends might be especially likely to increase their own aggressive behavior. If friends' behavior is *not* aggressive, it seems less likely that the individual would increase his or her aggressive behavior. Further, for those with fewer friends overall (and thus less pressure to conform to their peers), friends' aggressive behavior may play less of a role in youth's own aggressive behavior.

Interconnectedness and aggression. One's friends may frequently be friends with one another (e.g., Goodreau et al., 2009). The relationships among one's friends can be measured as *interconnectedness*, representing the density of relationships within a friendship group, or cohesion within a friendship group (Burt, 1978; Moody & White, 2003; Neal, 2010; Wasserman & Faust, 1994). Some research has examined this type of construct at the level of the peer group, focusing on cliques, clusters, or *friendship circles* – groups of youth who are close and connected, perhaps all friends with one another (e.g., Adler & Adler, 1995; Closson, 2009; Ellis & Zarbatany, 2007; Peeters, Cillessen, &

Scholte, 2010). However, even within a clique, some members may have different friendship connections than others (i.e., some clique members are more central to the group, whereas others are at the periphery and have fewer relationships; e.g., Xie, Swift, Cairns, & Cairns, 2002). Thus, rather than examine the interconnectedness of the clique as a whole, it is important to examine interconnectedness at the individual level. As of yet, this has rarely been done in relation to aggression (see Green et al., 1996 for a notable exception). Thus, in the current study, we will assess the interconnectedness (the proportion of one's friends who are also friends with one another) within each individual's local friendship network.

As with the number of friends, mixed findings have been reported regarding the association between interconnectedness and aggression. For instance, having a dense group of friends is thought to be related to high levels of aggression because the structure of a densely connected social network provides more opportunities to use aggression against others in the group (Green et al., 1996; Lagerspetz, Bjorkqvist, & Peltonen, 1988). For example, in highly interconnected groups, gossiping about a group member to others members of the group would spread more quickly than it would in groups with fewer interconnections, and thus enhance one's ability for social control and manipulation. As such, having a very dense and interconnected group of friends may be particularly problematic in terms of increasing the aggression used within these networks. However, these theoretical explanations have seldom been empirically tested. In a study of college students, Green et al. (1996) found that those in higher density peer networks (measured as the extent to which people with whom participants were in relationships

knew one another) used more aggression than those in lower density networks, although this was only the case for males.

Conversely, others have suggested that such well-connected groups might promote well-being through social cohesion and trust (Ahn & Rodkin, 2014; Coleman, 1988; Putnam, 2007). That is, individuals within a group of highly interconnected, well-bonded friends might have an increased sense of *collective well-being* (Ahn & Rodkin, 2014; Coleman, 1990). It has been stated that this interconnectedness and sense of cohesion helps to establish trust and feelings of closeness among members of the group (Coleman, 1990). Where there is greater trust and closeness, there may be less desire and need to engage in aggressive behaviors. Thus, a highly interconnected friendship group may serve to decrease aggressive behavior because members of the interconnected group feel a sense of well-being and trust. To our knowledge, these ideas have not been empirically tested in relation to aggression.

As with number of friends, the association between interconnectedness and aggression may depend on how aggressive one's friends are. For instance, in highly interconnected friendship groups wherein members are *not* aggressive, the group may be high in trust, closeness, and may even develop norms against aggression (Ahn & Rodkin, 2014; Coleman, 1990). Conversely, in tight-knit groups wherein members are *high* in aggression, the interconnectedness of the group may exacerbate already high levels of aggression (i.e., there are more connections among group members and thus more opportunities to engage in aggression; Green et al., 1996). However, empirical work has not (to my knowledge) addressed these questions.

The Current Study

Although both size and interconnectedness of one's local friendship network appear to play a role in youth's use of aggressive behavior, the contradictory arguments stated above suggest that the associations remain unclear. Thus, the aim of the current study was to determine how size and interconnectedness of the local friendship network related to aggressive behavior, and to examine whether these associations were moderated by the friends' aggressive behavior. Given the lack of extant empirical research, particularly in terms of interconnectedness, the first goal was to examine these associations concurrently, to determine whether (and how) structural and behavioral features of the friendship network related to aggression. The second goal was to expand upon this and determine whether structural and behavioral features of the friendship network related to change in aggression over time. It was hypothesized that youth with more friends would use more aggression, but only for those whose friends were also aggressive. Similarly, it was hypothesized that, for those whose friends were highly aggressive, the greater the interconnectedness among one's friends, the greater the aggression. Conversely, for those whose friends were not aggressive, higher interconnectedness was expected to be associated with less aggression. These aims were addressed using a sample of ethnically diverse sixth to eighth grade middle school students. By adopting a social networks perspective and considering the complexity of youth's friendships, this study provides a nuanced and in-depth examination into how friendships affect the use of aggressive behavior.

Method

Participants

Participants were sixth to eighth grade students drawn from a large, three wave longitudinal study of early adolescents. Data were collected from students in an ethnically diverse southwestern United States middle school in the spring of year 1 (Wave 1), fall of year 2 (Wave 2), and spring of year 2 (Wave 3). Data for the present study were drawn from the second and third waves (note: key measures were not included in the first wave). All students in the middle school ($N = 1056$) were recruited for participation by distributing information letters and consent forms (printed in both English and Spanish) to families. This study employed passive consent, meaning that parents could choose to opt their child out of participation in the study. Recruitment procedures were approved by the participating school and the university Institutional Review Board.

Of the 1056 potential participants, 59 parents requested that their child not participate, 4 students refused participation at the time of the survey administration, 17 students had withdrawn from the school by the time of survey administration, and 18 students were absent from school during survey administration. This resulted in a final sample at Wave 2 of $N = 958$ participants (91% participation rate; $Ns = 340$ sixth graders, 302 seventh graders, and 316 eighth graders). Participants ranged in age from 10 to 14 years ($M = 12.10$ years, $SD = .99$, 49.9% girls), and came from ethnically diverse backgrounds (children self-identified as Latino [44%], White [20%], Black or African American [18%], American Indian or Alaska Native [9%], Asian [3%], and other [6%]). The majority of adolescents were from low socioeconomic status families, as indicated

by students' free and reduced lunch status, provided by the school district (79% were eligible for free lunches, 9% were eligible for reduced-price lunches). Participants reported speaking English (45%), Spanish (8%) or both English and Spanish (44%) at home. The remaining 3% reported speaking other languages at home, including Vietnamese, Arabic, Marshallese, and Navajo. Approximately half (46%) of participants and their parents were United States (U.S.) born, 12% of participants were U.S. born with one parent foreign born, 30% were U.S. born with both parents foreign born, and 12% were foreign born with both parents foreign born. Finally, 45% of participants came from two-parent married families, 33% came from single parent families, and 16% came from two-parent, unmarried families (6% of participants reported that they did not know their parents' relationship status).

Of the 958 who participated at Wave 2, 84 had withdrawn from the school by Wave 3. An additional 44 were absent from school during school administration (note that these participants were included in analyses because they were able to be nominated by peers at Wave 3; thus the analytic sample included $N = 874$). As such, 830 of those who participated at Wave 2 also participated at Wave 3 (87% retention rate). The participants from Wave 2 who did not participate at Wave 3 were compared to retained participants; *t*-tests indicated that participants did not differ based on demographic information, with the exception of generational status (retained participants were more often foreign born with both parents foreign born, $t[952] = 2.11, p < .05$, or US born with both parents foreign born, $t[952] = 2.02, p < .05$, than participants who left after Wave 2).

Procedure

At each wave of data collection, participants completed a paper-and-pencil questionnaire in their classrooms. Each item in the questionnaire package was read aloud by trained research assistants. Individualized assistance was provided as needed to adolescents who had difficulty completing the questionnaires (e.g., students with learning disabilities or language difficulties). The questionnaire package was administered on two consecutive days, and took approximately two hours to complete. The items used in the present study were completed on the second day of administration. Students received a small gift (a bracelet with the school's logo at Wave 2; a water bottle with the school's logo at Wave 3) as a token of appreciation for completing the survey.

To measure aggression and characteristics of friendship groups, peer nomination procedures were utilized (Farmer, Estell, Leung, et al., 2003; Peeters et al., 2010). To complete the peer nominations, students were given a list of all peers in their grade (containing peers' first and last name, as well as a unique identifying number [ID] that was created for the study) and were instructed to nominate peers in their grade that fit each description (i.e., friend, aggressor). Participants were asked to record the peers' first name, last initial, and ID number. Participants were told that they could not nominate themselves, but that they could nominate the same person for more than one description. If they could not think of peers who fit a particular description, they were instructed to leave the space blank.

Measures

Identifying local friendship networks. Participants were asked to nominate up to 10 of their closest friends in their grade. Identifying friends at the grade-level is

beneficial because, unlike elementary school, wherein the entire network of peers is within the same classroom, in middle school, the peer network is typically the entire grade (i.e., youth interact with many others within the entire grade-level peer group). As such, allowing for nominations at the grade level prevents individuals' friendships from being artificially truncated into smaller groups.

Size (i.e., number of friends). Number of friends was calculated as the total number of reciprocated friendship nominations made between peers (i.e., peer *i* nominated peer *j* as a friend, and *j* also nominated *i* as a friend). That is, the size of one's friendship group was computed as a count of the number of reciprocated friendship ties (Wasserman & Faust, 1994). Reciprocated friendship ties (i.e., both members of the friendship view the other as a friends) are indicative of intimacy and support within the relationship (Buhrmester, 1990), and thus were used in the current study to denote a friendship.

Interconnectedness. Interconnectedness among friends was calculated based on the same friendship nominations described above. This measure was calculated as the number of friends in an individual's local friendship network who had reciprocated ties between one another, divided by the total possible number of ties among those friends. That is, the numerator of the equation was the number of friends who were friends with one another. The denominator of the equation was the total possible number of friendships in an individual's friendship group, calculated as $(n(n-1))/2$. For example, an individual with five friends and two (reciprocated) friendship ties between those friends would have an interconnectedness score of $2 / (5(5-1))/2 = 2/10 = .2$. An individual with

five friends, with eight friendship ties among those friends would have an interconnectedness score of $8 / 10 = .8$, thus representing greater interconnectedness.

Aggression. Wave 2. Aggression was assessed using a peer nomination measure of aggression. This measure consisted of three items, with one item assessing each form of aggression – relational, physical, and verbal aggression (i.e., “Someone who gossips about others or excludes others,” “Someone who hits, kicks, or pushes others,” “Someone who calls others names or laughs at them,” respectively). These items used have been frequently used to assess aggression and show large correlations or alphas when used in combination with other items (e.g., Farmer et al., 2003; Peeters et al., 2010). Students were able to nominate up to three peers for each form of aggression. The total number of nominations received by each participant was summed to yield total aggression scores.

Wave 3. At Wave 3, a similar peer assessment of aggression was utilized, however this measure only contained one item. The use of a single item is common in peer reports of aggressive behavior (Cillessen & Mayeux, 2004, 2007; Juvonen, Wang, & Espinoza, 2013; Peeters et al., 2010), and because each individual could be nominated by all peers, no peers, or any number of peers in between, there is still great variability in scores even when using one item. Participants were first presented with a definition of aggression, which contained the items for relational, physical, and verbal aggression described above. Participants were then asked to nominate up to three peers who fit that description. As with aggression at Wave 2, the number of nominations each person received was summed to create an aggression score at Wave 3.

Friends’ average aggression. The aggressiveness of each participant’s friends was calculated based on friends’ average level of aggression. That is, each friend had a

score on aggression (based on the peer nominations described above). The aggression score for each friend within an individual's local friendship network was averaged across friends (i.e., calculated as the average aggression score of an individual's friends, and did not include the individual's aggression score).

Covariates. Demographic variables (self-reported gender, grade, and ethnicity) were used as covariates. Further, in order to account for some of the complexity in friends' aggressive nature while assessing the impact of friends' average aggression on youth's own aggression, two additional variables were calculated and used as covariates. For instance, an individual might have one highly aggressive friend and one non-aggressive friend, while a second individual has two moderately aggressive friends. Each individual would receive the same score for friends' average aggression. Thus, I calculated a variable representing the proportion of each individual's friends who were highly aggressive: *proportion of highly aggressive friends*. Based on a cut-off score on aggression in the overall sample (number of nominations as an aggressor ≥ 4 , which represents scores that were $\geq \frac{1}{4} SD$ above the mean), I calculated the number of friends who score above this threshold on aggression, divided by one's total number of friends. Past research has used a variety of cut-off scores to classify highly aggressive individuals, ranging from less stringent (≥ 2 nominations) to more stringent ($\geq \frac{1}{2} SD$ above the mean) (Rodkin & Berger, 2008; Schwartz, 2000). I chose a cut-off of 4 nominations ($\frac{1}{4} SD$) that falls within this range and represents the data well (e.g., average aggression was 2.75 nominations with many individuals nominated 0 times).

I also considered, for example, that an individual might have three highly aggressive friends, all of whom have 10 nominations as an aggressor. A second

individual might also have three highly aggressive friends, one with 5, one with 10, and one with 15 nominations as an aggressor. In this case, these individuals would receive the same score for friends' average aggression as well as for proportion of highly aggressive friends, despite the fact that their friends are clearly different in terms of their variability in aggression. Thus, I calculated the standard deviation of each individual's friends' aggression, to create a measure of *variability in friends' aggression*.

Results

The aims of this study were to understand how structural features of the local friendship network (i.e., size and interconnectedness) impacted aggression both concurrently and over time, and to assess moderation by the aggressiveness of one's friends. It was hypothesized that youth with more friends would use more aggression (both concurrently and over time), but only when those friends were themselves aggressive. Conversely, youth with fewer friends were expected to use more aggression than those with many friends, when friends were less aggressive themselves. Similarly, it was hypothesized that, for those with highly aggressive friends, having a more interconnected friendship network would be associated with more aggression (concurrently and over time), whereas the reverse was expected for those whose friends were less aggressive. To assess these aims, path analyses in *Mplus* were conducted to predict aggression (concurrently and over time) from the size and interconnectedness of one's local friendship network. Further, I assessed whether friends' aggression moderated these associations.

Descriptive Analyses

Study variables were assessed for normality; aggression (at both Waves 2 and 3) and friends' average aggression were log transformed to better approximate normality (Tabachnick & Fidell, 2007) (see Table 1 for means and standard deviations of study variables). Several variables were included as covariates in analyses, including demographic variables (gender, grade, and ethnicity) as well as additional indicators of friends' aggressive nature (proportion of highly aggressive friends and variability in friends' aggression). Demographic variables were dummy coded: girls served as the reference group for gender (50% girls), sixth grade served as the reference group for grade (35% sixth grade, 31% seventh grade, 34% eighth grade), and Latino served as the reference group for ethnicity (45% Latino, 20% White, 18% Black, 17% other). Proportion of highly aggressive friends ranged from 0 to 1 ($M = .26$, $SD = .32$). Variability in friends' aggression ranged from 0 to 23.46 ($M = 2.54$, $SD = 2.75$); variability in friends' aggression was highly skewed, and thus was log transformed to better approximate normality.

Zero-order correlations among variables are presented in Table 2. Correlations indicated that size of the local friendship network was positively associated with aggression at Wave 2, and interconnectedness was negatively associated with aggression at Wave 3. Friends' average aggression was positively associated with aggression at both waves. Size was positively associated with friends' average aggression, but was not significantly associated with interconnectedness. Further, interconnectedness was not significantly associated with friends' average aggression. Table 2 also shows correlations among covariates, as well as correlations between covariates and study variables.

Because correlations among some variables were quite high (i.e., friends' average aggression, proportion of highly aggressive friends, and variability in friends' aggression), the variance inflation factor was calculated for each predictor variable to assess multicollinearity. Values for all variables were ≤ 5.25 , which falls below the commonly recommended cut-off of 10 (Cohen, Cohen, West, & Aiken, 2003).

Concurrent Associations between Structural and Behavioral Features of the Local Friendship Network and Aggression

To assess how structural features of the local friendship network were associated with aggression concurrently, as well as to assess moderation by friends' aggression, a path analysis was conducted in *Mplus 7* (Muthén & Muthén, 2012). Full information maximum likelihood estimation was used to account for missing data. Paths were specified from friendship network size, interconnectedness, and friends' average aggression to Wave 2 aggression. As suggested by Aiken and West (1991), predictors were group-mean centered prior to running the path model. Interaction terms were created by multiplying structural variables (i.e., size and interconnectedness) by friends' average aggression. Significant interactions were probed by holding the moderator (friends' average aggression) constant at the centered mean, and at one standard deviation above and below the centered mean. The slopes of simple regression lines of the structural variables on aggression were calculated separately at those values of the moderator. Paths were specified from demographic covariates (dummy-coded gender, grade, and ethnicity) to Wave 2 aggression. Covariances between demographic variables were specified to equal 0 (note that the covariances between the dummy coded indicator of White and the dummy coded indicators of seventh and eighth grades were allowed to

freely covary based on a poor fitting initial model and modification indices above 10). Paths from proportion of highly aggressive friends and variability in friends' aggression to Wave 2 aggression were also specified.

The concurrent path model fit well, $\chi^2(9) = 13.16, p > .05$, CFI = .97, SRMR = .01, and RMSEA = .02 (90% CI: .00 – .05). The model indicated that boys were higher in Wave 2 aggression than girls, and seventh and eighth graders were lower in aggression than sixth graders (see Table 3). In terms of the main study variables, those with larger local friendship networks were higher in aggression, but interconnectedness was unrelated to aggression at Wave 2. Those with friends who were higher in aggression were higher in aggression themselves. Finally, there was a marginally significant interaction ($p = .08$) between size and friends' average aggression. I probed this interaction in order to gain a better understanding of the associations between structural and behavioral features of the local friendship network on youth's aggression. Probing this interaction indicated that having a larger local friendship network was associated with higher aggression, but that this was particularly true for those whose friends were average ($b = .03, p < .05$) or high ($b = .06, p < .01$) in aggression, and not so for those who friends were low in aggression ($b = .00, p > .05$).

Longitudinal Associations between Structural and Behavioral Features of the Local Friendship Network and Aggression

To assess whether structural features of the local friendship network predicted aggression over time (and whether this was moderated by friends' aggression), a similar path model was assessed. Here, paths were specified from friendship network size, interconnectedness, friends' average aggression, and interaction terms to Wave 3

aggression. Further, a path was specified from Wave 2 aggression to Wave 3 aggression. Thus, this model tested the association between structural and behavioral features of the local friendship network on aggression at Wave 3, accounting for previous levels of aggression. As in the previous model, paths were specified from covariates (gender, grade, ethnicity, proportion of highly aggressive friends, and variability in friends' aggression) to Wave 2 aggression. Also as before, covariances between demographic variables were specified to equal 0, except for the covariances between the dummy coded indicator of White and the dummy coded indicators of seventh and eighth grade.

The longitudinal model also fit well, $\chi^2(17) = 26.51, p > .05$, CFI = .98, SRMR = .02, and RMSEA = .03 (90% CI: .00 – .04). As with the concurrent model, the longitudinal model indicated that seventh and eighth graders were lower in aggression than sixth graders (see Table 3). Further, those with a higher proportion of highly aggressive friends and those with more variability in their friends' aggression were higher in Wave 3 aggression. Wave 2 aggression was also significantly positively associated with Wave 3 aggression. Turning to the main study variables, size of the local friendship network did not significantly predict Wave 3 aggression, after accounting for Wave 2 aggression. However, interconnectedness did; those with less interconnectedness among friends in their local friendship network were higher in aggression at Wave 3, accounting for their aggression at Wave 2. As before, those with friends who were higher in aggression were also higher in aggression themselves at Wave 3.

Discussion

Given the importance of friendships during early adolescence and the potential that friendships have to impact youth's aggression (Adams et al., 2005; Dijkstra et al.,

2011; Poulin et al., 1999), I adopted a social network perspective and considered how structural and behavioral features of one's local friendship network were associated with aggression. I assessed associations between size, interconnectedness, friends' aggression, and one's own aggression, both concurrently and over time. Findings indicated that, concurrently, youth with larger friendship networks were involved in more aggression, and this was particularly true for those whose friends were highly aggressive.

Longitudinally, interconnectedness emerged as a protective factor; those with more interconnected local friendship networks decreased in aggression over time. Theoretical and practical implications of these findings are discussed below.

Size of the Local Friendship Network

When considering concurrent associations between friendship group size and aggression, those with larger friendship networks were more aggressive. This supports extant research that has similarly found that aggressors have larger social networks than non-aggressors (Boulton, 1999; Huttunen et al., 1996; Perren & Alsaker, 2006; Salmivalli et al., 1997). However, this association was only found concurrently. Thus, it may be that friendship network size more closely relates to ongoing interactional processes associated with aggression than it does to the longitudinal impact on tendencies toward aggression over time. That is, perhaps having a larger local friendship network provides youth with more access to peers toward whom they can aggress. It maybe that youth aggress against their own friends (Mishna, Wiener, & Pepler, 2008; Waasdorp, Bagdi, & Bradshaw, 2010; Wei & Jonson-Reid, 2011), or it may be that having many friendship connections affords youth the ability to interact with more peers (i.e., friends of friends). Thus, whether aggressors engage in aggression toward their own friends or toward other peers

within the social group, it may be that having a larger friendship network provides youth more opportunity and more access to peers. This type of access would be relevant to peers' concurrent use of aggression, yet may not impact the tendency for youth to change in aggression over time.

Though this concurrent main effect (i.e., larger friendship networks were associated with higher aggression) is empirically supported, it also stands in contrast to some extant research that suggests highly aggressive youth have few friends (e.g., Rose et al., 2004; Rys & Bear, 1997). The difference in findings might be explained by methodological differences in the measurement of friendship nominations. For instance, both Rose and colleagues and Rys and Bear limited friendship nominations to three friends, which may artificially truncate peer networks. In the current study, youth reported having from 0 to 10 reciprocated friends, with nominations limited to a maximum of 10 friends. Perhaps the relations between friendship group size and contemporaneous aggression are only evident when the full range of the scale is considered. If this is the case, allowing youth to report the full range of friendship nominations may be optimal to gain a more ecologically valid view of one's relationships. In fact, perhaps future work could consider unlimited friendship nominations, which might provide an even stronger test than what was done here by limiting youth to reporting 10 friends. However, of the current sample of 874 youth, only 1 reported the maximum number of 10 reciprocated friendships. Thus, I feel fairly confident that limiting friendship nominations to 10 friends provides a reasonable view of youth's local friendship network.

Finally, when considering friendship network size, I found a marginally significant interaction, such that larger friendship networks were associated with higher aggression (again, concurrently), and this was particularly true for those whose friends were high in aggression. This tentatively supports the popularity-socialization hypothesis (Allen et al., 2005; Santor et al., 2000; Schwartz & Gorman, 2011). That is, it may be that those with many friends feel increased pressure to conform to group norms and behaviors exhibited by those friends, which in this case was a high level of aggression. This finding might alternatively suggest a *social dosage* effect, such that the more exposure an individual has to aggressive peers, the more that individual will be influenced by those peers (i.e., become more aggressive him or herself; Martin & Fabes, 2001). That is, youth are influenced by their aggressive friends to behave aggressively (e.g., Adams et al., 2005; Dijkstra et al., 2011; Poulin et al., 1999), and having a large number of these aggressive friends increases the *dosage* of that influence. In fact, studies have shown that aggressors often have *reinforcers* who support their use of aggression (Huitsing & Veenstra, 2012; Salmivalli et al., 1997). Thus, it might be that many highly aggressive friends reinforce one's use of aggression, which encourages the individual to engage in higher levels of aggression. It is important to note, however, that this theoretically supported interaction was only marginally significant. Thus, more work is needed to clarify whether this finding holds using other samples, and whether the popularity-socialization hypothesis or the social dosage effect may truly explain the link between friends, friends' aggressive behavior, and one's own aggression.

Interconnectedness

Although concurrent results did not indicate that interconnectedness related to youth's use of aggression, longitudinal results did. Specifically, more interconnectedness was related to less aggression several months later, after accounting for prior levels of aggression. Others have suggested that interconnected friendship groups can promote trust and cohesion (Ahn & Rodkin, 2014; Coleman, 1988; Putnam, 2007). In an interconnected friendship group, many members of one's local friendship group are also connected with one another (Burt, 1978; Wasserman & Faust, 1994). That is, as a group, there are friendship ties among many members, creating a structure that may be more cohesive than a less interconnected group. Highly interconnected friendship groups might provide the structure, or the foundation, through which good quality, positive relationship can form. Perhaps it is through these connections among close friends that trust, cohesion, and a sense of connection builds, and thus, one's motivation and need to use aggression decreases. The results of the current study hint that this could be true. Further, I did not find evidence of moderation by friends' aggression. That is, although it was expected that interconnectedness might only be associated with less aggression when friends were low in aggression, I found that interconnectedness was associated with decreased aggression regardless of friends' use of aggression. This suggests that the protective effect of an interconnected group is quite strong; even when one's friends are aggressive, building connection and trust within a friendship network is effective in reducing aggression. This important finding can be used to decrease aggression in schools and neighborhoods. For instance, parents and teachers can focus on the structural

features of the friendship network and encourage interconnections among friends as a way to decrease youth's aggression.

Interestingly, interconnectedness was only associated with less aggression longitudinally (although it should be noted that the concurrent association between interconnectedness and aggression was also negative, but did not reach significance). Perhaps I found longitudinal but not concurrent results because a tightly interconnected group grows to trust one another over time, thus this type of collective well-being may not fully impact the use of aggressive behavior until it has been established for some time. That being said, it is unknown if youth's interconnected friendships at Wave 2 are the same friendships they have at Wave 3. That is, even though it is assumed that a highly interconnected group of friends might grow in strength and connectivity over time (and increasingly impact aggression), it is possible that friendships networks (even highly interconnected friendship networks) changed over time. Future research could explore this possibility more fully, and determine whether and how *changing* social groups and the interconnected nature of changing social groups impact changes in aggression.

Though findings are supported by hypotheses made pertaining to group cohesion, they are contrary to past research suggesting that such interconnected friendships may promote aggression. That is, some researchers suggest that in interconnected groups, youth have more opportunities to use aggression against one another (Green et al., 1996; Lagerspetz et al., 1988). For instance, gossip might spread quickly within a highly interconnected friendship group, more so than it might when one's friends are not friends with one another. However, this hypothesis assumes that aggression is occurring *within* the friendship group; that is, an aggressor gossips about a friend to another friend within

the friendship network, and this gossip spreads quickly among the interconnected friendship network. In the current study, I did not assess whether aggression was directed toward group members or was directed to others outside of the immediate friendship group. This may explain why this effect was not supported by current results.

Limitation and Future Directions

In the current study, friendships were defined using reciprocated friendship nominations, meaning that each individual had to pick one another for there to be considered a friendship. I chose this definition of a friendship because it is the most stringent and because past research has suggested that reciprocated friendships are most indicative of intimacy and support within the relationship (Buhrmester, 1990). It is possible that different results would be found using alternate conceptualizations of friendships (e.g., only considering incoming ties, or only considering outgoing ties). For instance, if popular youth feel increased pressure to engage in aggressive behavior in order to conform to group norms, it may be that considering incoming ties would provide stronger results. That is, having many peers choose an individual as a friend is likely indicative of high popularity, regardless of reciprocation. However, when considering the interrelations and interconnected nature within a group of friends, perhaps reciprocated friendships are required to promote a sense of group cohesion and trust. Thus, for example, the current results regarding interconnectedness may be stronger than what would be found if non-reciprocated friendships were used to identify ties. Future work could examine these patterns, and gain a better sense of how different types of friendship relationships (i.e., reciprocated friends versus non-reciprocated friends) operate differently in relation to aggression.

I hypothesized mechanisms through which structural features of the local friendship network would impact aggressive behavior, but did not test these mechanisms directly. For instance, although results offer some support for the notion that having many friends (especially highly aggressive friends) may increase youth's feelings of pressure to conform to group norms, (Allen et al., 2005; Santor et al., 2000; Schwartz & Gorman, 2011), neither the group norms nor youth's motivation to conform to these norms were assessed. Similarly, the results suggested that having a highly interconnected friendship network may promote feelings of trust and cohesion at the group level (Ahn & Rodkin, 2014; Coleman, 1988; Putnam, 2007) and this cohesion subsequently decreases youth's involvement in aggression, but again these mechanisms were not assessed. Thus, the current study provides an important starting point for better understanding how the structural features of the friendship network can impact aggression, yet more work is needed to directly test the potential mechanisms involved in these associations.

A slightly different measure of aggression was used at each time point. Specifically, a greater number of aggressors could have been nominated at Wave 2 than Wave 3. Thus, it may be that those nominated as aggressors at Wave 3 represent only the most visible and salient aggressors, and thus do not account for youth who are less visible in their aggression or use aggression less frequently. This slight measurement difference means that longitudinal results need to be qualified. For instance, I cannot truly say that greater friendship group interconnectedness *decreased* youth's aggression over time. However, controlling for prior levels of aggression (measured slightly differently), greater friendship interconnectedness was associated with lower aggression at a later time in the school year. This measurement difference may have also impacted the differences

found between concurrent and longitudinal results. Future research could focus on additional longitudinal work, including longitudinal work across a longer time period (e.g., across the years in middle school, rather than just within one school year) to gain a better understanding of the impact of structural and behavioral friendship network features in relation to *changes* in aggression.

Implications and Conclusions

Taken together, results indicate that having a larger friendship network may be implicated in the use of aggression concurrently, yet having a more interconnected friendship network may serve to decrease aggression over time. It is possible that friendship network size is implicated in the concurrent use of aggression because it directly impacts the frequency of one's interactions (i.e., the availability and opportunity for aggression), whereas the protective effect of having an interconnected friendship network increases as friends grow to trust one another over time. However, more work (particularly work more stringently testing changes in aggression over time) is needed to further explore these associations and continue to unpack the links between structural and behavioral features of the friendship network on youth's aggression.

Despite the need for additional research, these findings make several important contributions, including highlighting the importance of considering friendships using a network approach and the possibility that many youth have multiple friends who also have relationships with one another (Goodreau et al., 2009). By examining both structural and behavioral features of youth's friendship networks, I allowed for nuance and complexity in relationships that is often not considered when assessing peers' impact on aggressive behavior (e.g., Adams et al., 2005). Practically, these results highlight that

understanding the type of friendships and friendship networks associated with greater youth aggression (i.e., youth with large friendship network, youth with low interconnected networks) is important for parents and teachers. That is, perhaps extra attention should be paid to youth with large friendship networks, or efforts should be made to encourage highly interconnected networks, given how these relationships are associated with aggression. Further, encouraging interconnection among one's friends may be a way to reduce aggression. Interventions might focus on building trust and cohesion within (as well as across) friendship networks, as these bonds seem to be useful in decreasing youth's involvement in aggression.

CHAPTER 3

STUDY 2: DYADIC PEER INTERACTIONS: THE IMPACT OF AGGRESSION ON RELATIONSHIP FORMATION WITH NEW PEERS

Friendships form when youth engage in repeated positive interactions with one another (Hartup, 1996; Hinde & Stevenson-Hinde, 1987; Hinde, 1976). Friendships are important for youth; they provide support, bolster self-esteem, and are a primary context for socialization opportunities (Berndt, 1979; Crockett et al., 1984; Hartup, 1996). They also have a strong and sustained impact on youth's behavior and adjustment (e.g., Espelage & Holt, 2001; Hartup, 1996). However, they may carry unique meaning for aggressive youth because friends are also important influences on aggressive youth's own engagement in aggression and their likelihood of increasing (or decreasing) their aggression over time (Card & Hodges, 2006; Espelage & Holt, 2001; Haselager, Hartup, van Lieshout, & Riksen-Walvaren, 1998). The extant literature speaks to the impact of friends on youth aggression *once the friendship has formed*. However, very little is known about how aggressive youth initially form relationships with peers. Relationships are impacted by all past interactions among individuals in the relationship; therefore, initial interactions set the stage for future interactions and thus, relationships (Hinde & Stevenson-Hinde, 1987). As such, understanding how aggressive youth initially interact with – and form relationships with – peers can be used to encourage the formation of high-quality, non-aggressive friendships.

Studying how aggressive youth initially form relationships requires introducing unfamiliar peers, who vary on level of aggression, to one another. This can be quite difficult to achieve in the school contexts in which developmental researchers frequently

work, because youth in schools often have prior relationships with one another. Even at the beginning of a new school year, youth may have reputational knowledge of their peers, which itself impacts the way they interact with and form relationships with one another (Hartup, 1996). As such, studying the initial formation of relationships requires bringing previously unfamiliar peers together in a neutral environment and observing how their initial interactions unfold.

In one of the few extant studies to consider how aggressive youth form new relationships with peers, Dodge (1983) demonstrated that aggressive children interacted with new peers in hostile and non-cooperative ways that elicited negative reactions from peers and resulted in a decreased likelihood of forming new peer relationships (although this study only included boys). In the present study, I will build on this work by studying a sample of fifth graders interacting with an unfamiliar partner in a structured laboratory task. I will examine how youth's *tendencies* towards aggression impact the level of collaboration during the structured task with a new peer. That is, does having a propensity towards aggression impact one's patterns of interactions with an unfamiliar peer? Further, I will examine the aggressive tendencies of *each member* of the interaction in tandem. This is important because an interaction is a joint process, such that the characteristics of all those involved are likely important (e.g., Hinde & Stevenson-Hinde, 1987). For aggressive youth, for example, it may be that relationship formation is driven not simply by one's own unique level of aggression (regardless of who one is interacting with), but by the tendency of both the child and the interaction partner to be aggressive (i.e., the similarity or difference in aggression). Therefore, considering the dyadic nature of peers' aggressive tendencies on relationship formation will further extend extant work

and provide additional clarity on the process through which aggressive youth form (or fail to form) initial relationships with peers.

Aggressive Youth's Peer Relationships

Aggressive youth's peer relationships are important because they have the potential to either elevate or mitigate aggression. For instance, friendships, particularly friendships with non-aggressive peers, are quite desirable for aggressors because they may result in a decrease in aggressive behavior (e.g., Henry et al., 2000). However, there is reason to believe that aggressive youth have peer relationship difficulties. First, some aggressors are rejected and friendless (Ladd & Burgess, 1999), suggesting that aggressors may have difficulty forming relationships with peers. Second, although some aggressors *do* have friends, these friends may be aggressive themselves (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Card & Hodges, 2006; Espelage, Holt, & Henkel, 2003; Haselager et al., 1998). Such friendships can also be viewed as relationship difficulties, given that friendships with aggressive youth may increase one's own aggression (Espelage & Holt, 2001; Mouttapa, Valente, Gallaher, Rohrbach, & Unger, 2004), and thus are likely not healthy and positive relationships for aggressive youth. As such, aggressive youth's peer relationships are concerning, given that aggressive youth may have difficulty forming initial relationships, and when they are able to form relationships, these are relationships are likely to be with other aggressive peers.

Mechanisms through which aggression affects relationships. It may be that aggressive youth's *behavior* in initial interactions impacts the potential for relationships to form. That is, it may be that aggressive youth behave in certain ways in initial interactions with peers that sets the stage either for friendships to form (perhaps with

other aggressive peers), or that inhibit the formation of friendships. These initial interactions are important, because all subsequent interactions depend on the feelings and impressions formed during initial interactions (Hinde & Stevenson-Hinde, 1987). However, with a few notable exceptions (e.g., DiLalla & John, 2014; Dodge, 1983), little is known about the specifics of aggressors' initial interactions with peers. That is, the pathways that underlie the development of aggressors' relationships have been understudied. In Dodge's (1983) study, groups of eight young boys (7- to 8-years-old) were brought into a lab and observed playing together. Dodge found that boys who displayed aggressive behaviors were rejected by their peers, and speculated that this may be because aggressive boys were more hostile, assertive, and did not collaborate well in play. That is, displaying hostility, assertiveness, or even aggression itself in interactions likely results in increased rejection and dislike from the interaction partner. In fact, in another lab-based study of young children, DiLalla and John (2014) found that, for 5-year-old children observed in dyadic play with an unfamiliar peer, children who were more aggressive during the interaction also received more aggression from their partner (i.e., were victimized). Therefore, in initial interactions with peers, aggressive children may elicit negative reactions from their peers.

However, both of these laboratory studies involved relatively young children (5- to 8-year-olds), who may have been more likely to display overt hostility or acts of aggression than would older children (Cairns, Cairns, Neckerman, Ferguson, & Garipey, 1989; Loeber, 1982). Among older children, aggressive behavior may not be so overtly displayed, particularly in initial, adult-structured interactions (as can occur in daily life as children meet new peers in school contexts, after school activities, or other structured

settings). Rather, it may be that those with different propensities towards aggression engage in differing *interactional styles*, and these interactional styles impact the potential for a relationship to form. For instance, among younger children (4- to 6-year-olds), negative associations have been found between aggression and cooperation (Stenseng, Belsky, Skalicka, & Wichstrøm, 2014), and positive associations have been found between aggression and giving commands to peers (DiLalla & John, 2014; Hanish, Sallquist, DiDonato, Fabes, & Martin, 2012). For third to fifth graders, those high in aggression had low *cooperative dispositions* (i.e., having a preference towards engaging in cooperative behaviors; Choi, Johnson, & Johnson, 2011). However, in that same study, aggression was unrelated to the frequency with which individuals engaged in cooperative activities. Similarly, in a sample of seventh to ninth graders in China, no association was found between aggression and cooperation skills (Wang, Chen, Xiao, Ma, & Zhang, 2012). Despite these few contradictory findings, empirical and theoretical research suggest that youth's level of aggression may impact the level of collaboration with an unfamiliar peer.

Further, collaboration likely affects how the youth is perceived by his or her interaction partner, as well as how the youth perceives his or her interaction partner; dyads who exhibit higher levels of collaboration likely have more positive perceptions of one another than dyads who engage in lower levels of collaboration. This is supported by studies finding that cooperation can lead to increased liking (Blaney, Stephan, Rosenfield, Aronson, & Sikes, 1977; Gottheil, 1955). Further, researchers report more collaboration among friends than non-friends (e.g., Hartup, 1996), suggesting that dyads who collaborate more may be more likely to form friendships than dyads who collaborate

less. The first goal of the current study is to test these hypotheses and determine whether one's collaborative interaction patterns provide the link between one's behavioral tendencies and the potential to form positive relationships.

Dyadic perspective. Importantly, interactions inherently involve the presence and influence of more than one individual (Hinde & Stevenson-Hinde, 1987). Therefore, when considering the process of relationship formation between two individuals, it is important to consider the characteristics of both of those involved in the interaction. Adopting a dyadic perspective like this encourages the simultaneous examination of each member's level of aggression (i.e., the dyadic nature of aggression). That is, are both individuals in an interaction aggressive, or is one highly aggressive and the other not so? This is important because the process of relationship formation may be driven by the behavioral characteristics (i.e., aggression) of all those involved. For instance, although above it was suggested that aggressive youth may not collaborate well in interactions with unfamiliar peers, this may *not* be the case when both individuals are aggressive. Rather, it may be that two highly aggressive individuals would collaborate well together. In fact, researchers have discussed a phenomenon known as deviancy training, wherein highly delinquent and aggressive individuals engage in deviant talk (Dishion, McCord, & Poulin, 1999; Dishion et al., 1996). Deviant talk – although not what we would consider productive or positive – may indicate a level of *collaboration* among aggressive youth, in terms of their mutual discussion of deviant acts, and can, in fact, be used to establish bonds and friendships. Thus, it may be that in a dyadic interaction with two relatively aggressive individuals, the dyad develops its own positive norms of aggression, thus increasing collaboration between the dyad and increasing overall aggression. Therefore,

two highly aggressive individuals may get along and collaborate well together, given their similar interaction style.

Conversely, a large discrepancy between peers' level of aggression may be especially problematic. That is, when one dyad member is much more aggressive than the other, this may be a *particularly* difficult interaction to manage. Youth who differ based on their propensity towards aggression may have different interactional styles. This disconnect may make interactions difficult to manage and may make friendship formation unlikely. This issue has not, to my knowledge, been examined with regard to interactions between aggressive and non-aggressive youth. However, other research has shown that interactions among peers who differ on characteristics that impact their interactional styles, such as gender, can be challenging. To illustrate, girls and boys generally learn interaction patterns associated with their own gender but not the other, because of the elevated time spent with members of their own gender group relative to members of the other gender group (La Freniere, Strayer, & Gauthier, 1984; Maccoby & Jacklin, 1987; Martin, Fabes, Evans, & Wyman, 1999; Mehta & Strough, 2009). For instance, boys tend to engage in more active and rough play in larger social groups, and girls tend to spend time in smaller groups, preferring indoor to outdoor activities (e.g., Belle, 1989; Benenson & Christakos, 2003). As such, when girls and boys come together, these interactions can sometimes be difficult because of girls' and boys' different preferred interaction styles (Maccoby, 1990, 1998). Gendered styles of interaction are clearly different from aggressive and non-aggressive interaction styles, yet parallel processes might occur. As such, I expect less collaboration between peers who differ in

their level of aggression, which might, in turn, negatively impact positive peer perceptions.

Taking a dyadic approach will allow for a better understanding of the process through which aggressive tendencies can impact the initial formation of a relationship (or lack thereof). The second goal of the study speaks to this; I will assess whether dyadic discrepancy between youth's aggression (i.e., the *difference* between each peer's propensity for aggression) impacts the perceptions that youth have of one another, and assess whether this is mediated by the extent to which the interaction is collaborative. As such, this study will help clarify the mechanisms through which aggressive tendencies can impact peer relationships. Thus, this can increase our knowledge of how aggressive individuals form relationships with peers.

The Current Study

The overarching goal of this study was to address how youth with aggressive tendencies interact with and form initial relationships with their peers. I observed the interactions of unfamiliar pairs of fifth grade youth engaging in a structured, non-aggressive task. This structured task parallels what might be frequently encountered in a structured school environment, with the added advantage that these peers were completely unfamiliar; thus, results are not confounded by past experiences or interactions peers may have had with one another. In fact, given that youth spend much of their time in classroom settings, the classroom is a common environment within which friendships form. As such, the similarity of this laboratory task to a structured school environment offers some ecological validity in examining the process through which aggressive youth form (or fail to form) positive peer relationships.

Given the structured nature of the task and the lack of familiarity between the two peers, I expected to see little (if any) aggressive behavior *enacted* during the task. Despite this, my goal was to examine how tendencies towards aggression (i.e., youth's propensity for aggression, even though no aggression was displayed) impacted one's interactional style (i.e., the level of collaboration with a peer), and to see how the interactional style impacted each peer's perceptions of one another (and potential for forming a future relationship). Although this first goal concerns how each individual's unique level of aggression impacts collaboration and peer perceptions, models tested were not truly *individual*, given that I assessed interactions between two dyad members. Thus, I use the term the Unique Aggression Hypothesis, wherein I expect that individuals with greater tendencies towards aggression would engage in less collaboration with their interaction partner, which would, in turn, negatively affect how the peer perceived the partner, as well as how the partner perceived the peer. The second goal was to examine this process using a truly dyadic perspective. That is, my goal was to determine whether the discrepancy of each dyad member's aggression (considering the difference between each peer's tendency towards aggression) affected collaboration in the dyad, which in turn affected positive peer perceptions. For this Dyadic Discrepancy in Aggression Hypothesis, it was expected that dyads more disparate in their aggression (e.g., one peer was highly aggressive, one peer was non-aggressive) would have less collaboration in the interaction, which would be associated with both partners reporting less positive peer perceptions. However, those with similar levels of aggression (e.g., both were highly aggressive or both were low in aggression) might have high levels of collaboration, which would be associated with more positive peer perceptions. Addressing these goals

provided insight into the potential processes through which aggressive youth form (or fail to form) peer relationships during initial interactions with a previously unfamiliar peer.

Method

Participants

As part of a large, laboratory-based observational study of young adolescents' peer interactions during school-related tasks, participants were recruited from 47 fifth grade classrooms within 16 public and charter elementary schools (with between 10 and 35 students per classroom) from an urban southwestern city in the United States. The project coordinator recruited participants in their schools, where she briefly described the study and provided students with parental permission forms. Interested families were then contacted for participation. Three hundred and thirty-nine participants gave consent to participate; teacher data were collected for these participants. Of these 339 participants, 245 participated in the laboratory study (those who did not participate did not do so for a variety of reasons, such as conflict with schedule, never returned a phone call or email, or did not have working phone numbers).

Participants were 10 to 13 years old (M age = 11.13 years; SD = .42; 50% female). The majority of children were White, Caucasian, or European American (67%), and the remaining children were Latino or Hispanic (9%), Asian (5%), Black or African American (3%), Native American (1%), Pacific Islander (1%), or other (14%). The majority of children were from families who earned more than \$60,000 per year (69%), and 10% earned less than \$30,000 per year. Over half of the children (69%) came from two-parent, married families, and the remaining children were from single parent, non-

married families (26%), single parent, married families (4%), and two-parent, non-married families (1%).

The laboratory observation session involved pairing participants into dyads with partners that were previously unknown. Participants were paired together randomly, ensuring that dyad members did not know each other, and ensuring an equal number of boy-boy, girl-girl, and mixed-gender dyads. Of the 245 students that participated in the laboratory study, 216 participated in dyadic interactions with unfamiliar partners (i.e., 108 dyads), and thus were included in the analytic sample. At times, one scheduled member of the dyad would arrive and the other would not. In these instances, the dyad member who arrived for the scheduled laboratory session would participate with an adult. The 29 students who participated with an adult were compared to those who participated with same-age peers on key study variables; no significant differences were found. However, these 29 students were not included in analyses.

Procedure

Teachers completed pencil-and-paper questionnaire packets for each participating student. Included in this questionnaire package was a measure of students' aggression. The entire questionnaire took approximately 15 minutes to complete. Teachers received monetary compensation for their participation.

Youth participated in a laboratory observation session, wherein they were randomly paired with an unfamiliar partner, and were asked to engage in a physical science task. The task was completed in a laboratory room, furnished with a table and two chairs placed on either side of the table. The participants were brought into the room and instructed to sit at the chairs, facing each other. A headset-microphone was placed on

each child to record his or her auditory responses, and a video camera was placed in the room perpendicular to the orientation of the children (audio and video recordings were not used for the current study).

The science task consisted of 10 trials, designed to create a repetitive problem-solving situation that allowed the dyad to settle into an interaction pattern that represents the dyad's typical interaction processes (Thelen & Smith, 1998). In each trial, dyads were asked to build a molecule, using pieces from a chemistry molecular model set. Dyads were presented with a two-dimensional picture of a molecular model (e.g., hydrogen) and were asked to work together to create an identical copy of the three-dimensional model. Dyads were instructed that upon completion of a model, they were to place the model and all instructions in a box to the side of the table, and begin working on the next model. For trials not completed in 4 minutes, dyads were interrupted by the experimenter and asked to move on to the next trial (models were structured at a level of difficulty that required dyads to spend approximately 1-2 minutes completing each). The experimenter left the room during the trials, and the dyads were told that they were being observed through a one-way mirror (as well as video- and audio-recorded). Immediately following the 10 trials, the experimenter, as well as two trained observers, independently coded several behaviors and features of the dyad.

After the observational session, each dyad member was brought into a separate small room and completed a pencil-and-paper post-test questionnaire package to assess their reactions to the science task and to their partner. The entire laboratory visit took approximately 1 hour. Children received a small gift as a token of appreciation for participating.

Measures

Teacher-rated aggression and dyad member classification. Teachers responded to the Child Behavior Scale (Ladd & Profilet, 1996), which included seven items assessing children's physically aggressive behavior. Responses were assessed using a 3-point Likert scale, ranging from 1 = Doesn't Apply to 3 = Certainly Applies. Scores for the seven items were averaged together (Cronbach's $\alpha = .93$).

Teacher-rated aggression was used to calculate three indices of aggression. For each of the three indices, it was first necessary to distinguish between dyad members. Thus, within each dyad, children were classified as either a *high aggression partner* or *low aggression partner*, based on their relative level of teacher-rated aggression in comparison to their dyad partner. That is, within each dyad, the individual with the higher score on aggression was labelled as the *high aggression partner* and the individual with the lower score on aggression was labelled as the *low aggression partner*. Each of the following three indices was calculated for the high and low aggression partners.

Individual Aggression. Teacher-rated aggression (i.e., the average of the seven items) was used as the measure of each individual's aggression. Thus, both the high aggression partner and the low aggression partner had a score on Individual Aggression. This was used as a predictor in analyses testing the hypothesis that each individual's aggression would impact collaboration within a dyadic task and dyad partners' perceptions of one another.

Absolute Aggression. A measure of *Absolute Aggression* was created for each individual (i.e., a separate Absolute Aggression score for the high aggression partner and the low aggression partner), which was used as a covariate. As noted previously, it was

necessary to differentiate between dyad members, based on aggression scores relative to the particular peers in each dyad. However, the high aggression partner may or may not have had elevated scores on Individual Aggression, for example. Indeed, the high aggression partner in one dyad may actually have been quite low on Individual Aggression (i.e., if both dyad members were relatively low on aggression) and the low aggression partner in another dyad might have been high on Individual Aggression (i.e., if both dyad members were relatively high on aggression). For this reason, I calculated Absolute Aggression as follows. Individuals received a score of 1 on Absolute Aggression if their score on Individual Aggression was greater than half a standard deviation above the sample mean (i.e., 1.58; chosen based on previous studies using similar cut-off points; Burk et al., 2008; Haynie et al., 2001; Schwartz, 2000). Note that a 2 on the Child Behavior Scale refers to “somewhat applies.” Thus, because teacher-rated aggression in the sample was quite low, even those high in Absolute Aggression (i.e., had scores greater than 1.58) may have been rated by their teachers as only “somewhat” aggressive. Individuals with scores less than half a standard deviation above the mean received a 0. This indicator variable was used as a control to account for whether or not dyad members were high on Absolute Aggression when assessing how aggression (at both the individual and dyadic level) impacted collaboration and perceptions of one’s partner (as well as the partner’s perceptions of the individual). That is to say, this measure was used to control for the degree to which high and low aggression partners were, indeed, high or low in aggression.

Dyadic Discrepancy in Aggression. For analyses testing the hypothesis that the *dyadic discrepancy* in aggression of the dyad would impact collaboration and partners’

perceptions of one another, a Dyadic Discrepancy in Aggression score was computed. For each dyad, the low aggression partner's Individual Aggression score was subtracted from the high aggression partner's Individual Aggression score. Thus, the Dyadic Discrepancy score was always positive. A high Dyadic Discrepancy score indicates a large discrepancy in aggression between dyad partners; the high aggression partner was much higher in Individual Aggression than the low aggression partner. A low Dyadic Discrepancy score indicates that the dyad members are fairly similar in aggression, either both being relatively high or both being relatively low in Individual Aggression.

Collaboration. Following the dyadic interaction, trained observers independently coded several behaviors and features of the dyad (in vivo), including a measure of dyadic Collaboration (adapted from Bayley, 1969). Collaboration was operationalized as “the degree to which the dyad is supportive of each other and works together to build molecules”. This was rated on a 5-point Likert scale ranging from 1 = Not Collaborative to 5 = Collaborative on Most Trials. Three observers independently rated each dyad (Cronbach's $\alpha = .73$), and scores for the three observers were averaged to create a total Collaboration score for each dyad.

Peer Perceptions. After the laboratory task, youth completed a questionnaire package, including an 8-item measure assessing youth's perceptions of their partner during the task (adapted from Underwood, Schockner, & Hurley, 2001). Responses were assessed on a 7-point Likert scale ranging from 1 = Not at All to 7 = A Lot (e.g., “Would you like to work with the same kid on similar tasks”). Scores on all eight items were averaged to create total Peer Perception scores ($\alpha = .84$).

Dyad gender composition. Dyads were specifically scheduled to ensure an approximately equal number of girl-girl ($n = 35$ dyads), boy-boy ($n = 37$ dyads), and mixed-gender dyads ($n = 36$ dyads). Dyad gender composition (dummy-coded with mixed-gender as the reference group) was included as a covariate.

Results

The goal of this study was to examine whether collaboration within a dyad mediated the association between aggression and peers' perceptions of one another (and thus, the possibility for a relationship to form). This goal was achieved by testing two hypotheses: The Unique Aggression Hypothesis and the Dyadic Discrepancy in Aggression Hypothesis. For the Unique Aggression Hypothesis, I expected that each individual's tendency towards aggression would negatively impact collaboration, which would then negatively impact peers' perceptions of one another. For the Dyadic Discrepancy in Aggression Hypothesis, I explored whether greater disparity in aggression between the two dyad partners would negatively impact collaboration and peer perceptions, relative to greater similarity. Dyadic mediation analyses, first assessing Individual Aggression, then assessing Dyadic Discrepancy in Aggression, were used to address these goals.

Descriptive Analyses

Of those categorized as the high aggression partner (i.e., had a higher Individual Aggression score than their dyad partner), nearly half (46%) were high in Absolute Aggression (meaning that their Individual Aggression score was greater than half a standard deviation above the mean; 1.58). Of those categorized as the low aggression partner, only 7% had high Absolute Aggression. Considering this at the dyad level, in

54% of dyads, both dyad members were *not* high in Absolute Aggression. For 39% of the dyads, only the high aggression partner was high in Absolute Aggression, and in 7% of the dyads, both the high and low aggression partners were high in Absolute Aggression.

Both individual and dyadic level variables were assessed for normality; Collaboration was reflected square root transformed (due to negative skew) to better approximate normality. Table 4 (Panel 1) shows means and standard deviations for study variables. As expected, high aggression partners had significantly higher Individual Aggression than low aggression partners, $F(1, 71) = 95.85, p < .001, \eta^2 = .57$. There was no difference between the high aggression partner and the low aggression partner in their Peer Perceptions, $F(1, 71) = .48, p > .05, \eta^2 = .01$.

Zero-order correlations were computed among study variables (see Table 4, Panel 2). The high aggression partner's Individual Aggression score and the Dyadic Discrepancy in Aggression score were negatively correlated with Collaboration. The high aggression partner's Individual Aggression score was also negatively correlated with Peer Perceptions (i.e., how the high aggression peer perceived his or her partner), and the Dyadic Discrepancy score was negatively correlated with the low aggression partner's Peer Perceptions. Collaboration and Peer Perceptions (for both the high and low aggression partner) were positively correlated to one another.

Mediation Analyses

To address the main goals of this study, a series of four dyadic mediation models were run using *Mplus 7* (Muthén & Muthén, 2012). In all models, missing data was handled using full information maximum likelihood (Arbuckle, 1996). Gender composition of the dyad was included as a covariate of Collaboration in all models. That

is, given that youth tend to form relationships with same-gender peers more readily than relationships with other-gender peers (e.g., Maccoby, 1990), it was expected that same-gender dyads would engage in higher levels of collaboration than mixed-gender dyads. Thus, a set of dummy coded variables were included to control for the effect of the gender composition of the dyad on Collaboration. That is, Boy-Boy Dyad Gender Composition was coded as boy-boy dyads = 1; Girl-Girl Dyad Gender Composition was coded as girl-girl dyads = 1. Thus, the reference group for Dyad Gender Composition was mixed-gender dyads. As suggested by Tofghi and MacKinnon (2011), confidence limits for indirect mediation effects were examined using both bias corrected bootstrapping in *Mplus* and using the distribution of the product of coefficients method in *RMediation*. A convergence of findings across both methods will increase confidence in the results.

Unique Aggression Hypothesis: Model specification. In the first model, paths were specified from each dyad member's Individual Aggression (the continuous measure of teacher-rated aggression) to Collaboration (a_H and a_L paths; "H" indicating high aggression partner, "L" indicating low aggression partner), from Collaboration to each dyad member's Peer Perceptions (b_H and b_L paths), and from each dyad member's Individual Aggression to each member's Peer Perceptions (c'_{HH} , c'_{HL} , c'_{LH} , and c'_{LL} paths). Indirect paths from Individual Aggression, through Collaboration, to Peer Perceptions were also assessed. In the second model, the same paths were specified. In addition, this model controlled for Absolute Aggression (given that, for instance, the high aggression partner within the dyad may have a relatively low score on Individual Aggression within the overall sample). Thus, paths were specified from the high aggression partner's Absolute Aggression (a dummy coded variable with 1 representing

high Absolute Aggression) to the high aggression partner's Individual Aggression, and from the low aggression partner's Absolute Aggression to the low aggression partner's Individual Aggression (see Figure 1). This model allowed me to assess how each dyad member's Individual Aggression impacted Collaboration and Peer Perceptions, controlling for each dyad member's level of Absolute Aggression.

Unique Aggression Hypothesis: Model evaluation. The first model, which assessed Individual Aggression of both the high and low aggression partner, fit adequately, as indicated by $\chi^2(4) = 7.49, p > .05$, CFI = .92, SRMR = .05, and RMSEA = .09 (90% Confidence Interval [CI] = .00 to .19). Both *a* paths were not significant ($a_H = -.08, p > .05$; $a_L = -.03, p > .05$), indicating that Individual Aggression did not predict dyadic Collaboration. Both *b* paths were significant ($b_H = 1.25, p < .01$; $b_L = 1.30, p < .01$), indicating that higher Collaboration within the dyad was associated with more positive Peer Perceptions for both the high aggression partner and low aggression partner (i.e., the high aggression partner felt positively about and desired a continued relationship with the low aggression partner, and vice versa). None of the *c*' paths were significant ($c_{HH} = -.31, c_{HL} = -.36, c_{LH} = -.08, c_{LL} = .85, p_s > .05$), indicating no direct association between Individual Aggression and Peer Perceptions. Further, indirect effects were not significant, and 95% confidence limits included 0, indicating no significant mediation (indirect effect_{HH} = -.10, 95% CI = -.24 to .05; indirect effect_{HL} = -.10, 95% CI = -.25 to .05; indirect effect_{LH} = -.03, 95% CI = -.32 to .25; indirect effect_{LL} = -.03, 95% CI = -.33 to .26). Asymmetric confidence limits (assessed using RMediation; Tofiqi & MacKinnon, 2011) also indicated no significant mediation (i.e., intervals included 0; HH

95% CI = -.16 to .13; HL 95% CI = -.16 to .13; LH 95% CI = -.36 to .28; LL 95% CI = -.36 to .28).

The second model, which controlled for Absolute Aggression of each dyad member, fit adequately, as indicated by $\chi^2(17) = 38.40, p < .01$, CFI = .91, SRMR = .08, and RMSEA = .11 (90% CI = .06 to .15). Each dyad member's Absolute Aggression was significantly associated with their Individual Aggression (high aggression peer $b = .80, p < .001$; low aggression peer $b = .75, p < .001$). Controlling for each dyad member's Absolute Aggression, parameter estimates similarly indicated that Individual Aggression did not predict Collaboration or Peer Perceptions, but Collaboration positively predicted Peer Perceptions (see Figure 1). As with the first model, indirect effects and confidence limits indicated no significant mediation (indirect effect_{HH} = -.10, 95% CI = -.24 to .05; indirect effect_{HL} = -.10, 95% CI = -.25 to .04; indirect effect_{LH} = -.03, 95% CI = -.30 to .24; indirect effect_{LL} = -.03, 95% CI = -.31 to .25). Asymmetric confidence limits also indicated no significant mediation (HH 95% CI = -.27 to .03; HL 95% CI = -.27 to .03; LH 95% CI = -.34 to .26; LL 95% CI = -.34 to .27). As such, even controlling for each dyad member's Absolute Aggression, Individual Aggression of each dyad member was unrelated to Collaboration and unrelated to Peers' Perceptions of one another.

Dyadic Discrepancy in Aggression Hypothesis: Model specification. In order to test whether the *discrepancy* in aggression between each member of the dyad impacted collaboration and peer perceptions, two additional models were run using Dyadic Discrepancy in Aggression instead of Individual Aggression. In the third model, paths were specified from Dyadic Discrepancy in Aggression to Collaboration (a path), from Collaboration to each dyad member's perceptions of one another (Peer Perceptions; b_H

and b_L paths), and from Dyadic Discrepancy in Aggression to each member's Peer Perceptions (c'_H and c'_L paths). Indirect paths from Dyadic Discrepancy in Aggression, through Collaboration, to Peer Perceptions were also assessed. In the final model, paths from each dyad member's Absolute Aggression to Dyadic Discrepancy in Aggression were included (see Figure 2). This allowed me to control for whether or not individuals within each dyad were high in aggression relative to the whole sample, and assess the impact of the disparity in aggression between dyad members on collaboration and peer perceptions.

Dyadic Discrepancy in Aggression Hypothesis: Model evaluation. The third model, using Dyadic Discrepancy in Aggression (i.e., the disparity in aggression between the high aggression partner's and low aggression partner's Individual Aggression) instead of Individual Aggression, fit adequately, as indicated by $\chi^2(4) = 7.13, p > .05$, CFI = .94, SRMR = .05, and RMSEA = .09 (90% CI = .00 to .19). The a path was significant ($a = -.15, p < .01$), indicating that dyads with higher Dyadic Discrepancy in Aggression (i.e., a greater difference in Individual Aggression between the high aggression partner and low aggression partner) were less collaborative. Both b paths were also significant ($b_H = 1.29, p < .01$; $b_L = 1.24, p < .01$), indicating that, as before, higher Collaboration was associated with more positive Peer Perceptions for both the high aggression partner and low aggression partner. The c' paths were not significant ($c_H = -.32$ and $c_L = -.35, p > .05$), indicating no direct association between Dyadic Discrepancy in Aggression and Peer Perceptions. However, indirect effects indicated significant mediation, and 95% confidence limits did not include 0, showing evidence of significant mediation (indirect effect $_H = -.20, p < .05, 95\% \text{ CI} = -.38 \text{ to } -.02$; indirect effect $_L = -.19, p < .05, 95\% \text{ CI} = -$

.35 to -.03). Asymmetric confidence limits (assessed using RMediation) also indicated significant mediation (i.e., intervals did not include 0) for the pathway to both the high aggression partner's Peer Perceptions (95% CI = -.20 to -.10) and low aggression partner's Peer Perceptions (95% CI = -.38 to -.05).

The final model, which controlled for each dyad member's Absolute Aggression, also fit adequately; $\chi^2(12) = 16.42, p > .05$, CFI = .96, SRMR = .06, and RMSEA = .06 (90% CI = .00 to .12). The high aggression partner's Absolute Aggression was positively associated with Dyadic Discrepancy in Aggression ($b = .65, p < .001$) and the low aggression partner's Absolute Aggression was negatively associated with Dyadic Discrepancy in Aggression ($b = -.27, p < .05$). Controlling for each dyad member's Absolute Aggression, the fourth model indicated similar findings as the third; Dyadic Discrepancy in Aggression was negatively associated with Collaboration, and Collaboration positively predicted Peer Perceptions (see Figure 2). Both indirect effects and confidence limits indicated significant mediation from Dyadic Discrepancy in Aggression through Collaboration to both partners' perceptions of one another (indirect effect_H = -.20, $p < .05$, 95% CI = -.38 to -.02; indirect effect_L = -.19, $p < .05$, 95% CI = -.35 to -.03). Similarly, asymmetric confidence limits indicated significant mediation for the pathway to both the high aggression partner's Peer Perceptions (95% CI = -.41 to -.04) and low aggression partner's Peer Perceptions (95% CI = -.38 to -.05). Thus, even controlling for each dyad member's Absolute Aggression, a higher Dyadic Discrepancy in Aggression (i.e., a larger difference in Individual Aggression between high and low aggression partner) was associated with less Collaboration, which was associated with each peer having less positive perceptions of one another.

Discussion

The goal of this study was to examine how aggression impacted collaboration within a dyad, and to examine how collaboration impacted partners' perceptions of one another (i.e., the potential for a relationship to form). I did not find evidence that either dyad partner's unique aggression impacted collaboration or partner perceptions, but the dyadic discrepancy in aggression was related to collaboration within the interaction. Specifically, dyads more disparate in their aggression had lower collaboration, and this was associated with less positive perceptions of one another. The importance of considering a dyadic perspective, as well as the practical implications of these findings are discussed below.

Individual Level

Contrary to hypotheses, I did not find support for the Unique Aggression Hypothesis. That is, neither partner's tendency toward aggression impacted the level of collaboration within the dyad. This stands in contrast to some prior research that has suggested aggression may be associated with negative reactions from peers, including peer rejection and retaliatory victimization (DiLalla & John, 2014; Ladd & Burgess, 1999). This lack of findings may be explained by considering the nature of the interaction being observed. That is, unfamiliar youth were observed in a formal, laboratory setting, knowing that they were being videotaped and monitored by researchers. Thus, I did not expect to see aggression enacted during the task; rather, I was simply assessing youth's tendencies toward aggression, as indicated by their teachers. In prior studies assessing peers' perceptions of previously unknown (young) children, researchers reported that aggressive behavior itself elicited negative reactions from peers (DiLalla & John, 2014;

Dodge, 1983). Thus, it would be interesting to see how actual instances of aggression among older youth, enacted *during* the interaction, would impact peers' perceptions of one another.

It is also important to note that I assessed previously unfamiliar pairs of youth. As such, results may point to the idea that reputational beliefs about peers are largely driving peers' relationships with one another. Past research has shown that children and youth's reputations (specifically as aggressors or victims) impact how peers react and respond to them, as well as the potential for peers to form friendships with these youth (Boulton, 2013; Dodge, 1980; Sierksma, Thijs, & Verkuyten, 2014). Thus, it may be that one's reputation as an aggressor has more to do with the potential to form a relationship with a peer than does one's tendency toward the behavior itself (although dyads' discrepancy in aggression *was* impactful, as will be discussed below). This also highlights how studying previously unfamiliar peers is both difficult to do within school settings, and is a strength of the current study. That is, the current study allowed me to examine the mechanisms through which aggressive behavior (or tendencies toward such behavior) impacts youth's relationships in the absence of any prior reputational knowledge. This allows for a purer view of how aggressive youth may form (or fail to form) peer relationships than can be gleaned from studies involving peers who already know one another. In this case, it appears that unique levels of aggression may not be particularly impactful on relationship formation, in the absence of prior knowledge of one's dyadic partner and/or active displays of aggression.

It may also be that there are behaviors – other than aggression – displayed during an initial interaction that might impact the potential for a relationship to form; behaviors

that, even at an individual level, are indicative of both aggression and a lack of collaboration with a dyadic partner. For instance, when considering that aggression may be used as a way to maintain control and dominance over others (e.g., Hawley, 2003; Pellegrini, 2001), perhaps researchers could measure control strategies or dominance in an interaction. For instance, Hawley discussed how a combination of prosocial and coercive control strategies can be used to gain dominance and control over one's peers, and youth who use these types of control strategies are both highly aggressive, as well as well-liked and socially skilled (Hawley & Vaughn, 2003; Hawley, 2003). Thus, it may be that subtler forms of control (compared to overt displays of aggression) might impact peers' perceptions of one another. That is, it is possible that youth who use coercive control strategies within an interaction (even at the individual, or *unique* level) may have less collaboration with their dyadic partner, whereas those who display prosocial control strategies or a combination of prosocial and coercive control strategies maintain high levels of collaboration and positivity within the interaction. It is possible that by examining these subtle behaviors, there might be support for my *unique* behavior hypotheses.

Dyadic Level

Support was found for the Dyadic Discrepancy in Aggression Hypothesis; dyads who were more different in their tendencies toward aggression were less collaborative, and had less positive perceptions of one another. In contrast, those more similar in aggression were more collaborative within the interaction, and had more positive perceptions of one another. Research has shown that highly deviant youth often get along well with one another, and may use their shared deviance as a way to form a friendship

(Dishion et al., 1999, 1996). The current results support these notions; it appears that youth who are similar in their tendencies toward aggression may share an interactional style, and this shared interactional style is associated with more positive perceptions of one another. Findings also supported hypotheses that those who do *not* share an interactional style (i.e., a large discrepancy in aggression) would not collaborate well together. These hypotheses were based, in part, on gender research, that has explored how boys' and girls' differing interactional style may cause segregation in terms of gendered play (Maccoby & Jacklin, 1987; Martin et al., 1999). The current parallel findings suggest that these ideas might be applicable across behavioral domains. That is, findings show that (dyadic) behavioral tendencies (i.e., aggression) impact youth's interactions, which can in turn impact the potential for a relationship to form. Thus, it may be useful to examine other behaviors at the dyadic level, and consider how discrepancy in terms of behavior can impact youth's interactional style and potential for a relationship to form.

Findings offer an explanation as to why youth with a discrepancy in terms of aggression may not form a relationship with one another; it seems that those with a large discrepancy in their tendencies toward aggression may not collaborate well with one another, and this lack of collaboration appears to contribute to the lack of relationship formation. That is, I found that collaboration is a mechanism through which a discrepancy in aggression can lead to the formation of a relationship (or lack thereof). This can be used to inform intervention work, by highlighting collaboration as a point of possible intervention. For instance, given that collaboration can lead youth to feel more positively about each other, even among previously unfamiliar youth, teachers and

interventionists may be able to use this information to encourage collaboration and collaborative activities between prosocial and antisocial youth, in order to foster positive relationships (see Miller et al., under review).

Limitations and Future Directions

The measure of aggression used in the current study only contained items of physical aggression (e.g., fights with peers; kicks, bites, or hits peers). It is possible that the finding regarding the discrepancy in aggression might have been *stronger* had I measured relational aggression. Relational aggression is more accepted by peers than physical aggression, particularly in early adolescence (Cillessen & Mayeux, 2004). Thus, it is possible that youth may use relational aggression to enhance and improve their relationships in ways that they cannot do with physical aggression. For instance, an individual who gossips with another (about a third) may effectively strengthen the relationship between the first two individuals, while simultaneously diminishing the status and reputation of the third. In this way, it may be that those with similar tendencies toward relational aggression might be particularly collaborative – provided that they use their tendencies toward relational aggression to bond with one another, rather than outwardly display relational aggression against the other. This is an interesting avenue of future research that could provide insight into how different forms of aggression may differentially impact collaboration and the potential for aggressive youth to form relationships with their peers.

As noted above, aggression itself during the task was not assessed, nor was it expected. However, this limits our ability to understand how the enactment of aggression towards an unfamiliar peer impacts the potential for a relationship to form. For instance, I

found that those with similar tendencies toward aggression felt positively about one another, but I cannot determine whether this would hold if aggression itself was enacted during the interaction. In fact, the task that participants engaged in was, by design, cooperative. Perhaps, had I observed an interaction that was more competitive by nature, I would be able to measure competitive or dominance seeking behavior itself. This might be an alternative to observing aggressive behavior within an interaction (which is problematic due to ethical considerations). For instance, would two highly competitive individuals (who engage in competitive behavior *within* the interaction) have positive perceptions of one another? Measuring competitive behaviors in a task that is not inherently collaborative might provide insight into whether the discrepancy of behavior hypothesis holds when competitive or dominant behaviors are displayed within the interaction.

Implications and Conclusions

This study highlights the importance of considering youth's interactions at the dyadic level. Though I assessed both unique and dyadic (i.e., discrepancy) levels of aggression, all analyses were dyadic in that they included behaviors and perceptions of both members of the dyad. Thus, I allowed for the possibility that characteristics and behaviors of each dyad member in an interaction could influence the other. Importantly, results showed that it was not either dyad member's unique aggression that impacted the interaction, but the similarity or difference in dyad members' behavior that was important. As such, this emphasizes the value of considering youth's interactions at the dyadic level – or group level, should the interaction involve more than two peers. Researchers could consider including information relevant to all members of an

interaction, in order to fully understand how behavioral similarities or differences can contribute to behaviors within an interaction.

Results also indicated that collaboration is an important mediating mechanism through which dyadic aggression (i.e., discrepancy) impacts the potential for a relationship to form. This has important implications, both in terms of managing the relationships of aggressive youth, as well as identifying a potential intervention point for researchers and teachers. First, results indicated that two highly aggressive youth may collaborate well together, and thus form a friendship. This is concerning, given that aggressive friends can increase youth's own levels of aggression (Espelage & Holt, 2001; Mouttapa et al., 2004). As such, when highly aggressive youth engage in interactions, perhaps increased monitoring by teachers and parents is necessary. Second, results suggested that a highly aggressive individual may not collaborate well with a non-aggressive peer, and this contributes to both peers having less positive perceptions of one another. Encourage collaborative tasks or activities among pairs of youth who are discrepant in their tendencies toward aggression might allow such youth to form positive relationships with one another, thereby decreasing the aggressive youth's subsequent use of aggression.

CHAPTER 4

STUDY 3: EXPLORING THE AGGRESSOR-VICTIM DYAD: HOW DOES THE BALANCE OF POWER BETWEEN AGGRESSOR AND VICTIM AFFECT THE STRENGTH OF THE RELATIONSHIP?

When an individual aggresses against another, a relationship forms between them. Unlike many relationships, which we tend to think of as positive, aggressor-victim relationships are harmful to both the aggressor and the victim (Card & Hodges, 2008; Card et al., 2008; Eron & Huesmann, 1984; Graham, Bellmore, & Mize, 2006). But, like any relationship, the relationship between an aggressor and his or her victim can vary in strength. For instance, an aggressor might repeatedly target the same victim across days, months, or even years, with a relatively strong aggressive relationship forming over time (e.g., Chan, 2006). Such an aggressor-victim dyad would likely come to be widely known as such by peers. In fact, pairs of individuals may form a reputation as aggressor-victim dyads even when aggression is relatively infrequent, but consists of more serious aggressive acts (Rodkin, Hanish, Wang, & Logis, 2014). In contrast, some aggressor-victim relationships are weaker and have less reputational status. Understanding what contributes to variations in the strength of aggressor-victim relationships is important due to the harmful nature of this relationship (Card & Hodges, 2008; Card et al., 2008; Eron & Huesmann, 1984; Graham et al., 2006). That is, stronger relationships likely signify antipathetic relationships, more sustained negativity, lack of forgiveness, and may lead to greater adjustment problems (Abecassis, Hartup, Haselager, Scholte, & Van Lieshout, 2002; Ladd & Burgess, 1999). Conversely, weaker relationships may be more likely to desist, thus are less concerning than stronger relationships.

Despite the importance of understanding what features contribute to a strong relationship between aggressor and victim, these questions have received little empirical attention. To understand variation in the strength of aggressor-victim relationships, it may be useful to consider the power differential (e.g., the aggressor holds more power than the victim, or the aggressor and victim have relatively equal or balanced power) in the aggressor-victim relationship. Evolutionary and dominance theories describe aggression as a strategy used against others within the peer group to gain resources and physical or social rewards (e.g., Hawley, 2003; Pellegrini & Bartini, 2000; Savin-Williams, 1979). Thus, an aggressor who is successful in gaining these rewards when targeting a particular victim is likely to continue targeting that victim. When considering the extent to which an aggressor might gain rewards and resources, the power differential between aggressor and victim comes into play both in terms of the ability for the aggressor to be successful (i.e., targeting a victim with less power than him or herself; e.g., Hodges, Boivin, Vitaro, & Bukowski, 1999), as well as the rewards gained (i.e., targeting a victim with more power, and thus more resources; Adler & Adler, 1995; Andrews, Hanish, & Santos, under review; Peets & Hodges, 2014). Thus, the power differential between aggressor and victim has the potential to contribute to the strength of the aggressor-victim relationship.

In the current study, I will examine the association between the power differential – considering the extent to which aggressor-victim dyads are characterized by an imbalance of power (such that the aggressor holds more power than his or her victim) or relative balance in power – and the strength of the aggressor-victim relationship. In this study, relationship strength was based on both reputational strength (are aggressor and victim widely known as such) and longevity (are aggressor and victim known as such

across time). Although it is expected that dyads wherein the victim holds more power than the aggressor will be rare (Olweus, 1991; Pepler, Craig, Connolly, Yuile, & McMaster, 2006), the current study will be able to empirically test this as well. Importantly, power is multidimensional (Volk, Dane, & Marini, 2014); yet, the extant literature gives little guidance as to how the various dimensions of power operate in the aggressor-victim relationship and which ones are most relevant to the strength of the relationship. Therefore, I will evaluate three power dimensions; power based on societal categorization (namely, gender and ethnicity; Pratto & Espinoza, 2001), and power based on social status or position within the peer group (i.e., how central one is within the peer group; Faris & Felmlee, 2011; Pellegrini & Bartini, 2000).

This study will address several issues of interest that have, thus far, received little attention. First, the current study conceptualizes and explores the relationship strength of the aggressor-victim dyad; a concept that is relatively understudied (for an exception, see Rodkin et al., 2014), yet crucial given the potentially harmful impact of a strong and sustained aggressor-victim relationship (Abecassis et al., 2002; Ladd & Burgess, 1999). Second, the current study adopts a dyadic perspective and examines how power dynamics operate within the aggressor-victim relationship. Finally, expanding upon the multidimensionality of power allows for an exploration of the impact of the power differential in the aggressor-victim relationship in a more complex and nuanced way than has previously been examined.

Power Dynamics in the Aggressor-Victim Relationship

According to evolutionary and dominance theories, aggression may be used within a peer group to negotiate status hierarchies, to gain valued and scarce resources

from within the social group, and to inflict costs on same-sex rivals vying for access to and attention from the other sex (Buss & Shackelford, 1997; Hawley, 2003; Pellegrini & Long, 2003; Savin-Williams, 1979). Common to each of these goals of aggression is the notion of power. That is, having power may be necessary to gain resources, increase social status or position, or inflict costs on others. In fact, aggression may be used to gain power itself (Adler & Adler, 1995; Guerra, Williams, & Sadek, 2011; Pepler et al., 2006). Holding more power than one's victim may increase the aggressor's likelihood of success (Olweus, 1991; Rodkin & Berger, 2008; Rodkin et al., 2014), and as such, motivate the aggressor to continue targeting that victim. On the other hand, defeating a victim with more social resources and power may be more beneficial to the aggressor in terms of providing him or her with more benefits (Adler & Adler, 1995; Andrews et al., under review; Peets & Hodges, 2014). Here, relative equality or balance in terms of the power between aggressor and victim may motivate the aggressor to pursue a strong and sustained relationship with the victim. As such, taking a dyadic perspective (i.e., considering the power differential between aggressor and victim) may help elucidate why certain aggressor-victim dyads are stronger than others.

Power imbalance: Aggressors may have more power than victims. The strength of the aggressor-victim relationship may be contingent on the aggressor's ability to successfully *beat* his or her chosen victim. This suggests that an aggressor must have sufficient dominance and *power* over his or her victim, to gain access to coveted resources and rewards (e.g., Hodges et al., 1999). As such, targeting a victim of low power should allow an aggressor to win (i.e., gain resources) more often, thereby increasing an aggressor's likelihood of targeting that victim repeatedly. In fact, it has

been suggested that a powerful and skilled aggressor may aggress against several victims before settling on a victim that does not resist (and thus is likely of much lower power; Olweus, 1978; Patterson, Littman, & Bricker, 1967; Perry, Perry, & Kennedy, 1992). Theories of bullying posit that *inherent* in the relationship between a bully and victim is an imbalance of power, with the bully having more power than his or her victim (Olweus, 1978, 1991; Pepler et al., 2006; Volk et al., 2014). Further, bully-victim relationships are defined by the repetition of aggressive acts over time (Olweus, 1978; Volk et al., 2014). Although it should be noted that not all aggressor- victim relationships should be classified as bully-victim relationships, ideas based on bullying research hint at a connection between a large power differential between aggressor and victim and the repetition of aggressive acts. Therefore, aggressor-victim dyads characterized by a large power imbalance (with the aggressor having more power than the victim) might have particularly strong relationships (i.e., aggressor-victim dyads that are both reputationally strong and sustained over time).

Power balance: Aggressors may not have more power than victims. Although some aggressor-victim dyads may be characterized by a power imbalance with the aggressor having more power than the victim, this may not always be the case. For instance, some aggressors have low power (measured in prior studies as social status or being well liked; Atlas & Pepler, 1998; Card et al., 2008; Estell, Cairns, Farmer, & Cairns, 2002; Lee, 2009; Parker & Asher, 1987; Peeters et al., 2010), and some victims have high power (Andrews, Hanish, Updegraff, Martin, & Santos, 2016; Faris & Felmlee, 2014; Merten, 1997; Zimmer-Gembeck, Pronk, Goodwin, Mastro, & Crick, 2013). However, it should be noted that these studies have not linked aggressors with their

specific victim(s). That is, it is unclear what the *relative* power levels are between aggressors and their victims. Yet, some research suggests that aggressor-victim dyads may be relatively balanced in their levels of power (Dyches & Mayeux, 2012; Jamal, Bonell, Harden, & Lorenc, 2015; Merten, 1997; Strayer & Strayer, 1978).

Importantly, these “balanced” aggressor-victim dyads may have stronger relationships than other dyads. For one, this may be because defeating a victim with higher levels of power (i.e., more similar to the aggressor’s own power, rather than a victim with much lower power) provides the aggressor with more rewards (e.g., the victim has more social rewards or more valued resources available; Adler & Adler, 1995; Andrews et al., under review; Peets & Hodges, 2014). Gaining more rewards may encourage the aggressor to continue targeting the same victim. Further, it may be that dyads wherein aggressors and victims are relatively balanced in power have increased opportunity to interact with one another, thus increasing the likelihood of aggression. For instance, some aggressors are friends with their victims (Mishna et al., 2008; Waasdorp et al., 2010; Wei & Jonson-Reid, 2011), and thus are likely relatively equal in power. In such cases, this friendship relationship may increase contact between the pair, thus increasing the number of chances the aggressor has to target the victim. Similarly, some aggressor-victim dyads aggress against one another; an aggressor targets a victim, and the victim then retaliates with his or her own aggression (Dodge, Bates, & Pettit, 1990; Hall & Cairns, 1984; Perry et al., 1992). Such patterns of reciprocated aggression are much more likely when both aggressor and victim are similar in power, in that both would have the ability to target the other. Further, these mutually aggressive acts are likely to increase in intensity across time (Murray-Close & Crick, 2006; Rodkin, Pearl, Farmer, & Van

Acker, 2003). Therefore, it may be that aggressor-victim dyads with relatively balanced levels of power have stronger relationships than dyads with a large power differential.

Together, these accounts suggest that not only is there variability in terms of the power dynamic between aggressor and victim, but that this variability may be consequential in determining which aggressor-victim dyads persist, and as such, have strong reputations among peers. The current study will explore the relative level of power in aggressor-victim dyads, and assess how the power-related characteristics of aggressor-victim dyads predict the strength of the aggressor-victim relationship.

Multidimensionality of Power

Although power is frequently discussed in terms of aggressor-victim relationships and the use of aggression (e.g., Faris & Felmlee, 2011; Hawley, 2003; Pellegrini & Bartini, 2000; Pellegrini & Long, 2003), the type(s) of power thought to be important are unclear. In a review, Volk and colleagues (2014) discussed variations in the definition of power in relation to aggression, and suggested that power is multidimensional. However, research has yet to tackle the issue of which dimension(s) of power are important to the development and maintenance of the aggressor-victim relationship. Thus, there remains a lack of clarity regarding the dimensions under which power balance and imbalance operate. In the current study, I will assess power based on societal categories (i.e., gender and ethnicity), and power based on the peer group and social position within the peer group (i.e., social network centrality). These three conceptualizations of power are central to the use of aggression and have the potential to impact aggressors' motivations for targeting particular victims.

Societally, gender and ethnicity are commonly discussed as indicators of power and privilege. For instance, power structures in society suggest that males have more power than females (Blakemore, Berenbaum, & Liben, 2009; Gutek & Morasch, 1982; Pratto & Espinoza, 2001). Even among children, it has been suggested that boys' peer groups are more powerful than girls' (Leaper, 1994, 2000; Sroufe, Bennett, Englund, Urban, & Shulman, 1993). Similarly, power inequality can be seen based on ethnicity; the group who is in the majority has more privilege, political power, and control of resources (Pratto & Espinoza, 2001; Sidanius & Pratto, 1999). It should be noted, however, that ethnic majority status may depend on the context. That is, being in the *societal* ethnic majority (i.e., White) may not be the same as being in the ethnic majority of a particular social context. This distinction is important; researchers have found that ethnicity is not consistently related to power. That is, White youth (the societal ethnic majority) are not consistently rated as higher in power than other youth (Coie, Dodge, & Coppotelli, 1982; Kistner, Metzler, Gatlin, & Risi, 1993). However, youth in the ethnic majority within a particular classroom do have higher power than other ethnic groups. Therefore, those in the ethnic majority group *within a particular social context*, such as the classroom or school, likely have more power than those in the ethnic minority group.

Finally, another dimension of power is social network centrality. This is a form of social power, wherein power is necessarily contingent upon one's relationships with others (Narayanan, Tai, & Kinias, 2013; Overbeck & Park, 2001). Social network centrality assesses how central, or how well-connected one is relative to the peer group (Wasserman & Faust, 1994). It measures connection not just at the local level (i.e., number of friends), but at the wider peer network level as well (i.e., having connections

to friends who are also well-connected themselves). As such, occupying a central, prominent position within the social network affords those with high social network centrality high social power.

Dimensions of power in relation to aggression. Clearly power is multidimensional, yet it is unknown how these various conceptualizations of power should relate to the strength of the aggressor-victim relationship. Examining multiple indicators of power will allow me to determine how the power balance versus imbalance relates to the strength of the aggressor-victim relationship, as well as which indicators of power are more important than others. Because, to my knowledge, no research thus far has systematically examined various indicators of power in relation to aggressor-victim dyads, these goals are largely exploratory. Despite this, it is critical to assess these goals because understanding the type(s) of power associated with a stronger (versus weaker) aggressor-victim relationship will further contribute to the understanding of the ways in which aggressors target victims, and provide information on which power-related characteristics are most impactful in terms of a strong (albeit negative) aggressor-victim relationship.

The Current Study

The first goal of the current study was to describe the ways in which aggressor-victim dyads differed based on their power within the peer group. Specifically, I explored how dyads differed in terms of their gender, ethnicity, and social network centrality. It was expected that there would be variability in aggressor-victim dyads in terms of power balance versus imbalance. That is, it was expected that, in some dyads, aggressors would have higher power than their victims, whereas in others, aggressors and victims would

have relatively equal levels of power. Although there may be dyads wherein victims have higher power than aggressors, I expected that this would be less common than either of the other options. The second goal was to determine whether differences in dyadic power composition contributed to the strength of the aggressor-victim relationship (i.e., the reputational strength and sustained nature of the aggressor-victim dyad). That is, do aggressor-victim dyads with greater or lesser power differentials (based on gender, ethnicity, and social network centrality) have stronger relationships, as indicated by reputation and maintenance over time.

Method

Participants

Data were collected from sixth to eighth grade middle school students. Participants who completed questionnaires will be described first – questionnaires that included peer nominations of aggressors and victims. From these nominations, aggressor-victim dyads were identified, which served as the unit of analysis for tests of the hypotheses. Thus, I will also describe the analytic sample of aggressor-victim dyads.

Participants were sixth to eighth grade students drawn from a large, three wave longitudinal study of ethnic and gender identity development in early adolescence. Data were collected from students in a large ethnically diverse southwestern United States middle school in the spring of year 1 (Wave 1), fall of year 2 (Wave 2), and spring of year 2 (Wave 3). Data for the present study are drawn from the second and third waves (note: key measures were not included in the first wave). All students in the middle school ($N = 1056$) were recruited for participation by distributing information letters and consent forms (printed in both English and Spanish) to families. This study employed

passive consent, meaning that if parents did not specifically opt their child out of the study, consent was assumed. Recruitment procedures were approved by the participating school and the university Institutional Review Board.

At the time of Wave 2 data collection, 59 parents requested that their child not participate, 4 students refused participation at the time of the survey administration, 17 students had withdrawn from the school by the time of survey administration, and 18 students were absent from school during survey administration. Thus, the sample consisted of $N = 958$ participants at Wave 2 ($Ns = 340$ sixth graders, 302 seventh graders, and 316 eighth graders). Participants were between 10 and 14 years old ($M = 12.10$ years, $SD = .99$, 49.9% girls), with the majority coming from low socioeconomic status backgrounds (as indicated by students' free and reduced-price lunch status, provided by the school district; 79% were eligible for free lunches, 9% were eligible for reduced-price lunches). Participants self-identified as 44% Latino, 20% non-Latino White, 18% Black or African American, 9% American Indian or Alaska Native, 3% Asian, and 6% other. Most participants spoke English (45%), Spanish (8%) or both English and Spanish (44%) at home; the remaining 3% reported speaking other languages at home, including Vietnamese, Arabic, Marshallese, and Navajo. Forty-six percent of participants and their parents were United States (U.S.) born, 12% of participants were U.S. born with one parent foreign born, 30% were U.S. born with both parents foreign born, and 12% were foreign born with both parents foreign born. Almost half of participants came from two-parent married families (45%), with remaining participants coming from single parent families (33%) or two-parent, unmarried families (16%). Six percent of participants reported that they did not know their parents' relationship status.

Of those who participated at Wave 2, 84 had withdrawn from the school by Wave 3, and 44 were absent from school during survey administration (87% retention rate). The participants from Wave 2 who did not participate at Wave 3 were compared to retained participants; *t*-tests indicated that participants did not differ based on demographic information, with the exception of generational status (retained participants were more often foreign born with both parents foreign born, $t[952] = 2.11, p < .05$, or US born with both parents foreign born, $t[952] = 2.02, p < .05$, than participants who left after Wave 2).

Dyadic sample. Participants (described above) completed questionnaires, which included peer nominations of aggressors and their victims (details of the peer nomination procedure are described below). In Wave 2, the peer nomination of aggression and victimization consisted of three items, with one item each assessing relationally, physically, and verbally aggressive behavior (“Someone who gossips about others or excludes others”, “Someone who hits, kicks, or pushes others”, “Someone who calls others names or laughs at them” for relational, physical, and verbal aggression, respectively). These items have been frequently used to assess aggression and show large correlations or alphas when used in combination with other items (e.g., Farmer et al., 2003; Peeters et al., 2010). Participants were able to nominate up to three peers for each form of aggression. In Wave 3, a similar peer assessment was used; however, this measure only contained one item for aggression and victimization. Participants were first presented with a definition of aggression, which contained the items for relational, physical, and verbal aggression described above. As in Wave 2, participants were then asked to nominate up to three peers who fit that description. This resulted in 716 unique peers nominated as an aggressor at Wave 2 and/or at Wave 3.

For each peer nominated as an aggressor, participants were asked to nominate up to three peers that the nominated person directed his or her aggressive behavior towards. For example, the item in Wave 2 assessing relational aggression read “List one person who gossips about others or excludes others,” and the corresponding item assessing relational victimization read “Who does person 1 gossip about or exclude the most?” In Wave 2, participants could nominate up to three victims for each aggressor listed, for each item assessing aggression. In Wave 3, participants could nominate up to three victims for each aggressor listed for the one item assessing aggression. This resulted in 907 unique peers nominated as victims at Wave 2 and/or Wave 3.

The revised measure at Wave 3 is relatively comparable to the original measure at Wave 2, as indicated by a strong positive correlation between aggression at Wave 2 and Wave 3 ($r = .67, p < .001$) and a moderate positive correlation between victimization at Wave 2 and 3 ($r = .34, p < .001$) (at the individual level). In addition, the three items presented at Wave 2 were highly correlated (r s ranged from .46 to .62 for aggression, .39 to .48 for victimization, all p s $< .001$), again suggesting that the revised measure at Wave 3 that combines the three items is comparable.

Because victims were nominated as victims of specific aggressors, the peer nomination process resulted in aggressor-victim dyads, linked by each individual’s unique identifying number. Only individuals who had consent to participate and who attended the participating middle school at both Waves 2 and 3 (i.e., were able to be nominated by their peers at both waves) were included as aggressor or victim within aggressor-victim dyads. As such, across Waves 2 and 3, a total of 4834 unique dyads were nominated ($N = 2050$ 6th grade dyads, $N = 1164$ 7th grade dyads, $N = 1620$ 8th grade

dyads). Of the 716 unique aggressors nominated, 10% were the aggressor in only one aggressor-victim dyad. Ten percent of aggressors were aggressors in two aggressor-victim dyads (i.e., had two unique victims), 21% were aggressors in three aggressor-victim dyads, 41% were aggressors in between four and ten dyads, 15% were aggressors in between 11 and 20 dyads, and the remaining 3% were nominated as aggressors in anywhere from 21 to 65 dyads. Of the 907 unique victims nominated, 13% were the victim in only one aggressor-victim dyad (i.e., had only one unique aggressor), 14% were the victim in two aggressor-victim dyads, 12% were victims in three, 53% were victims in between four and ten dyads, 9% were victims in between 11 and 20 dyads, and the remaining .3% were nominated as victims in between 21 to 24 unique dyads. The fact that many aggressors and victims were nominated in multiple aggressor-victim dyads indicates that the data are nested (this will be explained in greater detail in the Results section). The aggressor-victim dyad was used as the unit of analysis to address all research questions in this study.

Procedure

At each wave of data collection, participants completed a questionnaire in their classrooms. Each item in the questionnaire package was read aloud by trained research assistants. Individualized assistance was provided as needed to adolescents who had difficulty completing the questionnaires (e.g., students with learning disabilities or language difficulties). The questionnaire package was administered on two consecutive days, and took approximately two hours to complete. Students received a small gift (a bracelet with the school's logo at Wave 2; a water bottle with the school's logo at Wave 3) as a token of appreciation for completing the survey.

As described above, peer nomination procedures were used to assess aggressors and victims. Peer nominations were also used to assess social network centrality. To complete the peer nominations, students were given a list of all peers in their grade (containing peers' first and last name, as well as a unique identifying number that was created for the study) and were instructed to think of peers in their grade that fit each description (i.e., aggressor, victim, friend). Participants were asked to record the peers' first name, last initial, and ID number. Participants were told that they could not nominate themselves, but that they could nominate the same person for more than one description. If they could not think of peers who fit a particular description, they were instructed to leave the space blank.

Measures

Relationship strength. Across Waves 2 and 3, some aggressor-victim dyads were nominated multiple times (i.e., the specific aggressor and victim were nominated *together* by multiple participants). Thus, to create a measure of relationship strength, I summed the number of times each unique dyad was nominated (see Rodkin et al., 2014). This sum included nominations both at Wave 2 and 3. As such, the measure of relationship strength represents both strength in terms of reputation as an aggressor-victim dyad, but also strength in terms of maintenance of the aggressor-victim relationship over time.

Power differential. Gender. Participants self-reported their gender as either girl or boy. Aggressor-victim dyads were then categorized as Girl-Girl (both aggressor and victim were female, 30%), Boy-Boy (both aggressor and victim were male, 35%), Boy-Girl (male aggressor, female victim, 20%), or Girl-Boy (female aggressor, male victim, 15%).

Ethnicity. As noted above, power in terms of ethnicity may be associated with belonging to the ethnic majority group within the school (Coie et al., 1982; Kistner et al., 1993). In this sample, the ethnic majority group was Latino; thus, I examined differences in the relationship strength of aggressor-victim dyads based on patterns of dyads who are Latino versus not Latino.

Participants self-reported their ethnicity and race, from which participants were categorized as either Latino (i.e., in the ethnic majority within the school) or not Latino (in the ethnic minority within the school). From these designations, dyad level ethnic composition was calculated. Aggressor-victim dyads were categorized as Latino (both aggressor and victim were Latino, 21%), Not Latino (neither aggressor nor victim were Latino, 35%), Latino-Not Latino (Latino aggressor, not Latino victim, 23%), or Not Latino-Latino (not Latino aggressor, Latino victim, 21%).

Social network centrality. Participants were asked to nominate up to 10 of their closest friends in their grade. Because students were able to nominate any peer within their grade, peer networks were identified at the grade level. This is beneficial because, unlike elementary school, wherein the entire peer network is typically the classroom; in middle school, the peer network is typically the entire grade. That is, in middle school, students move from class to class throughout the school day, and thus have associations with many grademates. As such, allowing for nominations at the grade level prevents the peer network from being artificially truncated into smaller groups.

Each individual within the social network is called a *node*, and a friendship nomination is a directional arrow between two nodes. That is, if individual *i* nominates *j* as a friend, there is an arrow (i.e., a friendship tie) from *i* to *j*. Social network centrality

(operationalized as *Bonacich centrality*; Bonacich, 1987; Wasserman & Faust, 1994) was calculated for each individual by weighting the number of ties (i.e., friendships) each individual had with the number of ties each of his or her friends has. That is, social network centrality is based not only on one's direct friendships, but also on friends of friends within the entire grade-level network. Thus, youth have high social network centrality if they are connected with many others within the network who themselves are well connected (Wasserman & Faust, 1994). In contrast, youth have low social network centrality if they have few friends, and if the friends they have are not well connected. A difference score for each aggressor-victim dyad was then calculated by subtracting the victim's social network centrality score from the aggressor's centrality score. Thus, this score could be positive, negative, or close to 0. In order to test whether a power balance versus imbalance *regardless of whether aggressor or victim is higher in power* impacts relationship strength (i.e., non-linear effects), I also created an absolute value term for social network centrality (i.e., to remove directionality), such that dyads with a power imbalance (with either aggressor or victim having higher power) had a high score, and dyads with relative equality in terms of power had a value close to 0.

Covariates. Participants self-reported their grade (sixth, seventh, or eighth grade). In addition, although students moved between classes with different peers throughout the day, data were collected in participants' social studies classrooms. Thus, information was collected regarding whether aggressor-victim dyad were in the same social studies class or not (dummy coded, wherein sharing a social studies classroom = 1). Both grade and belonging to the same social studies class likely increase contact among participants, and

thus might be related to the likelihood of being in an aggressor-victim dyad. As such, grade and sharing a social studies classroom were included in analyses as covariates.

Results

The first goal of this study was to describe the variability in terms of aggressor-victim dyads' power differential. To explore this variability, the descriptive properties of aggressor-victim dyads based on three indicators of power (gender, ethnicity, and social network centrality) were examined. The second goal was to determine how the power differential between aggressor-victim dyads was related to the strength of the aggressor-victim relationship. Using multilevel modeling procedures, I assessed whether each power indicator (separately) was associated with relationship strength.

Descriptive Analyses

Relationship strength, which was measured as the number of times a dyad was nominated by peers at Waves 2 and 3, ranged from 1 to 12 ($M = 1.21$, $SD = .67$). Eighty-six percent of dyads were nominated once, 10% were nominated twice, 3% were nominated three times, and the remaining 1% were nominated between four and twelve times. A log transformation was used to correct for non-normality in the relationship strength variable. No other dyadic variables required transformation.

The Aggressor-Victim Power Differential

The first goal of the current study was to examine variability in the power differential between aggressors and victims, using three indicators of power (gender, ethnicity, and social network centrality). It was hypothesized that there would be variability in terms of power; I expected many dyads wherein the aggressor had higher power than the victim (i.e., dyads with male aggressor and female victim; dyads with

Latino aggressor and Not-Latino victim, and dyads wherein aggressor had higher social network centrality than victim), as well as many dyads wherein aggressor and victim had relatively equal power. I expected fewer dyads wherein the victim had more power than the aggressor.

To explore power in terms of gender, a chi-square test was used to determine whether there was a relation between aggressors' gender and victims' gender within a dyad; the chi-square test indicated a significant relation, $\chi^2(1) = 426.25, p < .001$. By examining the standardized residuals above 2.0, we see that there were more Girl-Girl dyads (30% of total, standardized residual = 10.80) and Boy-Boy dyads (35% of total, standardized residual = 9.80) than expected, and fewer Girl-Boy dyads (15% of total, standardized residual = -10.80) and Boy-Girl dyads (20% of total, standardized residual = -9.90) dyads than expected. For power based on gender, I operated under the assumption that males have higher power than females (Blakemore et al., 2009; Gutek & Morasch, 1982; Pratto & Espinoza, 2001). Thus, these results suggest that, as expected, there were relatively few dyads representing a lower powered aggressor targeting a higher powered victim (i.e., Girl-Boy). However, there were more dyads representing relative equality in power between aggressor and victim (i.e., Girl-Girl and Boy-Boy) than there were dyads in which the aggressor had more power than the victim (i.e., Boy-Girl). As such, this suggests that relative equality in gender-based power was more common than a power differential between aggressor and victim.

Findings for ethnicity were fairly similar; the chi-square test also indicated a relation between ethnicity of aggressor and victim, $\chi^2(1) = 56.16, p < .001$. Here, there were more Latino dyads than expected (21%; both dyad members were Latino,

standardized residual = 4.20), as well as more Not Latino dyads than expected (35%; both aggressor and victim not Latino, standardized residual = 3.20). There were fewer Latino-Not Latino dyads (23%; Latino aggressor, not Latino victim, standardized residual = -3.60) and Not Latino-Latino dyads (21%; not Latino aggressor, Latino victim, standardized residual = -3.80) than expected. As with gender, these findings suggest that there were more dyads with relative equality in power based on ethnicity than those with a power differential. Interestingly, there were a similar number of dyads wherein the aggressor had higher ethnic-based power (i.e., Latino) than the victim as there were dyads wherein the victim had higher ethnic-based power than the aggressor.

I also examined descriptive properties of the dyadic measure of social network centrality. Social network centrality (i.e., the difference score between aggressors' and victims' social network centrality scores) ranged from -1.84 to 1.73 ($M = -.02$, $SD = .62$, skewness = $-.05$, kurtosis = $-.10$). Although skewness and kurtosis were quite low, a Kolmogorov-Smirnov test (which is appropriate for samples with $N > 2000$) indicated that social network centrality was not normally distributed, Kolmogorov-Smirnov statistic = $.03$, $df = 4364$, $p < .001$. Given the negative skew, this indicates that, as expected, there were more dyads with positive social network centrality (i.e., the aggressor has more power than the victim) than there were dyads with negative social network centrality (i.e., the victim has more power than the aggressor). However, examining the distribution of social network centrality visually indicates that the majority of dyads have a social network centrality score close to 0, such that aggressor and victim have relative power equality in terms of social power (see Figure 3). Together, these findings suggest that there was a tendency towards power equality in aggressor-victim

dyads (specifically in terms of gender and ethnicity), and a slightly lower tendency for dyads wherein victims have higher power than their aggressor (specifically in terms of gender and social network centrality).

Relations among Power Variables

I also conducted exploratory analyses to determine how gender-based, ethnicity-based, and network centrality-based power indicators were related to one another. A chi-square test indicated an association between dyadic gender and ethnicity, $\chi^2(9) = 24.30, p = .004$. By examining standardized residuals above 2.0, results indicated that there were more Girl-Boy dyads who were Latino-Not Latino (4% of total, standardized residual = 2.2), and fewer Girl-Boy dyads who were Latino (3% of total, standardized residual = -2.3) than expected (see Table 5 for frequencies of dyads across all gender and ethnic groups). Interestingly, it was hypothesized that Girl-Boy dyads would represent dyads wherein the victim had more power than the aggressor, but that Latino-Not Latino dyads would represent dyads wherein the aggressor had more power than the victim. Thus, seeing more Girl-Boy/ Latino-Not Latino dyads than expected indicates that power is not necessarily congruent across indicators of power.

Next, I assessed how power based on gender related to power based on social network centrality. A univariate analysis of variance (ANOVA) was computed to assess whether dyads in different gender group categories differed in social network centrality. Results indicated that gender groups did significantly differ on social network centrality, $F(3, 4360) = 270.82, p < .001, \eta^2 = .16$. Specifically, Girl-Boy dyads ($M = .42$) had a higher dyadic social network centrality score (indicating aggressors had higher social network centrality than victims) than any other gender group ($ps < .001$). Further, Girl-

Girl ($M = .01$) and Boy-Boy ($M = -.01$) dyads had social network centrality scores very close to 0 (indicating relative equality in social network centrality of aggressor and victim), which significantly differed from the social network centrality of Boy-Girl dyads ($M = -.42$; $ps < .001$). That is, Boy-Girl dyads had negative social network centrality scores, indicating that victims had higher social network centrality than aggressors. This again highlights the complexity of the multidimensionality of power. For instance, Girl-Girl and Boy-Boy dyads had a balance of power in terms of gender, and were also relatively balanced in power in terms of social network centrality. However, when looking at cross-gender dyads, girls were higher in social network centrality than boys regardless of whether they were the aggressor or victim.

A similar analysis of variance comparing ethnic group category on social network centrality indicated no significant differences in social network centrality for those in various ethnic category groups, $F(3, 4243) = 1.82$, $p > .05$, $\eta^2 = .001$.

Associations between the Power Differential and Relationship Strength

The second goal of this study was to examine the association between dyadic level indicators of power and dyadic relationship strength. As was stated in the Method section when describing the analytic sample of dyads, the data are nested in two ways. Specifically, dyads are nested within aggressor (multiple dyads can contain the same aggressor). Second, dyads are nested within victim (multiple dyads can also contain the same victim). Intra-class correlations showed that 5.15% of the variance in relationship strength was due to nesting within aggressor, and 2.89% was due to nesting within victim. Multilevel modeling procedures in *Mplus 7* were used to account for the nested structure of the data, using robust maximum likelihood (MLR) estimation. Given the

extreme complications of nesting within both aggressor and victim simultaneously, analyses were first run accounting for nesting within aggressor, and then the same models were run accounting for nesting within victim. Separate models were assessed for each indicator of power: gender, ethnicity, and social network centrality. Models were specified using TYPE = TWOLEVEL, with dyadic power predicting relationship strength (Level 1). Sharing a social studies classroom (Level 1) and grade (Level 2) were included as covariates. Likelihood ratio chi-square tests using the Satorra-Bentler Scaled chi-square (for use with MLR estimator) were computed to assess overall model significance, comparing a baseline model (with path coefficients fixed at 0) to a full model (allowing for variables to predict relationship strength) (Satorra, 2000).

For models with categorical indicators of power (i.e., gender, ethnicity), sets of four models were estimated in which a dummy code for each dyadic power variable was systematically removed to serve as the reference group (Curby et al., 2009; Gaias, Abry, Swanson, & Fabes, 2015). This approach allowed me to determine between which groups potential differences in relationship strength lie (i.e., testing all pairwise comparisons), given that there is no clear justification for which group should serve as a reference group. For social network centrality, which was a continuous indicator of power, this variable was simply entered into the model (Level 1). The absolute value for social network centrality (Level 1) was also included, to examine whether dyads with relatively equal power have stronger relationship strength than dyads wherein *either* aggressor or victim is higher in power. Note that, in the model with social network centrality, I also tested for moderation by dyad gender group category, as well as dyad ethnic group

category; however, no consistent patterns of moderation were found. Thus, for simplicity, separate models for each power indicator are presented here.

Gender. Models were run nested within both aggressor and victim. Results were virtually identical, with one exception (see below); results for the model nested within aggressor are reported. The Satorra-Bentler scaled chi-square difference test indicated that the full model (log likelihood [LL] = -9604.68, scaling correction factor [SC] = 3.04) fit better than the model with no predictors (LL = -9617.29, SC = 3.65), $\chi^2(5) = 23.46, p < .001$. Shared classroom significantly predicted relationship strength ($b = .04, p = .02$), but grade did not ($b = .00, p > .05$). After systematically removing each dyadic gender variable to serve as a reference group, results indicated that dyads where both aggressor and victim were female (Girl-Girl) had marginally higher relationship strength than dyads where both were male (Boy-Boy; $b = .03, p = .07$; note that this was not significant when nested within victim; $b = .02, p > .05$), and significantly greater relationship strength than dyads with female aggressor and male victim (Girl-Boy; $b = .06, p < .001$) or dyads with male aggressor and female victim (Boy-Girl; $b = .04, p = .01$). Further, Boy-Boy dyads had stronger relationships than Girl-Boy dyads ($b = .04, p = .01$). Figure 4a shows the values of relationship strength for dyads within each group. Overall, these results suggest that dyads with relative equality in terms of gender power had stronger relationships than dyads with a power imbalance.

Ethnicity. As with gender, models were run nested within both aggressor and victim, and results were virtually identical. For simplicity, results for the model nested within aggressor are reported. The Satorra-Bentler scaled chi-square difference test indicated that the full model (LL = -9596.47, SC = 2.89) fit better than the model with no

predictors (LL = -9602.82, SC = 3.46), $\chi^2(5) = 11.79, p = .04$. Shared classroom significantly predicted relationship strength ($b = .04, p = .03$), but grade did not ($b = .00, p > .05$). Each dyadic ethnicity variable was removed to serve as a reference group; results indicated that dyads where both aggressor and victim were Not Latino (i.e., were in the ethnic minority within the school) had higher relationship strength than dyads with Not Latino aggressors and Latino victims ($b = .03, p = .02$). Figure 4b illustrates values of relationship strength for dyads within each ethnicity group.

As a follow up, I re-ran these analyses using a) only White youth as the Not Latino group, and b) other ethnicities (i.e., not Latino and not White) as the Not Latino group. These analyses indicated that White dyads did not have elevated relationship strength compared to other types of dyads. In fact, White dyads had lower relationship strength than Latino dyads ($b = .05, p = .047$) and dyads with Latino aggressor and White victim ($b = .06, p = .046$). When considering Not Latino as all other youth besides Latino and White youth, a similar pattern to the original results were found; “other” ethnicity dyads were higher on relationship strength than all other dyads ($bs \leq -.04, p \leq .04$)

Social network centrality. Just as before, models nested within both aggressor and victim were virtually identical; results for the model nested within aggressor are reported. The Satorra-Bentler scaled chi-square difference test indicated that the full model (i.e., the model with social network centrality and the absolute value of social network centrality; LL = -11000.86, SC = 3.72) fit better than the model with no predictors (LL = -11010.05, SC = 4.58), $\chi^2(4) = 16.12, p = .006$. Shared classroom significantly predicted relationship strength ($b = .04, p = .03$), but grade did not ($b = .00, p > .05$). The social network centrality indicator did not significantly predict relationship

strength ($b = -.01, p > .05$), but the absolute value of social network centrality did ($b = -.04, p = .006$), indicating that dyads relatively equal in social network centrality had higher relationship strength than dyads wherein either aggressor or victim was higher in social network centrality than the other member of the dyad.

Discussion

When an aggressor repeatedly targets the same victim, a relationship forms between them. A relationship between aggressor and victim that is strong and sustained over time is problematic because it likely signifies antipathy and negativity and because it can lead to adjustment problems for both the aggressor and the victim (Abecassis et al., 2002; Ladd & Burgess, 1999). Although the use of power is often cited as a key factor in an aggressor's targeting of his or her victims, relatively little is known about how power operates within an aggressor-victim dyad, and how differences versus similarities in power may relate to the strength of the aggressor-victim relationship. In this study, I sought to address this issue by examining variability in power within the aggressor-victim dyad, by assessing whether a balance or imbalance of power was associated with relationship strength and by considering several indicators of power. Across three indices of power (gender, ethnicity, and social network centrality), I found that there was substantial variability in dyadic power, but more dyads were characterized by a power balance than imbalance. Further, I found that a balance of power (particularly in terms of gender and social network centrality) was associated with stronger aggressor-victim relationships, whereas a larger power differential was associated with weaker relationships. These findings address several novel questions and greatly contribute to the understanding of power within the aggressor-victim relationship.

Exploring the Power Differential between Aggressors and Victims

The first goal of this study was to examine the power differential between aggressors and victims. Across all indices of power, there were more balanced than imbalanced aggressor-victim dyads. To illustrate, there was evidence that many aggressor-victim dyads were relatively equal in social network centrality. Moreover, same-gender dyads (Boy-Boy and Girl-Girl) and same-ethnic dyads (Latino dyads and Not Latino dyads) were more predominant than mixed-gender and mixed-ethnic dyads. When using the ethnic-based index of power, the strongest evidence for the idea that aggressor-victim dyads tend to be balanced comes from the preponderance of Latino dyads (i.e., both aggressor and victim were Latino). On the surface, the relatively large number of Not Latino dyads do support the balance finding, but it is important to keep in mind that Not Latino dyads do not necessarily share an ethnic group (i.e., non-Latinos could have been White, African American, American Indian, etc.). Thus, though members of Not Latino dyads were considered to have low power (because they were in the numerical ethnic minority within the middle school), it is possible that these dyads were not *balanced* in power because aggressor and victim may have been different ethnicities. Despite this, there were more Latino dyads than expected, supporting the notion that power balanced dyads were common. These findings are in line with prior research that has similarly found aggressor-victim dyads to be relatively equal in power, using power indices based on gender (i.e., same-gender aggressor-victim dyads are more common than mixed-gender dyads; Dyches & Mayeux, 2012; Seals & Young, 2003) and social position (i.e., researchers have reported aggression occurring within social groups

and within cliques, suggesting that aggressor and victim occupy similar levels of social power; Dyches & Mayeux, 2012; Jamal et al., 2015; Merten, 1997).

From a social dominance perspective, it may be that targeting a victim relatively equal in power to oneself is beneficial in that the aggressor can gain more rewards (Adler & Adler, 1995; Andrews et al., under review; Peets & Hodges, 2014). For instance, an aggressor targeting a similarly socially central victim may be effective in diminishing the victim's social power, while simultaneously improving his or her own social standing. Or, targeting a same-gender peer may provide more social rewards (e.g., a girl gossips to her friends about another girl within the group, thereby strengthening the aggressor's relationship with her peers) than would engaging in mixed-gender aggression.

The higher prevalence of power balanced versus imbalanced dyads stands in contrast to some extant work that has reported more dyads characterized by a power differential than equality in power (e.g., Rodkin & Berger, 2008 reported twice as many male-female aggressor-victim dyads than male-male dyads), or that have failed to find differences in dyads based on power (e.g., in work using a predominantly Dutch sample, no differences were found between the amount of *inter- and intra-ethnic* bullying; Tolsma, van Deurzen, Stark, & Veenstra, 2013). However, I did find substantial variability in dyadic power across aggressor-victim dyads. That is, although I found more power balanced than imbalanced dyads, there were certainly dyads wherein boys aggressed against girls (20%) or wherein non-Latino youth aggressed against Latino youth (21%), for example. Thus, these results show that there are aggressor-victim dyads that cover the spectrum of dyadic power, including a number of dyads wherein the victim has more power than the aggressor. This has important practical implications; for

instance, teachers and parents should be aware that an aggressor-victim relationship can exist for youth at all levels of power, based on multiple conceptualizations of power.

Multidimensionality of Power

A strength of this study was that I considered multiple indicators of power simultaneously, which allowed me to explore the complexity of power within aggressor-victim dyads. For instance, in Boy-Girl dyads (male aggressors, female victims), girls were more socially powerful than boys (i.e., had higher social network centrality). Rodkin and Berger (2008) obtained a similar finding in their study of preadolescent youth, with unpopular boys aggressing against popular girls. Thus, on one dimension of power – namely gender – the aggressor was more powerful than the victim; but, on another dimension of power – namely social centrality – the victim was more powerful than the aggressor. Compare this finding with the finding that, for Girl-Boy dyads, girls were again more socially powerful. Again, in this case, the aggressor was more powerful than the victim on one dimension (social centrality) but less powerful on another (gender). Interestingly, in both cases of mixed gender aggressor-victim dyads, girls were more socially powerful, regardless of whether they were aggressor or victim. Similarly, in Girl-Boy aggressor-victim dyads, there were more cases of Latino aggressors targeting not Latino victims than expected. These findings highlight the uniqueness of mixed-gender aggressor-victim dyads. Some research has focused heavily on male aggression or girls' same-gender aggression, to the omission of girls' cross-gender aggression (e.g., Merten, 1997; Olweus, 1978; Rodkin & Berger, 2008). Yet, these findings suggest that Girl-Boy dyads may be particularly interesting to examine further, given how powerful these aggressive girls may be, in terms of other power indicators. More research is

needed to further understand the nature of the relationship between aggressive girls and victimized boys.

It is worth noting that assumptions about gender-based power depend on the idea that males have more societal power than females (Blakemore et al., 2009; Gutek & Morasch, 1982; Pratto & Espinoza, 2001). In fact, Rodkin and Berger (2008) also argued that, despite female victims of male bullies being more popular (i.e., having more social power), girls can still be viewed as having less power based on physical strength (i.e., physical power). Thus, again this suggests that power is multidimensional. Just as Rodkin and Berger found, current results suggest that indices of power may not always be congruent. That is, being powerful on one dimension was not necessarily associated with being powerful on another dimension. Recently, Volk et al. (2014) discussed how extant work has utilized several conceptualizations of power, including some not considered in the present study (e.g., physical strength, cognitive skills or verbal fluency). Thus, future work might expand the assessment of the multidimensional nature of power (beyond that of gender, ethnicity, and social network centrality), to further increase our understanding of the dimensions of power and how they relate to one another.

The Relation between Power and Aggressor-Victim Relationship Strength

The second main goal of this study was to determine how the power differential between aggressor and victim impacted the strength of the aggressor-victim relationship. Dyads that were relatively balanced in power had stronger aggressor-victim relationships than those who had a power imbalance. This was clearly evident for indices of gender-based and socially-based power, although less straightforward for ethnic-based indices. Specifically, same-gender aggressor-victim dyads had higher relationship strength than

mixed-gender dyads, and the absolute value of social network centrality negatively predicted relationship strength, indicating that dyads with a smaller difference score on social network centrality (i.e., those with balanced power) had higher relationship strength than dyads with larger difference scores (regardless of whether it was aggressor or victim who was higher in social network centrality than the other). Results were less robust when considering ethnicity, yet supported the findings noted above. That is, Not Latino dyads had higher relationship strength than dyads with not Latino aggressors and Latino victims, again suggesting that a balance of power was associated with higher relationship strength than power inequality.

Explanations for the potential link between power and the aggressor-victim relationship are grounded within a social dominance approach. As outlined above, it may be that aggressors who target victims similar in power to themselves are able to gain more social rewards or resources than aggressors who target victims much lower in power than themselves (Adler & Adler, 1995; Peets & Hodges, 2014). In fact, in a recent study, my colleagues and I found that targeting high status victims was associated with aggressors themselves being high in status and increasing in status over time (measured as social network prestige; Andrews et al., under review). The current findings add to this by indicating that, not only are there aggressors who target victims similar to themselves in power, but that this type of targeting is associated with stronger and more sustained relationships (at least based on gender and social network centrality). Findings also highlight that aggressor-victim relationships that are characterized by relative equality in terms of power are particularly problematic, given that they are likely to endure over time.

Limitations and Future Directions

When examining power based on ethnicity, results did not indicate robust findings relating dyadic ethnicity and relationship strength. This may be because power was examined based on ethnicity within the particular middle school sampled. That is, hypotheses were made from the standpoint that Latino youth would be more powerful than non-Latino youth, given that Latinos were the majority ethnic group within the particular school setting (Coie et al., 1982; Kistner et al., 1993). This is important, considering that the ethnic composition of the school provides a unique social context that should be considered. That is, I allowed the specific school context being studied to inform hypotheses. Further, I did conduct follow-up analyses where White youth (the *societal* ethnic majority) were separated from other non-Latino youth and again did not find a robust pattern of findings, suggesting that the lack of results was not due to decisions made based on ethnic power categorization. However, because the sample consisted of only one middle school, I was unable to compare findings across schools or to compare findings to schools wherein Latino youth were not in the ethnic majority. Future research is necessary to examine ethnic power within schools of varying ethnic compositions.

Relationship strength was measured by summing the number of nominations of each unique aggressor-victim dyad across Waves 2 and 3. Given that nominations could be made at the grade-level, there were a large number of potential aggressor-victim dyads. Thus, I found that there was limited variability in the number of times a particular aggressor-victim dyad was nominated at either Wave 2 or 3 separately. This is why nominations across Waves 2 and 3 were combined to calculate relationship strength.

However, by calculating relationship strength in this way, the *reputational strength* of the relationship is confounded with how *sustained* the relationship was over time. That is, the measure of relationship strength is a combined index of both how well known a particular aggressor-victim was (i.e., reputational strength) as well as how well known they were *over time* (i.e., sustained). Although this approach was necessary given the nature of the data, it means that we cannot be sure how the reputational strength and the sustained nature of an aggressor-victim relationship separately relate to power within the dyad. Future work is needed to refine the measurement of the aggressor-victim relationship, particularly to examine how power might differentially relate to both the reputational strength and the sustained nature of the relationship. Further, the measure was based on youth's reputation as an aggressor and victim pair. Future work could expand upon this approach and measure instances of aggression or severity of aggression between specific aggressor-victim pairs to gain a better understanding of the nature of the actual aggressive behavior being displayed within these relationships, rather than assess the aggressor-victim relationship based on reputation. Nonetheless, the current study provides an important starting point to expanding and explaining the nature of the aggressor-victim relationship.

The results of the current study importantly highlight how power dynamics are associated with aggressor-victim dyad relationship strength. Based on a social dominance approach, it was suggested that aggressors may target equally powered victims to gain the maximal amount of social rewards (e.g., Adler & Adler, 1995; Peets & Hodges, 2014). However, there are other explanations as to *why* a balance of power may relate to strong and sustained aggressor-victim relationships. For instance, it might be that aggressor-

victim dyads that are equal in terms of power have stronger relationships because they have more contact – perhaps they are friends with one another. Some aggression does exist among friends (Mishna et al., 2008; Waasdorp et al., 2010; Wei & Jonson-Reid, 2011), thus aggressors and victims who are friends with one another may be more likely to be balanced in power and have more contact with one another (and thus more opportunities for aggression). Additionally, aggression among equal-powered aggressor-victim dyads may be reciprocal. That is, it may be that aggressors target victims of a similar level of power and those victims retaliate or reciprocate the aggression. Mutual aggression is likely to be sustained (and increase in severity) over time (Murray-Close & Crick, 2006; Rodkin et al., 2003), thus dyads who engage in reciprocal aggression would likely have stronger relationships. Given these possible alternative explanations, more research is needed to assess the context of the aggressor-victim relationship. For instance, what is the nature of the relationship aside from power (e.g., are aggressors and victims friends with one another; do they share a peer group)? What does the aggression look like when it is occurring (e.g., is it reciprocal)? Answering these additional questions could add to the important findings in the current study and further illustrate why some aggressor-victim dyads may have stronger (and more negative) relationships than others.

Implications and Conclusions

This study addressed several novel areas, including how aggressor-victim dyads vary with regard to power balance versus imbalance, how this power differential impacts the strength of the aggressor-victim relationship, and how power can be conceptualized in multiple ways. Overall, there were more aggressor-victim dyads characterized by relative power equality than dyads characterized by a power differential. Further, dyads that were

balanced in power had stronger relationships than dyads that were imbalanced in power (at least when assessing gender and social network centrality). Lastly, by including multiple indicators of power (gender, ethnicity, and social network centrality), I have shown that power operates differently depending on its conceptualization. Results have important practical implications for parents and teachers. For instance, results indicate that aggressors and victims who are relatively equal in power (at least in terms of gender and social power) may be the most problematic in that the aggressor-victim relationship may be maintained over time. More generally, findings highlight the importance of considering aggressor-victim relationships using a dyadic approach and assessing the complexity that exists within youth's relationships. Given that the power dynamic between aggressor and victim appears to play a role in the maintenance of this negative relationship, researchers and interventionists should make examining the dyadic nature of power a priority to mitigate aggressor-victim relationships and decrease some of the harmful effects associated with a strong and sustained aggressor-victim relationship.

CHAPTER 5

GENERAL DISCUSSION

Peer-directed aggression is, at its core, a social phenomenon (Salmivalli et al., 1996). From children's playground or classroom bullying to gang violence and organized crime, aggression involves social processes and the social groups with which individuals are involved (Craig et al., 2000; Venkatesh, 1997). However, despite the inherently social nature of aggression, there remains much that is unknown about way in which aggression impacts relationships, about social processes associated with aggression, and about the multifaceted and changing ways that relationships can affect aggression. For instance, much extant research takes a simplistic view of peer relationships, considering a single best friend instead of multiple friendships (e.g., Adams et al., 2005). Further, there are contradictions in the field regarding, for example, what the power dynamic between aggressor and victim is expected to be (Dyches & Mayeux, 2012; Merten, 1997; Olweus, 1978). Thus, the goal of the present research was to explore the relational nature of aggression, taking into account the nuance and complexity of real relationships, considering social processes through which aggression is associated with aspects of relationships, and considering multiple forms of relationships. This research included an examination of the impact of friendships on the use of aggression, the potential for aggression to affect interaction quality and the initial formation of a relationship, and explored the unique relationship between aggressor and victim and the role that power plays within that relationship. I took dyadic or network perspectives to allow for and assess complexities in real relationships that are often ignored when examining individual-level correlates of aggression. Broadly, the present findings have the ability to

further our understanding of aggression, particularly as it relates to peer relationships, social processes, and power relations within the social network. Given the dangerous and broad reaching consequences of aggressive behavior (e.g., Eron & Huesmann, 1984; Farrington, 1993; Roff, 1992), gaining a deeper understanding of the uniquely social nature of aggression is essential to our ability to decrease youth's perpetration of and involvement in aggressive behavior.

Study 1 examined how both structural and behavioral features of the local friendship network impacted aggressive behavior, concurrently and over time. Taking a network perspective that extended past research that has often focused on single *best friend* relationships (e.g., Adams et al., 2005), I found that youth with larger friendship networks were more aggressive concurrently, yet those with highly interconnected networks (i.e., had many friends who were friends with one another) decreased in aggression over time. This study not only highlighted the direct ways that friendship networks are associated with aggression, but it serves as the first step toward a better understanding of the distinct ways in which structural features of the friendship network can impact concurrent and longitudinal processes associated with aggression.

In Study 2, I took a different approach and considered the impact of aggression on youth's interaction quality. Taking a dyadic perspective, such that the behavioral tendencies of youth involved in an interaction were considered in relation to one another, I found that youth more discrepant in their use of aggression struggled to collaborate with one another, and this subsequently (negatively) impacted their perceptions of one another. To my knowledge, this is the first study to examine the social processes through which aggression can impact one's potential to form relationships with peers (with the

exception of Dodge's study of second grade boys; Dodge, 1983). This is particularly important in that it provides an avenue through which positive, healthy (i.e., non-aggressive) peer relationships can be encouraged for youth with tendencies toward aggression. That is, perhaps increasing collaboration and positive interactions, particularly between youth who are discrepant in their use of aggression, can support the formation of good quality peer relationships.

Rather than considering relationships with friends or potential friends, Study 3 examined the relationship between aggressor and victim. I explored the power balance versus imbalance between aggressor-victim dyads, and how power impacted the strength and longevity of this harmful relationship. I found that, though there was considerable variability in the power dynamics between aggressor and victim, there were more dyads that were balanced than imbalanced in power. This was true when considering multiple conceptualizations of power, including societal categories (i.e., gender and ethnicity) and power based on social power or position within the peer group (i.e., social network centrality). Further, I found that these power balanced dyads had stronger and more sustained relationships than imbalanced dyads. Once again, by taking a dyadic approach and considering links between aggressor and victim, this study addressed several novel areas of research. These results are an important starting point to better understand the nature of the aggressor-victim relationship, the role of power in this relationship, and a potential explanation for why certain aggressor-victim dyads are particularly long lasting and pernicious.

Together, these results greatly advance the field of research on aggression. There exist views of youth's aggressive behavior wherein aggressors are viewed as isolated and

rejected from the peer group, with few friends (Dodge, 1983; Hektner et al., 2000; Rys & Bear, 1997). Aggressors are often thought to have behavioral issues and difficulties getting along with peers, and to target victims that are also weak, friendless, and have social adjustment issues (Hodges & Perry, 1999; Prinstein, Boergers, & Vernberg, 2001; Stenseng et al., 2014; Storch & Ledley, 2005). The results of the present research, along with other research that my colleagues and I have conducted, challenges these views; the findings reported here clearly show a different picture of aggressors. Here, I found that aggressors may have many friends and may, in fact, be able to use aggression and use their interactional style to form new friendships (particularly with other aggressive peers; Study 1; Study 2). Further, aggressors target victims who are similar to themselves (in terms of gender and ethnicity; Study 3). In fact, in the current studies and in my prior research, I have found that aggressors may occupy central, prominent, and prestigious positions within the peer group, may target similarly central and prominent victims, and that this may be effective in improving their own prestige within the peer group (Study 3; Andrews, Hanish, Martin, & Santos, under review; Andrews et al., 2016). This has important theoretical implications. For instance, much of this dissertation is based within evolutionary theories of aggression, which specify that aggression may be used to manipulate peer relationships. Results advance theorizing by suggesting that an individual's aggression alone may not be enough to manipulate one's relationships, but that examining aggression in conjunction with one's peers provides a better understanding of the potential impact of aggression on relationships. For instance, I found that it was the *discrepancy* in aggression between interaction partners or the specific power *dynamic* between aggressor and victim that can affect the relationship.

From a practical standpoint, those who work with aggressive youth, such as parents, teachers, policy makers, and interventionists, might have new insights to guide their attempts to structure peer relationships in ways that are healthy and that minimize the continuation of aggression. For example, these studies showed the importance of both close friendships and the unique role of the aggressor-victim relationship. Although the current studies focus on youth's aggression, the questions asked and issues addressed are applicable to the study of aggression and violence across a wide range of developmental periods, contexts, and populations. That is, the use of aggression and violence is entrenched in social groups and relationships. By considering and exploring the complexity and nuance in social relationships and social processes, we extend our ability to understand human aggression, and as such, can make strides in decreasing involvement in this harmful behavior. It is my hope that the present research (in conjunction with other work) encourages researchers to take a relational perspective on aggression.

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APPENDIX A

TABLES 1-5

Table 1

Means and Standard Deviations of Study Variables

	<i>M</i>	<i>SD</i>	Range
Aggression (Wave 2)	1.00	.78	.00 – 3.92
Aggression (Wave 3)	.38	.56	.00 – 2.94
Size	2.48	1.95	.00 – 10.00
Interconnectedness	.20	.28	.00 – 1.00
Friends' Average Aggression	1.17	.63	.00 – 3.40

Note. $N = 874$. Aggression (Waves 2 and 3) and Friends' Average

Aggression were log transformed.

Table 2
Correlations among Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
Study Variables													
1. Aggression (W2)	--	.49***	.12***	-.04	.35***	.07	-.15***	.02	-.05	.11**	-.04	.28***	.24***
2. Aggression (W3)		--	.06	-.09*	.24***	.10**	-.05	.04	-.06	.12***	-.02	.18***	.21***
3. Size			--	.03	.19***	-.30***	-.04	.02	.01	-.08*	-.06	.10**	.20***
4. Interconnectedness				--	-.02	-.14**	-.16***	.00	.01	-.03	-.04	-.01	-.03
5. Friends' Average Aggression					--	.05	-.12**	.04	.01	.06	-.02	.81***	.80***
Covariates													
6. Gender						--	-.01	.06	-.09*	.04	.01	.09*	.04
7. Grade (Seventh)							--	-.48***	-.06	-.06	.04	-.11**	-.09*
8. Grade (Eighth)								--	-.15***	.02	.00	.05	.05
9. Ethnicity (White)									--	-.23***	-.23***	.00	-.03
10. Ethnicity (Black)										--	-.21***	.06	.10*
11. Ethnicity (Other)											--	-.03	-.07
12. Prop of Highly Aggressive Friends												--	.63***
13. Variability in Friends' Aggression													--

Note. $N = 874$. W2 = Wave 2. W3 = Wave 3. Prop = Proportion. Aggression, Friends' Average Aggression, and Variability in Friends' Aggression were log transformed. Gender is coded as girls = 0, boys = 1. Grade (Seventh) is coded as sixth grade = 0, seventh grade = 1. Grade (Eighth) is coded as sixth grade = 0, eighth grade = 1. Ethnicity (White) is coded as Latino = 0, White = 1. Ethnicity (Black) is coded as Latino = 0, Black = 1. Ethnicity (Other) is coded as Latino = 0, other = 1.

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

Table 3
Path Analyses with Structural and Behavioral Features of the Local Friendship Network Predicting Aggression

	Concurrent	Longitudinal
Covariates		
Gender	.11* (-.07)	.07 (.05)
Grade (Seventh)	-.24*** (-.14)	-.26*** (-.16)
Grade (Eighth)	-.12* (-.07)	-.12* (-.08)
Ethnicity (White)	-.10 (-.05)	-.11 (-.05)
Ethnicity (Black)	.14+ (.07)	.13+ (.06)
Ethnicity (Other)	-.04 (-.02)	-.04 (-.02)
Prop of Highly Aggressive Friends	-.15 (-.06)	.50*** (.21)
Variability in Friends' Aggression	-.03+ (-.11)	.03* (.10)
Aggression (Wave 2)	—	.33*** (.46)
Predictors		
Size	.03* (.07)	-.01 (-.02)
Interconnectedness	-.10 (-.03)	-.15* (-.07)
Moderator		
Friends' Average Aggression	.54*** (.44)	.07* (.08)
Interaction		
Size X Friends' Aggression	.05+ (.06)	.02 (.04)
Interconnectedness X Friends' Aggression	.03 (.01)	-.07 (-.02)
R-Square Value	.16***	.25***

Note. $N = 874$. Prop = Proportion. Unstandardized beta coefficients are shown (standardized betas in parentheses). Gender is coded as girls = 0, boys = 1. Grade (Seventh) is coded as sixth grade = 0, seventh grade = 1. Grade (Eighth) is coded as sixth grade = 0, eighth grade = 1. Ethnicity (White) is coded as Latino = 0, White = 1. Ethnicity (Black) is coded as Latino = 0, Black = 1. Ethnicity (Other) is coded as Latino = 0, other = 1. Note that in the longitudinal model, paths were specified from covariates to Wave 2 aggression.

+ $p < .08$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Means, Standard Deviations, and Correlations among Study Variables

Panel 1. Descriptives	<i>M</i>	<i>SD</i>	Range			
Individual Aggression (High Agg Partner)	1.60	.50	1.14 – 3.00			
Individual Aggression (Low Agg Partner)	1.10	.21	1.00 – 2.00			
Dyadic Discrepancy in Aggression	.49	.43	.14 – 2.00			
Collaboration	1.97	.21	1.00 – 2.12			
Peer Perceptions (High Agg Partner)	6.15	.96	2.62 – 7.00			
Peer Perceptions (Low Agg Partner)	6.07	.82	3.63 – 7.00			

Panel 2. Correlations	1	2	3	4	5	6
1. Individual Agg (High Agg Partner)	–	.51***	.90***	-.26*	-.25*	-.20
2. Individual Agg (Low Agg Partner)		–	.09	-.15	-.15	.06
3. Dyadic Discrepancy in Agg			–	-.33***	-.22	-.26*
4. Collaboration				–	.35**	.40**
5. Peer Perceptions (High Agg Partner)					–	.48***
6. Peer Perceptions (Low Agg Partner)						–

Note. Agg = Aggression. Collaboration was reflected square root transformed. Peer Perceptions of high agg partner represents how the high agg partner perceived his or her partner. Peer Perceptions of low agg partner represents how the low agg partner perceived his or her partner.

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

Table 5

Percentage of Dyads in Each Gender and Ethnic Category

	Latino	Not Latino	Latino-Not Latino	Not Latino- Latino	Total
Girl-Girl	7%	11%	6%	6%	30%
Boy-Boy	8%	11%	9%	7%	35%
Boy-Girl	4%	7%	5%	4%	20%
Girl-Boy	2%	6%	3%	4%	15%
Total	21%	35%	23%	21%	100%

Note. Latino-Not Latino = aggressor is Latino, victim is not Latino. Not Latino-Latino = aggressor is not Latino, victim is Latino.

APPENDIX B

FIGURES 1-4

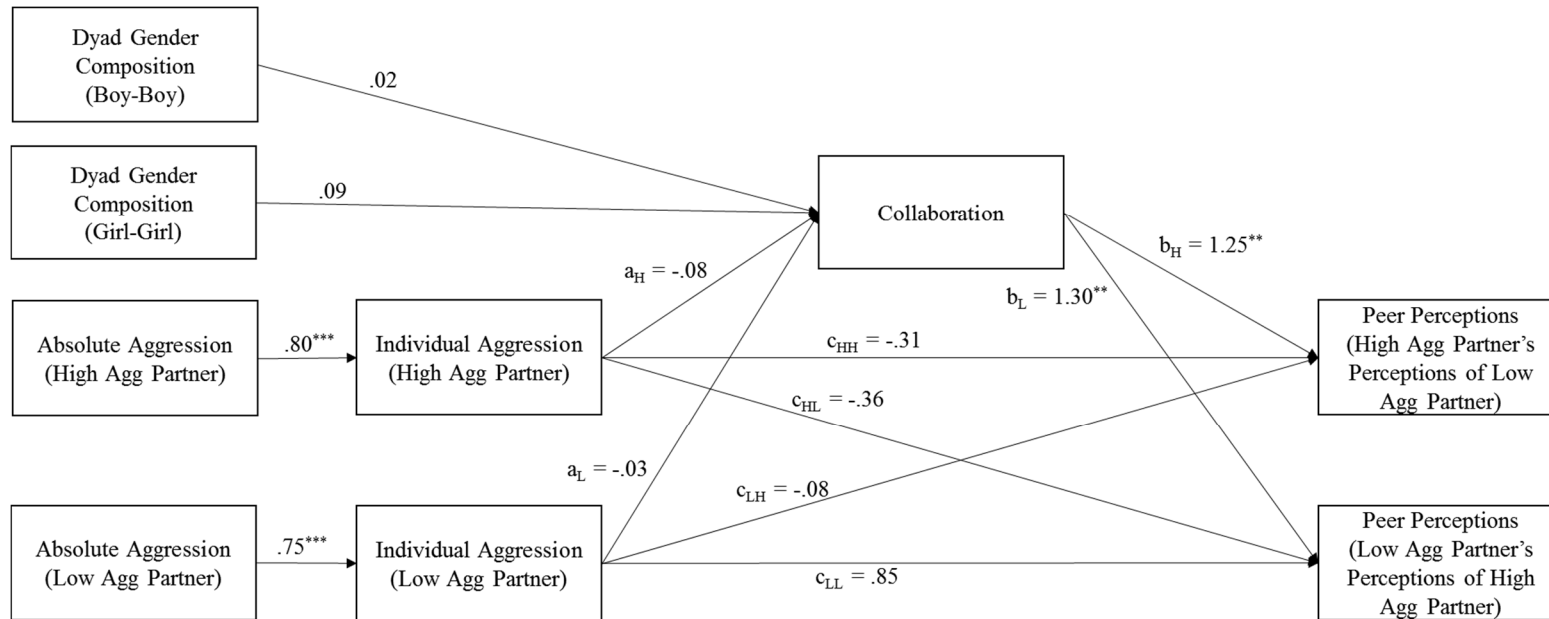


Figure 1. Mediation model from each dyad members' Individual Aggression to Peers' Perceptions of one another through Collaboration, controlling for each dyad members' Absolute Aggression. Control variables were allowed to correlate with one another (not shown in model). H indicates high aggression partner. L indicates low aggression partner.
 $^{**}p < .01$. $^{***}p < .001$.

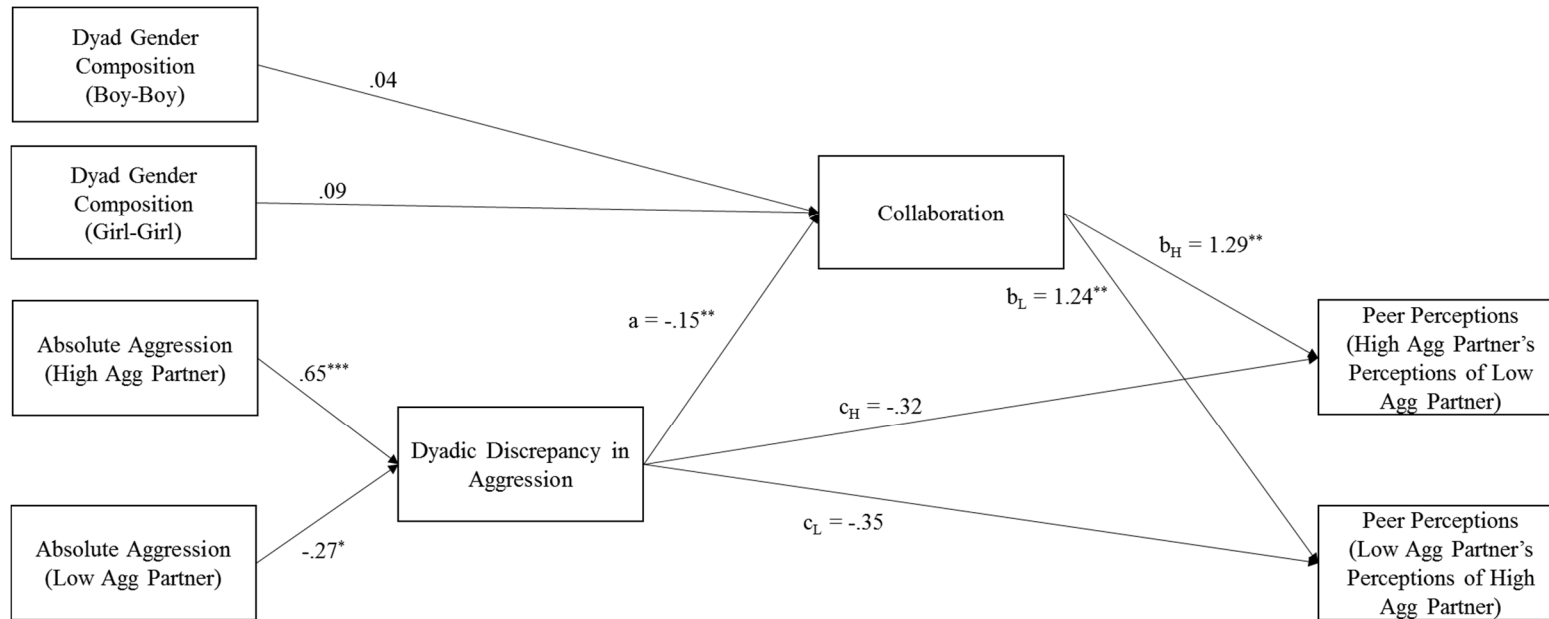


Figure 2. Mediation model from Dyadic Discrepancy in Aggression to Peers' Perceptions of one another through Collaboration, controlling for each dyad members' Absolute Aggression. Control variables were allowed to correlate with one another (not shown in model). H indicates high aggression partner. L indicates low aggression partner.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

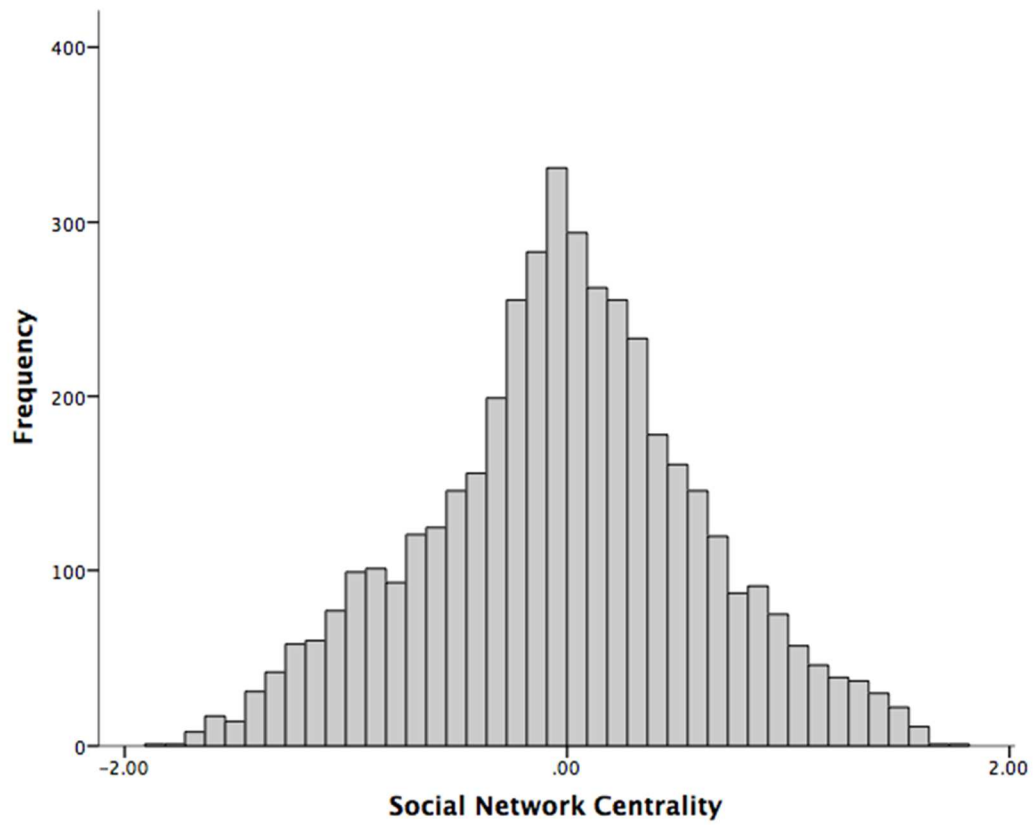


Figure 3. Histogram showing distribution of social network centrality.

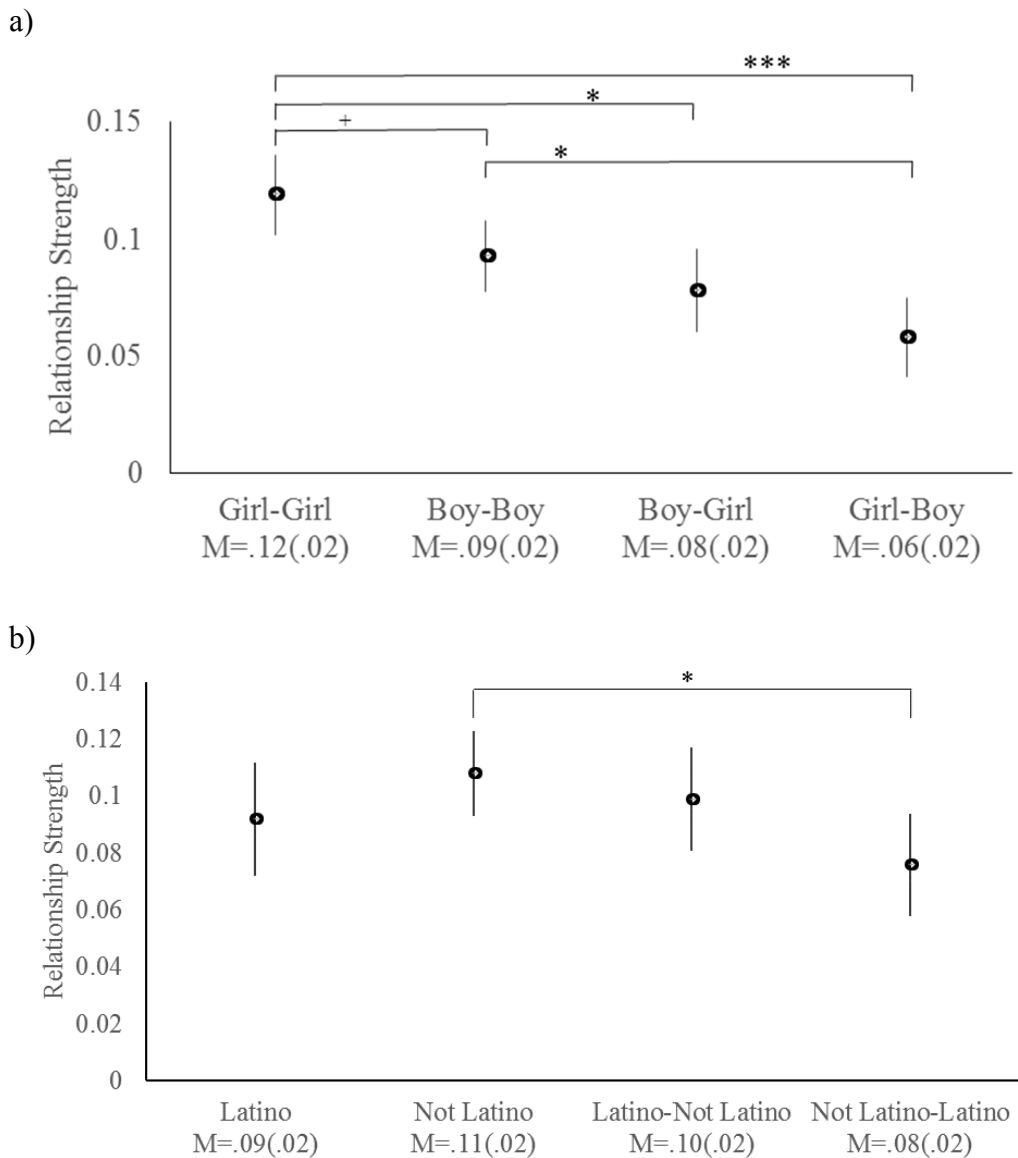


Figure 4. Plots of adjusted means (and standard errors) of relationship strength for aggressor-victim dyads classified based on a) gender and b) ethnicity. Solid dots represent adjusted means and extending lines represent 1 standard error above and below the mean. Brackets indicate significant mean differences between groups.
⁺ $p = .07$, * $p < .05$, ** $p < .01$, *** $p < .001$