Conflict and Harmony during Interaction of Preschool Children:
Influences of Relationship Status of Dyads

by

Mina Kim

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
August 9, 2010

Keywords: preschool, conflict, harmony,
friendship, dominance, dyad

Approved by

Brian E. Vaughn, Chair, Professor of Human Development and Family Studies
Margaret K. Keiley, Professor of Human Development and Family Studies
Jacquelyn Mize, Professor of Human Development and Family Studies
Alexander T. Vazsonyi, Professor of Human Development and Family Studies

ABSTRACT

The aim of this study was to investigate the effects of friendship and dominance status on interaction quality—harmony and conflict during play—among preschool-aged children. The study considered the effects of friendship and dominance on the degree of conflict and harmony in dyadic interactions. Behavioral traits (i.e., outside dyad general interaction tendency), demographic factors (i.e., age and sex composition), and socio-emotional characteristics (i.e., affect expressiveness and social competence) of dyads were included in the analysis to control for their potential impact on dyadic-level variance. The methods included direct observation of social interaction, interviews with children, and ratings of friendship and dominance by teachers. Participants were 385 children (36- to 60-months of age; 1784 dyads). Demographic and relational characteristics of dyads were associated with the frequency and intensity of interaction qualities as main effects and but not as interaction effects: (1) older children engaged in more frequent but less intense conflicted interaction and more frequent harmonious interaction than younger children; (2) girl-girl dyads engaged in more frequent harmonious interaction and boy-boy dyads engaged in more frequent and more intense conflicted interaction; (3) established friendship (as noted by two teachers) was associated with more frequent conflict and more intense harmony than a friendship noted by only one teacher or a lack of friendship in a dyad; (4) dyads with established paired dominance engaged in less frequent harmony and more intense conflict than dyads of equals. Relationship status variables predicted interaction qualities above and beyond demographic, behavioral, and socio-emotional characteristics of dyads individually

such that (1) friendship made a unique contribution to the frequency of harmony and (2)

dominance made a unique contribution to the intensity of conflict.

Acknowledgments

I would like to express my sincere gratitude to my advisor, Dr. Brian E. Vaughn, for his support, guidance, and patience, throughout my graduate study at Auburn. I would also like to thank each of my committee members, Drs. Margaret K. Keiley, Jacquelyn Mize, and Alexander Vazsonyi for their invaluable support, encouragement, and feedback through the process of my dissertation. I am also thankful to Dr. Frank Weathers for his feedback and encouragement.

I would like to express my deepest gratitude to my friends, Drs. Li Huang, Dilbur Arsiwalla, Nana Shin, Pan Chen, and Tianyi Yu for sharing their knowledge of research through continuous discussion as well as emotional support when it was needed the most.

Finally, I am grateful to my family—my husband, Dr. Jong Wook Hong, who has been a constant source of inspiration in my life and whose wisdom, knowledge, and love have taught me some of the deepest lessons of life; my dearest children, Annette and Stephen for their love, patience, and support; my ever-loving parents: my mother, Haeng-Ja Moon, and my father, Yong-Ho Kim, for their unconditional love, encouragement, and support in all my endeavors and aspirations; and my respecting mother-in law, Soon-Nam Cho, for encouragement and support. This Dissertation would not have seen the light of the day without their constant faith and unconditional support.

Table of Contents

List of Tables

List of Figures

INTRODUCTION

Developmental scientists are interested in the interactions and relationships of young children because these social contexts serve as arenas for the acquisition and practice of a range of skills associated with various social roles. Peers can serve as initiators, mediators, judges, reactors, and models in interactions, thereby co-constructing contexts that support the child's social and emotional development. Interactions among peers also serve as the basis for the formation of distinct social relationships (e.g., friendships), which, in turn, modulate and direct the nature of interactions occurring between members of a relationship dyad (see Asendorf & van Aken, 1994; Ross, Conant, Cheyne, & Alevisos, 1992; Rubin, 1999). Relationship attributes (that is, whether a dyad can be considered friends and as having dominant and subordinate partners) interact with the individual characteristics of the dyad members (e.g., age, sex, level of social competence) in play to yield changes in the characteristic modes/qualities of dyadic interactions (Rubin, 1999). This acknowledgement of the bi-directional influences of interactions and relationships is an advance in the conceptualization of the process of social/emotional development, but it also necessarily increases the complexity of analytic designs. Indeed, it remains to be seen whether and how much relationship status (e.g., friendship, dominance) contributes to dyadic behavior over and above demographic status (e.g., age, sex) and individual level behavioral traits (e.g., social competence).

Relationship status has been conceptualized and assessed in different ways based on the interests of researchers in terms of either horizontal (e.g., friendship) or vertical (e.g., dominance) relationship types, and relatively little effort has been expended on examination of both dimensions simultaneously. Given knowledge of the quality of

1

interaction and its association with endogenous and exogenous factors, it will be interesting to investigate whether and how each of these factors determines interaction quality.

Interaction has been defined and assessed in qualitatively different ways, depending on the interests of researchers. Some interactions with peers are viewed as having a positive (i.e., harmonious) tone, others as having a negative (i.e., conflicted) tone. Harmony and conflict are often regarded as incompatible (or perhaps mutually exclusive) descriptors for interactions and relationships that reside at opposite ends of a continuum of interaction quality. However, treating these qualities as mutually exclusive obscures the fact that most interactive episodes and dyadic relationships are never completely harmonious or conflicted, rather both qualities are present to varying degrees and both may serve the shorter- and longer-term adaptive needs of the individuals and the dyadic relationship (e.g., Turiel, 2004). One goal of the present study is to consider this alternative perspective as it relates to the dyadic interactions of preschool children. Finding meaningful relations between descriptors for interactions and relationship status variables could show that conflict and harmony, while mutually exclusive at a given moment of observation, are present and meaningful in ongoing transactions and the relationships those transactions reflect.

As Hinde and Stevenson-Hinde (1976) point out, both interactions and relationships are described by the patterning of qualities such as harmony or conflict. These "patterns" of exchange can differ along several dimensions including both the frequency of a given quality (e.g., harmony) and the intensity of such (harmonious) events. For the purposes of the present study, evaluations of both frequency (i.e., number

of events indicative of harmony or conflict) and the level of intensity (i.e., low, intermediate, high, very high) of each event were used.

Children's social development has been found to vary across individuals; thus, most research has included the demographic (e.g., age, sex), behavioral (e.g., trait-like or general behavioral tendency), and socio-emotional characteristics (e.g., social competence, affect expressiveness) of individual children in its investigation of social behaviors as related outcomes (see Rubin, Bukowski, & Parker, 2006). However, there has been little attempt to characterize dyads in the same way that individuals were described (i.e., by age group, sex composition, dyadic behavioral characteristics, dyadic social competence level, dyadic affect expressiveness level) and to include these individual variables in combination with demographic status and relationship status levels. Thus, dyadic data of the type used in this study were described in the same way that individuals were characterized in general. For example, unique dyad member's behavioral characteristics were calculated from the dyadic conflict and harmony scores, based on each child's interactions with all other partners. These "out-dyad" scores are an average of the two partners' mean dyadic conflict and harmony scores with all other partners. "In-dyad" scores are the average conflict and harmony scores for a given pair of children.

Given that the acquisition of positive and socially acceptable ways of interaction occur within the context of peer groups, and that dyadic peer interactions make a substantial contribution to children's social and emotional development in the early childhood years, it is surprising that most reports regarding peer interaction and relationships treat the individual child, rather than the dyad, as the unit of analysis. Thus,

employing dyadic level attributes as analysis components will offer a new vision in the investigation of the association between peer relationships and interaction qualities, potentially expanding or improving our understanding of child development above and beyond individual level characteristics.

Most developmental scientists accept that harmony and conflict in the context of interactions are determined by unique attributes of the dyad as well as by unique attributes of each dyad member. However, individual data and dyadic data give different sorts of information; thus, it can be expected that explanations of variance in interaction qualities by individual and dyadic data also should be different. Dyadic level descriptors offer dyad-unique information for a given dyad (e.g., the fact that members of a given dyad are "friends" does not imply that both children will be "friends" with non-dyad peers in the classroom). Individual data, on the other hand (e.g., age, sex) will transcend the dyad for each member. Friendship, dominance, and the patterning of interactions in this study are unique to each given dyad and dyadic data rather than individual data are the objects for analysis in this study.

Since children in the dyads were from the same classroom, it is possible that the data have a nested structure. That is, children who share the same teachers and classmates may have related or dependent scores. In order to authenticate the data structure of the study, the assumption of data independence was tested. If the dyadic observation scores nested within classrooms were independent from the classroom scores and from the individual scores within a dyad, the dyadic data structure was justified for use without controlling for classroom effects on interaction qualities. Finding impacts on either (or both) individuals by classroom scores or individual scores within a dyad would violate

the assumption of data independence and require controlling for these effects in subsequent analyses.

This study tests whether and how much relationship statuses (i.e., friendship and dominance) explains harmony and conflict in dyadic interactions controlling for trait-like behavioral characteristics (i.e., out-dyad general interaction tendency), demographic factors (i.e., age and sex composition of the dyad), and socio-emotional characteristics (i.e., affect expressiveness and social competence in dyadic interactions), by employing direct observation of dyads and individuals, interviews with children, and evaluations by teachers.

LITERATURE REVIEW

Interaction Qualities: Conflict and Harmony

Peer interactions afford opportunities to be exposed to conflicting ideas and explanations, to negotiate and discuss multiple perspectives, and to decide to compromise with or reject the notions held by peers (Rubin et al., 2006). These peer transactions may serve to promote positive and adaptive developmental outcomes for children, such as the ability to understand others' thoughts, emotions, and intentions.

The cognitive developmental perspective supports two compatible propositions on conflict and harmony in peer interaction. Piagetians believe that peer conflict evokes change and thus spurs development, whereas Vygotskians contend that cooperation promotes change (Rubin et al., 2006). From a Piagetian perspective, developmental change occurs because differences of opinion provoke cognitive disequilibria that are sufficiently discomforting as to elicit attempts at resolution (Piaget, 1985). Each interaction partner must construct, or reconstruct, a coordinated perspective of the original set of ideas to reinstate a sense of cognitive equilibrium, as described in the work of Piagetian researchers (see Doise & Mugny, 1984; Doise, Mugny, & Perez, 1998).

On the other hand, according to Vygotsky (1978), cognitive growth and development are a function of interpersonal exchange. From this perspective, conflicting ideas and differences actually elicit cooperation between partners or expose children to opportunities to take others' perspective. Researchers such as Azmitia (Azmitia, Lippman, & Ittel, 1999), Tudge (Hogan & Tudge, 1999) and Rogoff (1997) have argued that the child's peers can play the role of co-constructivist; thus, conflict promotes

cognitive and emotional growth because partners move forward by learning or experiencing negotiation and compromise.

Recent views center the role of conflict on the disagreements between peers about personal, interpersonal, and impersonal matters (e.g., Laursen et al., 2001; Shulman & Laursen, 2002). Interpersonal conflict is inevitable because it is very often, if not always, the case that what is in the best interests of one interaction partner is not in the best interests of the other. Somebody "wins" in nearly every conflict of interest. Even when compromise occurs, it is rare that a perfectly equitable solution is reached, and someone must give up some interests to get others. It is worth noting that toddlers' social interaction is marked by conflict (e.g., Hay, Castle, & Davies, 2000; Rubin, Hastings, Chen, Stewart, & McNichol, 1998). It appears that conflict is neither infrequent nor limited to a small percentage of toddlers, and toddlers who frequently instigate conflicts with peers are often the most socially outgoing and initiating (NICHD, 2001; Rubin et al., 1998). Aggressive behavior in preschoolers has been associated with several measures of social competence (i.e., received visual attention, Q-sort ratings, and visual regard; Bost et al., 1998).

Not only is conflict ubiquitous, it may also be constructive. Conflict typically is considered to have destructive effects on social interactions. Especially in developmental psychology, conflicted interaction has been considered to reflect a lack of harmony (see Swierczek & Onishi, 2003) or deficient social information processing skills (e.g., Dodge, 1986). From the perspective of the present study, however, characterizing conflict and harmony as a mutually exclusive dichotomy is misleading because it is possible to have both high conflict and high harmony in a single bout of social interaction in which

7

conflicts are followed by resolutions. Moreover, conflicts can play an important role in getting to know other people (Shantz, 1987) and can provide an opportunity for children to demonstrate and learn a variety of discourse skills (Goodwin, 1987).

Understanding the nature of the conflict is critical to whether one sees it as a positive or negative element in development. Some conflict seems to have a positive function in children's social cognitive development. Miller, Denaher, and Forbes (1986) frame two perspectives on conflict. The first is to see it foremost as a contest, a "competition of viewpoints," and to focus on the tactics used for persuasion and control; the second perspective considers the emotionally threatening aspects of conflict and focuses on tactics that restore interpersonal function and harmony.

More recently, researchers with an evolutionarily-oriented perspective on peer relations (e.g., Bjorklund & Pellegrini, 2000; Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Hawley, 1999, 2006; Vaughn & Santos, 2007; Vaughn, Vollenweider, Bost, Azria-Evans, & Snider, 2003) have noted the co-occurrence of agonistic behavior and affiliative behavior in children's interactions (Pellegrini, 2008).

Therefore, it is important to define what a researcher means by "conflict." When it is equated with aggressive behavior and physical harm, it goes beyond what Piaget or Vygotsky had in mind. At the same time, when conflicts of interest focus on disagreements about an idea or object and the disagreements lead to a discussion of differences, they can have constructive consequences. The majority of conflicts between peers in preschool are of the disagreement type rather than the aggression/physical harm type.

Interaction Qualities and Demographic Characteristics

Interaction Qualities and Age. The social interactions of older preschoolers involve longer sequences or turns. With increasing age, play partners were better able to agree with each other about the roles, rules, and themes in their pretend play. They were also better able to maintain play interactions by adding new dimensions to their expressed ideas. Several studies have focused on individual differences in interaction among peers differentiated by age level. For example, a higher proportion of "distribution of resource" conflicts are seen among two-year-olds than among 3- and 4-year-olds (Chen, Fein, & Tam, 2001). Conflicts about play and ideas significantly increased with age, but those stemming from physical harm were lower overall for the older children. Further, child-generated resolutions increased, while insistence decreased significantly with age. Developmental changes occur in the issues causing conflict and the way the conflicts are handled, not the incidence of conflict *per se.*

Interaction Qualities and Sex. Interaction quality varies depending on gender of children. Preschool girls have more nonaggressive conflicts than preschool boys do (Shantz & Schomer, 1977), fighting more often over issues of personal control than boys do, whereas boys fight more over objects than girls do. Boys tend to vent interpersonal anger more than girls, whereas girls tend to actively assert themselves more than boys in peer groups (Fabes, Martin, & Hanish, 2004). Furthermore, it seems that physical or aggressive resolutions are more acceptable to boys than to girls. Preschool boys have twice as many engagements in conflicts as girls have (Lu, 1998). A study concerning sex differences in interaction among children in early childhood centers (Smith & Inder, 1993) reported that mixed gender groups used male-preferred themes and boisterous play

almost as much as male groups, but rarely used female-preferred themes. Among kindergarteners, researchers observe more physical conflict and rejection in mixed groups than in boys' groups and observe none in girls' groups (Smith & Inder, 1993). Since interaction qualities are influenced by the age and sex composition of dyads/groups, researchers need age-appropriate and gender-free assessment tools, multiple opportunities to assess the dyad with different task/toys, or controls or adjustments for age and sex difference prior to analyses.

Interaction Qualities and Relationship Statuses: Friendship

Social relationships, including friendships and social dominance, have emerged as important aspects of social development for children in middle childhood. However, little is known about early childhood relationship statuses and their potential impact on the ways children interact with peers, although children establish their first friendships in the preschool years (Charlesworth & La Freniere, 1983).

Friendship. One outcome of successful socialization for young children is the creation of positive relationships with others. Friendship is an outcome positive interactions, and it flourishes in early childhood. Friendship in general is characterized by a dyadic relationship of reciprocity and interdependence for both partners. However, friendship for young children often means simply that children play together (see Berndt & McCandless, 2009). Children in friendships are more responsive and willing to exercise self-control as well as to show warmth to their friends. Friendships are characterized as special dyadic, social relationships that serve a variety of functions. Friendships offer the opportunity to acquire social skills, serve as a basis for social comparison and self-processing, and promote a feeling of group belonging (Rubin, 1980).

Using parents' reports on friendship, an investigation followed preschool friends over a substantial period of time and found that most remained friends for at least seven months and that some continued for as long as eighteen months (Park & Waters, 1989). Other researchers report that nearly two-thirds of a sample of preschool friends sustained these relationships across a school year (Gershman & Hayes, 1983). Preschoolers' play with friends is typically more coordinated and interdependent than was their play with non-friends (Parker & Gottman, 1989).

Friendship and Age. With regard to developmental changes, children's peer relationships have been described as evolving on a variety of levels—from the intrapersonal to the interpersonal, in both dyads and groups (Rubin, Bukowski, & Parker, 1998). For example, older children spend more time with peers (Feiring & Lewis, 1989) and attribute more importance to peer relationships than do younger children (Berndt, 1981; Berndt & Hoyle, 1985; Buhrmester & Furman, 1987; Pitcher & Schultz, 1983). Older children's friendships also tend to be more stable (Berndt, 1981; Berndt & Hoyle, 1985), and, at least among girls, more intimate than younger children's relationships (Buhrmester & Furman, 1987).

Furthermore, children's conceptions of friendship evolve to focus more on affective, motivational, and prosocial intentions and less on external characteristics (Furman & Bierman, 1983). Thus, with age and cognitive maturation, children's friendships become more delineated and stable, and conceptions of friendship become more sophisticated. Children's friendships additionally tend to become more central, more exclusive, and less transient with age. The social interactions of older preschoolers involve longer sequences or turns. With increasing age, play partners were better able to

11

agree with each other about the roles, rules, and themes in their pretend play. They were also better able to maintain play interactions by adding new dimensions to their expressed ideas. For example, Goncu (1993) found quantitative differences in the extent to which the social interchanges of 3- versus 4 1/2 –year-olds reflect shared meanings.

Friendship and Sex. Children prefer friends of the same sex (e.g., Belle, 1989; Feiring & Lewis, 1987; Pitcher & Schultz, 1983). This phenomenon has been observed in children as young as 33 months (Jacklin & Maccoby, 1978), and appears to increase in intensity with age until middle childhood (Belle, 1989; Benenson, Apostoleris, & Parnass, 1998; Maccoby, 1988, 1990). This same-sex friendship preference is a robust phenomenon, observed across children's interactions (e.g., Boyatzis, Mallis, & Leon, 1999; La Freniere, Strayer, & Gauthier, 1984), their nominations of friends (e.g., Graham, Cohen, Zbikowski, & Secrist, 1998), and their sociometric ratings of peers (Lockheed, 1986). Graham et al. (1998) investigated the gender difference in friendship, and both group and individual change analyses with longitudinal data indicated that the children's proportion of same-sex mutual friendships increased with age. Boys, but not girls, increased in their proportion of same-sex mutual friends as they got older. The researchers concluded that sex appeared to be a salient consideration in friendship choices.

Other findings indicated that boys were more likely than girls to smile and laugh with their friends when they were engaged in close social encounters (Foot, Chapman, & Smith, 1977). Boys are less likely to share with their friends when they can lose the competition and risk appearing inferior in comparison to their friends. However, this finding is countered by the finding that children of both sexes avoid directly competing

and comparing themselves to their friends by choosing to engage in a different task (Ladd, 2005). Friends, as compared to non-friends, were typically assigned higher ratings for positive features of interaction and lower ratings for negative features (Berndt & Perry, 1986); however, sometimes friendships among school-aged children are imbalanced or create discrepant roles, such as when one friend attempts to dominate the other (Youniss, 1980).

In addition, early peer friendships have been found to differ considerably between girls and boys and across age groups. Friends serve a necessary function for all preschoolers, though girls value dyadic relationships more than boys, as such relationships provide intimacy and closeness (Agnor, 2009). For example, girls' friendships and social networks tend to be smaller in size than boys (Belle, 1989; Benenson, 1990, 1993; Berndt & Hoyle, 1985; Lever, 1976; Waldrop & Halverson, 1975). Girls' friendship during middle childhood tends to be more intimate than boys' friendships and social networks (Belle, 1989; Furman & Buhrmester, 1985; Lansford & Parker, 1999; Pitcher & Schultz, 1983). Male friends have been found to prefer to play outdoors, to play longer, to play more competitive games, and to have more age-heterogeneous groups than female friends (Lever, 1976).

Friendship and Interaction Qualities. Ethological research suggests meaningful correlations between friendship status and interaction quality in children. In several studies including human and nonhuman primate samples, the friendship status (i.e., friends vs. non-friends) as well as sex of playmates affects peaceful interaction (see Verbeek & de Waal, 2001). In studies of peer relations in middle childhood, children spend more time interacting with friends than non-friends (Hartup, 1989), and their

interactions with their friends differ from those with non-friends. In a preschool peer relations study, friends engaged in higher levels of social interaction and exhibited more sophisticated forms of play (Doyle, Connolly, & Rivest, 1980) as well as more affectionate and communicative behaviors with each other than with non-friends.

Friends also are more socially engaged than non-friends during interactions and makde more references to equity and reciprocity; affective exchanges are more extensive between friends than between non-friends among 3rd graders (Newcomb, Brady, & Hartup, 1979). Furthermore, during middle childhood, nonaggressive conflict is notable especially among girls, and nonaggressive conflict does not block friendships. Additionally, in middle childhood, mutual friends have more conflict than non-friends (Green, 1933). Other studies on the connection between friendship and conflict have demonstrated that friends are more committed to resolving conflict with each other and are more likely to reach equitable resolutions and continue to interact following a disagreement than non-friends are (Laursen, 1993; Laursen, Finkelstein, & Betts, 2001; Laursen, Hartup, & Koplas, 1996; Newcomb &Bagwell, 1995). Conflict in friendships is reported more often by boys than by girls (Furman & Adler, 1982). Considering such differences, it seems reasonable to ask whether there are statistical interactions among demographic factors and relationship quality factors as these relate to interaction quality.

In sum, there are gender- and age-related patterns of friendship in terms of the formation and features of friendship. Older preschool children tend to have more interaction with friends, more stable and inclusive friendships, and more same-sex friends than younger children. Friends, in general, engage in less conflicted interaction

and experience more harmonious interactions than non-friends, since they are better able to agree with each other and tend to avoid situations that will elicit conflict.

Interaction Qualities and Relationship Statuses: Dominance

Dominance. Peer relationships can be portrayed in terms of a vertical plane of dominance and power assertion at one end and submission at the other end. The relationships that result from the emergence of social status among early peer groups are the basis of dominance hierarchies. Hierarchical status relationships can be inferred from the directed agonism of children (Strayer & Strayer, 1976; Vaughn & Santos, 2007). A cross-sectional study by Strayer and Trudel (1984) found directed agonism in children as young as 15- to 18 months, and nearly 75% of peer dyads in toddler classrooms engaged in agonistic exchanges with distinct roles of attack or submission. Hierarchical status can remain stable during the preschool years for at least as long as nine months (La Freniere & Charlesworth, 1983; Strayer & Trudel, 1984). Moreover, the positions of dominance and submission that are described for each child correspond with later developmental outcomes and social experiences (Asher & Rose, 1997; Coie, Dodge, & Kupersmidt, 1990; Putallaz & Wasserman, 1990; Rubin, Bukowski & Parker, 1998). High status within dominance hierarchies predicts the acquisition of desired resources such as attention, toys and assumption of leadership roles during peer play (Camras, 1984; Charlesworth & La Freniere, 1983; Strayer, 1981). Social dominance can be construed as the manifestation of asymmetries in children's ability and desire to wield social power (Hawley & Little, 1999).

Two conceptual orientations apply to the emergence of social dominance among children. One position views dominance as an outcome of a relationship (Dovidio &

15

Ellyson, 1985). From this perspective, dominance develops from social interaction between two partners, rather than from qualities residing within an individual. In contrast, according to the social relations approach to dominance, dominance derives from qualities of the individuals involved in that peer interaction (Hawley & Little, 1999). From this perspective, children with higher dominance ranks in their groups bring different behavioral traits and motivations to relationships that become structurally defined. Hawley and Little (1999) suggest that variables at the individual level of analysis serve as stronger predictors of dominance than do variables describing relationships or the structure of the entire peer group. They studied toddlers across a broad developmental age range and found that older and bigger toddlers were dominant. Vaughn and Santos (2007), however, argue that the prediction of dominance by individual characteristics such as size and development is useful only when groups have an age-range large enough for size and development to matter.

In addition, dyadic dominance relations are qualitatively different from dominance hierarchies since dyadic relations describe the relative balance of social power between specific members, rather than power relations among all members of the group (Strayer, 1976). The assumption that interactive behavior among preschool children differs depending on context-specific (i.e., dyadic characteristics) and context-general (i.e., individual characteristics) factors requires researchers to include not only individual-level but also dyad-level characteristics in investigation. However, few child development studies have examined dominance at the level of the dyad and included measures that differentiate established dominance (i.e., one child is dominant to the other in a dyad most of the time) from equality (i.e., neither child dominates the other most of

16

the time). In addition to the knowledge that dominance in developmental psychology

requires dyadic assessment since dominance in relationship among preschool children

describes the relative power relation rather than the general power rank among all

members of the group, there is a practicability issue in dominance measurement. Since

behavioral display relevant to dominance that were infrequently observed in preschools,

especially in university lab preschools (Hartup, 1983), teachers' judgment has been

widely used and accepted (e.g., Achenbach, McConaughy, & Howell, 1987; Hawley,

2002; National Institute of Child Health and Human Development Early Child Care

Research Network, 2005).

Dominance and Age. An ethological perspective on social dominance implies that

a child's dominance status reflects his/her relative competitive ability in the peer group.

Teachers' judgment of dominance reported an agonistic exchange (i.e. behaviors related

to dominance interactions) among toddlers (Hawley and Little, 1999). Interestingly, the

percentage of observed dominance during toddlerhood declined to 55% for 3-year-olds

and 45 % for 5-year-olds, whereas the rigidity and stability of hierarchies increased as

children grew (e.g., Strayer, 1989). Based on these findings, age does not predict

dominance status in children as much as the shape of the dominance hierarchy and the

fact that children seem to acquire information about their own positions in the hierarchy

by observation of others (not by actually contesting with the others). Another study on

social dominance and age (Vaughn et al., 2003) reports that older children who are

characterized as socially dominant were more socially engaged and involved in activities

considered less socially desirable behavior as a result of their higher levels of social

engagement. This suggests that social dominance is associated with higher levels of

conflicted interaction with peers; however, this individual level dominance does not necessarily indicate whether a dominant child will be dominant to another peer in a dyadic interaction because that peer's characteristics will influence the relationship as well.

Dominance and Sex. Traditional approaches to social dominance (i.e., examination of directed agonism in the group) have included the assumption that gender is a factor in establishing social dominance structures. However, research on dominance relations among preschool children has shown that position in the dominance hierarchy was not directly related to gender (Strayer & Strayer, 1976). Hawley (2002) found that age, parent-rated openness to experience, and parent-rated extroversion were significantly correlated with dominance status in the day care context, and independently of the effects of age, gender was not a significant contributor to dominance, nor was size of a child.

Dominance and Interaction Qualities. Dominant children have been found to possess cooperative and prosocial strategies that are combined with overtly competitive strategies to a greater extent than in submissive children (Hawley, 1999a). Furthermore, a child's behavioral approach to securing dominance broadens to include such social skills as reciprocity, ingratiation, bargaining and compromise, appeals to friendship obligations, and even manipulation or deception (Hawley, 1999a; Keating & Heltman, 1994). Although it is not clear whether traits supporting cooperative/prosocial interaction mixed with coercive/aggressive strategies for goal achievement make an individual dominant, or if becoming dominant leads to these different strategic behavioral plans, during the preschool years dominance seems usually to be achieved via physical coercion of peers (Boulton & Smith, 1990; Hold-Cavall & Borsutsky, 1986; Rubin, et al., 1998; Williams

& Schaller, 1993). However, another study found that the most aggressive children are rarely the most socially dominant (Vaughn & Santos, 2007).

Although aggression is not equivalent to social dominance, aggression has been repeatedly assessed as an important component in the exploration of social dominance of children. Children who maintain high statuses within a dominance ranking act aggressively to meet social goals (Strayer & Trudel, 1984). Aggression may be an tolerated tactic among during the preschool period because it is associated with activity, extroversion, and willfulness. Since preschoolers have fewer resources than older children to mount an effective alternative strategy (and are limited to hitting back or complaining to an adult), when they are confronted by aggressive tactics from peers, they do not reject coercive strategies (Hawley, 2003).

In sum, dominance status is shown at a very young age and its rigidity and stability increase with age. However, there is no gender effect in the prediction of social dominance. Dominance status in children has been assessed in different ways, such as by having teachers evaluate dominance among children in groups or in paired comparisons or by researchers' direct observation of children. Given the knowledge that observation of dyadic dominance offers different information about dyad power relation from classroom ranking and that the external correlates of dominance at the individual level are clear (Hawley, 1999a), the employment of teacher judgments on paired dominance was justified in the current research.

Joint Influence of Friendship and Dominance on Interaction. Peers reward or reinforce behaviors that are appropriate and competent, and at the same time they punish or ignore incompetent or non-normative social behavior resulting in conflict. Meanwhile,

the child's performance in group interaction varies greatly and may be influenced by dominance and friendship relationships within the larger peer group. Dominance rank has been significantly and positively related to cooperative behavior, and friendship has been shown to moderate the effects of dominance on behaviors such that when a dominant child was interacting with friends, he or she tends to share resources more than when with non-friends (Charlesworth & La Freniere, 1983). However, not all high ranked children yield to others. Neither do they help peers to achieve their goals.

The latter findings suggest a complicated influence of relationship status on interaction qualities of children and a complex interaction between dominance and friendship status in children's conflicted and harmonious interactions. The question of how to assess the interaction of dominance with other aspects of social behavior in children remains. Thus, an interest in the association between dominance and interaction qualities requires considering dyadic level dominance as well as individual-in-group level dominance, since the effects of dominance might be moderated by the other aspects of the child's relationship with a specific partner.

In sum, interaction qualities may differ depending on with whom one interacts. Dyads identified as friends are expected to have more conflict but also more resolution (i.e., high frequency but low intensity of conflict and high frequency and intensity of harmony), and male friends may engage in more conflicted interaction than female friends. For preschool-aged children, dyads with established dominance are expected to have less conflicted interaction than equal-powered dyads and older children. Moreover, a moderating effect of friendship, observed in the association between friendship and

cooperative behavior, suggests a complex interaction effect between the dominance and friendship status of a dyad that explains interaction qualities.

Interaction Qualities and Socio-Emotional Characteristics

Social Competence. Other correlates or qualifiers of differences in interaction are socio-emotional characteristics (e.g., affect expression and social competence) of children. Contemporary scholars in developmental psychology support the idea that cooperation is a hallmark of social competence and an element of the harmonious interaction that binds individuals in groups (e.g., Dodge, 1986; Waters & Sroufe, 1983). A definition of social competence as effectiveness or success in the attainment of one's own social goals (e.g., Attili, 1990; Duck, 1989; Rose-Krasnor, 1997; Waters & Sroufe, 1983; White, 1959) while not impeding peers' opportunities (too much) to attain their own social goals implies that a child's social competence is a critical element in determining the quality of his/her interaction with a peer. A number of researchers have shown that children who enter kindergarten exhibiting high levels of social competence have a successful early social and emotional adjustment to school (Birch, Ladd & Blecher-Sass, 1997; Ladd, Birch, & Buhs, 1999; Ladd, Kochenderfer, & Coleman, 1996). More socially competent children were reported to have more positive moods, to be accepted by peers, to be more adaptable to perturbations in the physical and social environment, more socially engaged, and to use more advanced social cognitive skills than less socially competent children (Vaughn, Shin, Kim, Coppola, Krzysik, Santos, Pecequina, Daniel, Verissimo, DeVries, Elphick, Ballentina, Bost, Newell, Miller, Snider, & Korth, 2009). Older children have higher levels of social competence (see

Akers, 2007; Shin, Vaughn, Kim, Krzysik, Santos, Pecequina, Bost, McBride, &

Coppola, in press).

Socially competent individuals respond to others' overtures in a more agreeable

and sympathetic manner (e.g., Attili, 1990; Zahn-Waxler, Radke-Yarrow, Wagner, &

Chapman, 1992) than their less socially competent peers. Such results suggest a positive

association between social competence and harmonious interaction. Socially competent

children cope with anger in ways that are relatively direct and active and in ways that

minimized further conflict and damage to social relationships (Fabes, Martin, and Hanish,

2004). However, while social competence should support relationship construction, it is

not equivalent to relationship *quality*. Socially competent children are able to achieve

personal goals in social situations while simultaneously maintaining positive

relationships (Rubin & Rose-Krasnor, 1992). Likewise, socially competent children may

differentiate their behavior in interaction with peers depending on with whom they

interact. For example, even when a target child has high social competence and meets a

highly competent playmate, if the target child dislikes the playmate, the interaction

quality can be poor.

In sum, social competence can contribute to the making of harmonious

relationships, and relationships also can enhance an individual's social competence. They

can be mutually influencing. Gender differences in social competence are observed in

that younger preschool boys are less socially competent than their female peers and less

competent than older preschool children (Vaughn et al., 2009). The proposition that

aggressive behavior is a characteristic of socially competent preschool children (Hawley,

2007) needs to be investigated in order to determine whether higher levels of aggressive

behavior are related to higher social dominance rank and whether higher levels of aggression reflect the increased salience of dominance as children get older.

Affect Expressiveness. An understanding of affect expressiveness and social interaction is described in previous theoretical and empirical work. Most theoretical perspectives on affect, as well as a number of relevant theoretical models in related areas, attempt to explain how various cognitive and motivational processes account for differences in individual affect expression (Eisenberg & Fabes, 1990; Hoffman, 1984; Strayer, 1993). Further, several scholars (see Denham, Blair, DeMulder, Levitas, Sawyer, Auerbach-Major, & Queenan, 2003; Waters, Wippman, & Sroufe, 1979; Shin, Vaughn, Kim, Kryzsik, Bost, McBride, Santos, Peceguia, & Coppola, in press) assign a causal role to affect expressiveness in the socialization process (e.g., initiating, maintaining, or terminating play with peers).

During the preschool period, children become increasingly aware of the communicative meanings of basic and complex emotional signals from themselves and others (e.g., shame, guilt, and pride) (Denham, 1998; Saarni, 1999), and children who exhibit fewer negative affect expressions in conflict situations are better liked by peers and more likely to use constructive coping techniques during conflicts (Eisenberg et al., 1994; Fabes & Eisenberg, 1992; Shin et al., in press). Other research also suggests that children who express negative emotion are lower in peer acceptance and more aggressive during interaction (Laursen & Hartup, 1989). Thus, a positive association between negative affect expressiveness in the dyad (not the child's characteristic level of negative affect) and conflicted interaction is expected. Although positive and negative affect expression are not strongly negatively related (Akers, 2007; Shin et al., in press), the

23

negative association between positive affect and conflicted or unpleasant interaction experience has been suggested and typically assessed in parent or teacher reports (see, e.g., Denham, 1986; Denham, Renwick, & Holt, 1991; Eisenberg, et al., 1997; Rydell, Berlin, & Bohlin, 2003; Sroufe et al., 1984; Strayer, 1980). Children who show relatively more joyful than angry emotions are lower in aggressiveness, respond more prosocially to peers, and are more liked by peers in the classroom than children who show more angry than joyful emotions.

Current research in affect expressiveness and social interaction suggests that the ability to express affect effectively determines whether children's strategies in their interactions with others are successful (Halberstadt, Denham, & Dunsmore, 2001). Although there have been suggestions regarding potential differences between the impacts of positive and negative affect on developmental outcomes, little effort has been given to differentiating the impact of the two different valences of affect expression on social interactions with empirical data.

In sum, older children exhibit more conflict but also more harmonious interaction following the conflict (i.e., high frequencies of both conflict and harmony in interaction) than younger children. In addition to age, gender is also a factor, with boys having more conflicted interaction than girls and mixed sex dyads. Social competence is shown to be an important factor in interaction quality. Highly socially competent children tend to have harmonious interaction with peers, but this seems to be qualified by social status factors within dyads, such as friendship and dominance. Affect expressiveness is observed to have a significant impact on peer interaction. More specifically, positive correlations

between positive affect expressiveness and harmonious interaction, and between negative affect expressiveness and conflicted interactions are expected.

Aim of the Present Study

The potential effects of friendship and dominance status, in conjunction with behavioral, demographic, and socio-emotional characteristic variables, on levels of conflicted and harmonious interaction between preschool-aged dyads will be tested. The analyses will control for the potential effect of dyadic level variance in behavioral, demographic, and socio-emotional characteristics on the interaction qualities of harmony and conflict.

METHODS

Sampling and Demographics

Participants were 385 children (36- to 60-months of age; females = 173 and males = 212) attending a university managed early education center in a large metropolitan area in the southeastern United States. This number of children yielded 1784 dyads (each child had between 3 and 15 different playmates in her/his classroom who also participated in the study). Sixty-seven percent of children were under 48 months of age at the start of the academic year. Parents were informed about the project by teachers and center directors, and they were asked to read and sign an informed consent form agreeing to their child's participation in the study as well as to complete demographic information for the child and family, such as age, gender, race, and SES indicators (i.e., occupation, income, education). Families included in this study were predominantly middle class (Vaughn et al. in press). European American families were predominant although approximately 35% of the subjects were members of ethnic minorities. Among the ethnic minority children included, the largest proportion were African American, but Asian and Indian ethnicities are also were included.

Procedures

Observations of dyadic interactions between children were collected according to a round-robin design (i.e., each child is paired with every other child in the class for a 5-minute interaction session). The goal was to observe each child playing with every other participating child in a given classroom; however, many dyads were missed due to absences from the classroom or a child's declining to play with a specific classmate. Children were invited to a laboratory space away from the classroom to play with each of

the other participating classmates for observation sessions. This way, how a child played with a variety of peers and how interaction qualities differed depending the child's relationship with a particular playmate could be observed.

Children were videotaped during 5-minute dyadic play sessions, and levels of conflicted and harmonious interaction as well as affect expression were rated from the video recording. A different toy, puzzle, or activity was used as the focus of play each time a given child was invited to play. Toys/tasks were selected to be age-appropriate, and an equal number of the available toys/tasks were stereotypically "preferred by boys" or "preferred by girls," while other toys/tasks were gender-neutral, having no obvious stereotype of gender preference. In a class of 15 children with all children participating, each child came to the lab on 14 occasions (i.e., with each of her/his classmates), and on each occasion a different toy was assigned to become the focus of activity. A research staff member brought each dyad from the classroom to the observation room. The staff member introduced the toy and explained how to operate toys and possible roles for play with the toy (e.g., fisherman and net holder for fishing hole toy). Roles were not assigned, and children were able to compete for their preferred role. The staff member stayed in the room during the play session and operated the video recorder in an adjacent room with a remote control.

Independent teams of undergraduate and graduate students were trained in videotaping children, coding tapes, conducting Q-sorts, and interviewing children. To complete the training phase, coders were required to demonstrate adequate reliability. The Kappa coefficients for inter-observer reliability were .80 or above indicating satisfactory reliabilities across the sample. The training phase for each type of coding

lasted approximately two weeks. Following successful training, coders actively engaged

in coding the videotapes and received course credit for their work. Coders assigned to

rate interaction quality (i.e., harmony and conflict) worked independently. Coders

assigned to rate affect expressiveness worked together in pairs (one coder rating child 1

in the dyad, the second rating child 2). Classroom observers (for interaction, visual

attention, and Q-sorts) worked independently, and teams responsible for one class of

assessments (e.g., Q-sorts) did not observe in a given classroom during the same time

period that the other team (e.g., visual attention/interaction) were making observations.

Two Q-sort observers and between two and six interaction/visual attention observers

were assigned to each classroom for data collection.

Teachers provided information about friendship status and dominance status for

each dyad in the classroom using prepared forms listing all possible dyads in the class.

Two teachers, working independently, identified all dyads in their classrooms that they

considered to be "close friends." The teachers also identified the socially dominant child

(see definition below) in each dyad using similar dyadic rating sheets.

Measurements

Conflict and Harmony. The coding system for rating the intensity of conflict and

harmony during dyadic interaction was developed in a preliminary study after watching

110 child dyads to create the specific descriptions of the level of intensity of conflict and

harmony separately. Fifty-five dyads were reviewed to determine the appropriate length

of an interaction interval within a 5-minute episode, and 30 seconds was considered to be

long enough to have at least one dyadic transaction. After the scale was developed, a

second graduate student coded 55 dyads to calculate inter-rater reliability, and moderate

intra-class correlations for both constructs were obtained (.72 for conflict and .72 for harmony).

Intensity Scale for Conflict and Harmony. Intensity of conflict or harmony was coded using 5-level scales. For each 30-second interval, one code on each scale was recorded. For conflict, the scale was defined as: (0) no conflict; (1) low conflict (e.g., complaining or other low level of verbal aggression, ignoring, competition); (2) intermediate (e.g., severe verbal exchange; one way physical aggression such as snatching a toy, throwing a toy, or blocking access; crankiness; or whining); (3) high (e.g., struggling/wrestling, tugging on the partner, chasing the partner, or other reciprocal physical aggression); and (4) very high (e.g., hitting or other severe negative physical contact or involvement).

For harmony, the scale was defined as: (0) no harmonious interaction; (1) low harmony (e.g., a low level of verbal or physical correspondence between partners such as trying to keep the play or talk going, following a suggestion, or agreeing on a role or toy occupation); (2) intermediate (e.g., an intermediate level of verbal or physical correspondence such as a compliment, reciprocal smiling, or involuntary turn taking of toy/role or assistance); (3) high (e.g., high level of verbal or physical correspondence such as reciprocal laughing, singing, or dancing, or voluntary turn taking/yielding of toy occupation or role); and (4) very high (e.g., intensive positive physical contact or correspondence such as hugging and jumping around with excitement).

Frequency scores for each construct were computed by counting the number of intervals in which interaction qualities were marked. Frequency scores are rates (or proportions) for the 10 intervals within the 5-minute observation period whereas intensity

scores (i.e., intensity scale points described as the above) were not averaged over all intervals but only for those intervals in which an intensity score was 1 or greater. Each recorded play session (i.e., 5 minutes per dyad) was scored for conflicted or/and harmonious interaction. When the child could not be coded because he/she was off-camera and made no sounds indicative of interaction quality, the interval was coded as "U" (meaning uncodable). The proportion of unscorable intervals was 0.5 % for Conflict and 1.1% for Harmony.

Friendship. Both teachers in each classroom identified dyads who were friends (i.e., by circling the pairs of children that are friends among a list of pairs (e.g., 105 pairs in a class of 15 children). Dyads identified by both teachers as close friends scored 2 (i.e., identified twice); dyads identified by only one teacher scored 1 (i.e., identified once as friends), and those who were not marked as friends scored 0 (i.e., not friends).

Dominance. Teachers identified the dominant child for each dyad by circling the dominant child's name in a list of dyads. The teachers were given a definition of dominance that emphasized asymmetries of power between the two children (i.e., one child is more powerful and the other child yields or gives in to coercion or the threat of coercion by the other). More specifically, teachers were asked to circle the child that is more dominant in terms of who prevails over whom, who tends to win when there is a disagreement. For example, children often engage in conflict over toys and there is something new and attractive, then who tends to get it, who tends to 'call the shots', who tends to get their own way, or who tends to influence others around them? If both teachers identified the same child as dominant in the dyad, the dyad received a score of 2 (established dominance), but if teachers disagreed on the dominance within a dyad (i.e.,

one teacher marked child 1, and the other teacher marked child 2 as dominant), the dyad received a score of 1 (dominance not established).

Age. Dyads were pairs of three- and four-year-olds who were members of an age-based classroom. Children aged under 48 months at the beginning of the school year were classified as "3 year olds" or "younger" children. Children who were 48 months or above at the beginning of the school year were "4 year olds" or "older" children.

Sex Composition. The sex composition of each dyad was noted as being a female-female, male-male, or mixed (i.e., female-male) pair.

Affect expression. The affect coding system developed by Akers and Vaughn (see Shin et al., in press) was used for assessment of affect expression of children. Affect expressiveness was coded from the same recorded dyadic play sessions that were used to code for harmony and conflict.

The play sessions were coded in 15-second segments (i.e., 20 segments per dyadic interaction) and each child was scored as displaying (or not) positive and/or negative affect in facial, vocal, and gestural modes. For the purpose of this study, emotions were recorded as the general valence of the expression (i.e., positive or negative) in order to facilitate the coding process appropriate to young children. For example, happiness, joy, and excitement were coded as positive affect expressiveness whereas anger, fear, sadness, disappointment, or undifferentiated distress and were coded as negative affect. When no affect was observed during the interval, even though the coder had full view of the child's face, no code was entered into the grid, and these were assumed to be neutral affect intervals. When the child could not be coded because he/she was off camera and made no sounds indicative of affect, or because he/she had his/her back turned to be camera and

makes no other sound/gesture to indicate affect, the interval was coded as "U" (meaning unscoreable).

Each team of raters who was trained to score child affect or harmony/conflict or to collect classroom data had no prior knowledge of the children. This method has been used with the same sample of children by Akers (2006) and Shin et al. (in press) and within-rater agreement level was 85% or higher (kappas > .7) for positive and negative affect codes. Affect frequency scores were converted to rate scores (per 15-second interval) to adjust for differences in dyadic participation and for intervals in which the child was off-camera and could not be scored. Dyadic scores for both positive and negative affect expressiveness were calculated by averaging the two individual children's affect expressiveness scores.

Social Competence. According to previous studies, social competence can be modeled as a hierarchically organized latent construct with causal relations to subordinate constructs identified by Vaughn et al. (2009). Three measurement families of social competence were included in this study: (1) comprehensive behavior descriptions summarized using Q-sort techniques, (2) interaction, and (3) sociometric acceptance. The seven measured indicators of social competence were two Q-sort scores, and three interaction scores including visual attention received from peers, initiated positive interactions, and initiated neutral interactions, and two sociometric scores of positive nominations and paired-comparisons). In order to generate dyadic scores for social competence, the two composite scores of seven measurements for two children in a dyad were averaged for a dyad score of social competence (see Vaughn et al., 2009). Overall social competence scores (i.e., the average across measured indicators) for children over

multiple raters had alphas >.8 on average. The following is a description of the three families of measurements of social competence that were previously used in Bost et al. (1998) and Vaughn (2001; Vaughn et al., 2009).

Q-sort description measures. Observers worked as teams of two in each classroom. Each observer independently spent between 16 to 20 hours observing the children in a given classroom and took notes on the behaviors and attributes of individual children across a variety of activity settings (e.g. meal times, small groups, free-play indoors, outdoor play, transition activities such as standing in lines, pre- and post-naptime, and cleanup). When observations were completed, each of the two assistants described all of the children using two sets of Q-sorts (Block & Block California Child Q-set-100 items-CCQ; and the Bronson revision of the Baumrind Preschool Q-set-72 items-PQ) (Block & Block, 1980; Baumrind, 1967). Q-sort descriptions of each child were used to derive social competence scores for each child using the criteria published by Waters, Noyes, Vaughn, and Ricks (1985). By correlating the description of the "empirical" child with hypothetical descriptions of "ideal" children, social competence scores were derived. Agreement between observers within (i.e., Q-correlations for two observations of a given child using the same Q-set) and across the two Q-sorts (i.e., Pearson correlations for a sample of children for social competence derived from the sorts of one observer using the CCQ and from the sorts of a second observer using the PQ) range from .57 to .76 across rater-dyads and classrooms.

Interaction Measures. This family of social competence measures was derived from observations of *visual regard given to peers* and *the initiation of interaction to peers*. Observation was executed throughout the preschool day and observers watched

each participating child in class on a given day for a 15-second interval to assess initiation of interaction. A target child was observed for each round of the class when the child's name appeared on a class list, and no child was observed twice before all children present were observed once. At the end of the interval, the observer identified all children with whom the target child interacted and the initiator of the interaction, as well as overall tone of each interaction (i.e., positive, negative, or neutral). Kappa coefficients for the interaction codes ranged from .55 to .85 across the three interaction categories, and the median was .69. For the purposes of this report, only the standardized rate scores for positive and neutral interactions initiated were retained for analysis (see Vaughn, 2001). Visual regard consists of two categories: A *look* was defined as the orientation of head and/or eyes toward another person for a period of two seconds or more; A *glance* was defined as a similar orientation of head and/or eyes for less than two seconds (see Vaughn and Waters, 1981). Teams of observers who watched each child present in class for a 6-second interval and recoded the identity codes of peers receiving a unit of visual attention from the observed target. Kappa coefficients for visual regard in this sample ranged from .60 to .90 across all rater pairs, median = .70. To make classroom level observations comparable across all classes, rate scores were calculated by dividing the total scores of interaction and visual regard by the number of rounds a child was present in class for observation.

Sociometric acceptance measures. Positive and negative sociometric scores were derived from a *nominations* task (McCandless & Marshall, 1957). Each child was interviewed to choose three peers whom he or she especially liked from digital photographs of children. Scores were derived by calculating the total number of times a

child was chosen by peers in both positive (first three choices only) and negative choice segments. These sums were divided by the number of children making ratings in the classroom. Sociometric acceptance was also scored from *a paired comparisons* task. Children viewed each pair of children on a laptop computer screen and made a choice concerning "which of these two children do you especially like?" An average score was calculated by summing the choices received from peers in the classroom and dividing that total by the number of peers making choices. Both nomination and paired comparison scores were standardized within each classroom to adjust for differences in classroom sizes.

Hypotheses and Plan of Analysis

H1. Interaction qualities (i.e., conflict and harmony) will differ among dyads depending on demographic characteristics of dyads (i.e., age and sex composition).

H1-1. Older children will have more frequency of conflict and harmony, more intensity of harmony, but less intensity of conflict than younger children.

H1-2. Girl dyads will have more harmony and less conflict than boy dyads or mixed sex dyads at the levels of both frequency and intensity.

H1-3. Interaction qualities by age (or sex composition) of dyads will differ by sex composition (or age) of dyads.

H2. Interaction qualities (i.e., conflict and harmony) of a dyad will differ depending on relationship status of dyads (i.e., friendship and dominance).

H2-1. Dyads who were identified by both teachers as being close friends will have a higher frequency of conflict and harmony, a higher intensity of harmony, but

a lower intensity of conflict than dyads of non-friends or dyads who were identified by only one teacher as being friends.

H2-2. Dyads with established dominance will have less conflict but more harmony, in both frequency and intensity, than dyads for which dominance has not been established.

H2-3. Interaction qualities by friendship status (or dominance status) of dyads will differ depending on dominance status (or friendship status) of dyads.

H3. Relationship statuses will predict interaction qualities uniquely after controlling for demographics, interaction of demographic and relational, behavioral characteristics, and socio-emotional characteristics of dyads.

Hierarchical regressions for hypotheses 1 (H1) and 2 (H2) were conducted to test the predictive power, independently or in interaction of either demographic (H1) or relationship status variables (H2), on the four dependent variables (i.e., frequency of conflict, intensity of conflict, frequency of harmony, and intensity of harmony). Bivariate correlation analyses were conducted in order to test the magnitude and direction of associations between the dyadic demographic (i.e., age and sex composition) and relational characteristics (i.e., friendship and dominance) and interaction quality variables. Unstandardized and standardized b coefficients along with standard error were reported to indicate the significance of the hypothesized associations. Hierarchical linear regression was used examine changes in interaction qualities after adding new sets of predictor variables. First, main effect variables and interaction effect variables were entered in the first and the second step respectively. Next, behavioral characteristic covariates (i.e., out-dyad frequency of conflict and out-dyad frequency of harmony) were

36

included in the following step. Then, socio-emotional characteristic variables (i.e., positive and negative affect expressiveness and a composite score for social competence) were added in the last step as covariates.

A second hierarchical regression analysis was employed to test hypothesis 3 by entering main effect variables (i.e., friendship and dominance) in the first step, and control variables in the following steps: demographic control variables (i.e. age and sex composition) in step 2; interaction of demographic and relationship status control variables (i.e., Age x Friendship, Age x Dominance, and Sex Composition x Friendship) in step 3; and behavioral and socio-emotional characteristics of dyads (i.e., out-dyad frequency of conflict, out-dyad frequency of harmony, positive affect expressiveness, negative affect expressiveness, and social competence) in the last step. Therefore, the main effect of relationship status was tested even if the other variables were included in the prediction of interaction qualities.

The hypothetical model describing associations and directions of effects among all the variables (age, sex composition, friendship, dominance, conflict, harmony at intensity and frequency levels with covariates of behavioral trait-like disposition, positive and negative affect expressiveness, and social competence) based on the literature review is shown in Figure 1.

Figure 1. Hypothetical Model describing Associations Among Demographic, Relational, Behavioral, Socio-Emotional Characteristics, and Interaction Qualities of Dyads Based on Literature Review

Figure 1 . Hypothetical Model Describing Associations Among Variables Based on Literature Review

RESULTS

Preliminary Analyses

Dyadic data of the type used in this study pose special challenges for data analysts because, although dyads are unique, the elements (children) making up a given dyad also participate in many other dyads and this fact imposes dependencies across dyads. Furthermore, children from different classrooms have different teachers and different complements of peers, which might affect the frequency and quality of harmonious and conflicted transactions within the dyad. A multi-level analysis was conducted to determine whether significant between-classroom variance in the dyadic conflict and harmony scores could be detected. If all of the reliable variance were found within classrooms rather than between classrooms, this would indicate that class-level variables were not contributing significantly to the dyadic harmony and conflict scores. More specifically, the intraclass correlation coefficient for the data indicates how much of the variance is attributable to classroom-level attributes. If the intraclass correlation coefficient shows a significant variation (i.e., $p < .05$) across classrooms, multi-classroom-level variables will be added for subsequent analyses. If between-classroom variability is not significant, it is justified to assume dyadic interaction quality scores are not influenced by classroom-level effects.

To examine potential influences of unique dyad member characteristics on the dyadic conflict and harmony scores, separate conflict and harmony scores were calculated for each dyad member based on each child's interactions with all other partners. These "out-dyad" scores are an average of the two partners' mean dyadic

conflict and harmony scores with all other partners. "In-dyad" scores are the average conflict and harmony scores for a given pair of children.

No Classroom Impact on Dyad. Mixed modeling (Peugh & Enders, 2005) was employed to examine classroom differences in interaction qualities (i.e., whether between-classroom intercept variance within the same age is statistically significant or not). In the cross-sectional context (i.e., dyads nested within classrooms), it was assumed that dyads (level 1) within a specific classroom (level 2) would share the same value for conflict and harmony scores. An unconditional means model was used to compute the proportion of variability in outcome scores (i.e., conflict and harmony) that existed among level 2 (i.e., classroom) units. The random effects ANOVA model is given below:

Level 1 (Dyad): $Y_{ij} = B_{0j} + r_{ij}$ (residuals)

Level 2 (Class): $B_{0j} = Y_{00}$ (grand mean)+ u_{0j} (classroom specific deviation)

Combined: $Y_{ij} = Y_{00}$ (grand mean) + u_{0j} (classroom specific deviation) + r_{ij} (residuals)

The Level 1 model describes the *i*th dyad's conflict score as a function of the mean conflict score for the *j*th classroom (B_{0j}) plus a residual (r_{ij}) that reflects dyad differences around a given classroom mean. The Level 2 model describes mean conflict scores for a given classroom (B_{0j}) as a function of the grand mean (Y_{00}) plus classroom-specific deviation (u_{0j}). Substituting the Level 2 equation into the Level 1 equation gives the combined model in equation 3. The three parameters estimated by the combined unconditional means model include one fixed effect (i.e., the grand mean, Y_{00}) and variance estimates for the Level 1 and Level 2 residuals. As shown in Tables 1 and 2, the grand means of conflict were .68 for 3-year-old groups and .74 for 4-year-old groups, and

variance components suggested statistically significant variability at the within-room level (.19 for Age 3, $p < .01$; .13 for Age 4, $p < .01$) but not at the between-room level (.01 for Age 3, $p > .05$ and .01 for Age 4, $p > .05$). The p values of between-room variance for both age groups are >.05; thus, there is no significant effect of classroom membership on levels of conflict.

The grand means of harmony were .99 for 3-year-old groups and 1.18 for 4-year-old groups, and variance components suggested statistically significant variability at the within-room level (.23 for Age 3, $p < .01$; .15 for Age 4, $p < .01$) but not at between-room (.02 for Age 3, $p > .05$ and .01 for Age 4, $p > .05$). The analyses suggest that there was no significant effect of classroom membership on levels of harmony. Therefore, it was justified to use dyad scores of conflict and harmony without a variable accounting classroom membership in subsequent analyses.

Table 1a. Mixed Model Parameter Estimates for Conflict within Age 3

Parameter	Mean	SE	df	p
Estimates of fixed effects				
INTERCEPT (grand mean)	.68	.03	11.92	.00
Estimates of Covariance Parameters				
RESIDUAL (within-room variance)	.19	.01		.00
INTERCEPT (between-room variance)	.01	.01		.06

Table 1b. Mixed Model Parameter Estimates for Conflict within Age 4

Parameter	Mean	SE	df	p
Estimates of fixed effects				
INTERCEPT (grand mean)	.74	.04	5.64	.00
Estimates of Covariance Parameters				
RESIDUAL (within-room variance)	.13	.01		.00
INTERCEPT (between-room variance)	.01	.01		.17

Table 2a. Mixed Model Parameter Estimates for Harmony within Age 3

Parameter	Mean	SE	df	p
Estimates of fixed effects				
INTERCEPT (grand mean)	.99	.04	10.99	.00
Estimates of Covariance Parameters				
RESIDUAL (within-room variance)	.23	.01		.00
INTERCEPT (between-room variance)	.02	.01		.05[a]

[a]. The value of .054 was rounded off.

Table 2b. Mixed Model Parameter Estimates for Harmony within Age 4

Parameter	Mean	SE	df	p
Estimates of fixed effects				
INTERCEPT (grand mean)	1.18	.05	5.51	.00
Estimates of Covariance Parameters				
RESIDUAL (within-room variance)	.15	.01		.00
INTERCEPT (between-room variance)	.01	.01		.17

Differences between In-Dyad (with One Given Pair) and Out-Dyad (with All Other Pairs) Scores. In order to test whether dyad scores were associated with individuals' scores of conflict and harmony, individual conflict and harmony scores (i.e., "out-dyad" scores) were calculated from dyad scores for each of the child's partners (i.e., "in-dyad" score). The sum of all conflict or harmony scores that the child received from all dyads he/she interacted with, except the specific dyad partner under analysis, was divided by the number of playmates except the dyad partner. For example, child1's (i.e., C1's) average frequency of conflict score in the dyad (C1, C2) was calculated as follows:

C1_FrqConf = {(C1, C3)+(C1, C4)…. (C1, Cn)} / n-1,

and C2's average frequency of conflict score in the dyad (C1, C2) is

C2_FrqConf = {(C2, C3)+(C2, C4)…. (C2, Cn)} / n-1.

The average of C1average (C1_FrqConf) and C2 average (C2_FrqConf) is referred to as the "out-dyad" conflict frequency score. The "out-dyad" harmony frequency score was obtained in the same way the out-dyad conflict frequency score was calculated. Calculation of the average of individual intensity score was not appropriate since a substantial number of dyads were observed to have no conflict or harmonious interaction during the episode; thus, they received zero intensity scores (23% for conflict; 11% for harmony). Consequently, for intensity, only dyad intensity scores for conflict and harmony were included for further analyses.

Missing Data Treatment. Imputation of missing data was considered as an alternative treatment of missing data for the study because listwise deletion often yields a substantial loss of power. Hence, multiple imputation of missing data was employed over other methods of data imputation since multiple imputation possesses nearly optimal statistical properties to perform well not only if the data are missing at random but also if they are systematically missing (Allison, 2001). Multiple imputation performs better over other imputation methods that often underestimate standard errors and *p*-values (Schafer & Olsen, 1998). [1]

---

[1] For accuracy of interpretation in the current study, listwise deletion with imputed data were performed and results with the imputed data (i.e., complete data) were presented since there was no substantial difference found between two data sets (i.e., original data with missing values vs. imputed data).

Normality in Data Distribution. Distributions of data in interaction qualities (i.e., intensity and frequency of conflicted and harmonious interaction) were tested in terms of the symmetry of distribution. Frequency and intensity of harmony were found to be normally distributed in the datasets (i.e., skewness < 1) whereas frequency and intensity of conflict were found to be skewed (i.e., 1.5 < skewness < 2.5); thus, the conflict scores were log-transformed; however, this did not improve the skewness; thus, the imputed raw values of conflict scores were used.

Associations Between In-Dyad and Out-Dyad scores. Correlations between the in-dyad and out-dyad scores provide an indication of how typical the conflict and harmony scores were for a given dyad compared to the children's behavior in other dyads (Table 3). As shown in Table 3, for harmony, a positive correlation between in-dyad and out-dyad frequency scores of harmony was found ($r = .41$, $p < .001$). Likewise, for conflict, out-dyad frequency of conflict was positively correlated with in-dyad frequency of conflict ($r = .28$, $p < .001$). Thus, positive associations for frequency within the same interaction quality were found. Both in-dyad and out-dyad frequency scores of conflict were significantly correlated with intensity of conflict ($r = .18$, $p < .001$; $r = .06$, $p < .05$, respectively) as was in-dyad frequency of harmony with intensity of harmony ($r = .10$, $p < .01$); however, a negative association between out-dyad frequency of harmony and intensity of harmony was found ($r = -.09$, $p < .01$). Significant correlations between out-dyad and in-dyad frequency scores suggest a modest degree of trait-influence on the interactive behavior of individual children at the within-dyad level.

45

Table 3.

Correlations Between Interaction Quality Variables (Listwise N=1233)

Subscale	1	2	3	4	5	6
1. In-Dyad Frequency Conflict	____	-.10**	.18***	-.03	.28***	.06*
2. In-Dyad Frequency Harmony			-.20***	.10**	.05	.41***
3. Intensity Conflict				.09**	.06*	-.19***
4. Intensity Harmony					.05	-.09**
5. Out-Dyad Frequency Conflict						.21***
6. Out-Dyad Frequency Harmony						____

*p <.05, **p <.01, ***p <.001

Association between Demographic and Relationship Variables. In order to give an overview of the bivariate relations among age, sex composition, friendship, and dominance, frequencies and percentages of observations were examined using a cross-tabulation (Tables 4, 5, & 6). Forty-eight percent of 4-year-old dyads were identified as friends whereas 35% of 3-year-old dyads were seen as friends either by one teacher or by two teachers ($X^2 = 31.37$, df = 2, $p = .000$). Female dyads were most likely to be identified as friends by two teachers (25%) whereas mixed sex dyads were most likely to be identified as not being friends (52%) ($X^2 = 78.71$, df = 4, $p = .000$). Older dyads were more likely to have established dominance within a dyad (68%) than younger dyads (61%) ($X^2 = 9.19$, df = 1, $p = .002$). Forty-four percent of dyads with established dominance were identified as friends by one or two teachers whereas 31% of dyads with equal power in the relationship were seen as friends by one or two teachers ($X^2 = 34.43$, df = 2, $p = .000$).

Table 4.

Bivariate Statistics for Age, Friendship, and Dominance

		Age		
		3	4	Total
		n (%)	*n* (%)	*N (%)*
Sex	FF	232 (20)	87 (15)	319
Composition		*(73)*	*(27)*	*(100)*
$X^2 = 8.76$	FM	598 (50)	298 (50)	895
df = 2		*(67)*	*(33)*	*(100)*
p = .013	MM	359 (30)	211 (35)	570
		(63)	*(37)*	*(100)*
	Total	1189 (100)	596 (100)	1784
Friendship	F0	774 (65)	306 (51)	1080
$X^2 = 31.34$		*(72)*	*(28)*	*(100)*
df = 2	F1	267 (23)	192 (32)	459
p = .000		*(58)*	*(42)*	*(100)*
	F2	148 (12)	97 (16)	245
		(60)	*(40)*	*(100)*
	Total	1189 (100)	595 (100)	1784
Dominance	D1	467 (39)	190 (32)	657
$X^2 = 9.19$		*(71)*	*(29)*	*(100)*
df = 1	D2	722 (61)	405 (68)	1127
p = .002		*(64)*	*(36)*	*(100)*
	Total	1189 (100)	595 (100)	1784

Note. Sex composition was categorized as FF (female-female), FM (female-male), and MM (male-male); Friendship was categorized as F0 (identified as non-friends), F1 (identified as friends by one teachers), and F2 (identified as friends by two teacher); Dominance was categorized as D1 (not established paired dominance), and D2 (established paired dominance)

Table 5.

Bivariate Statistics for Sex Composition, Friendship, and Dominance

		Sex Composition			
		FF	FM	MM	Total
		N (%)	N (%)	N (%)	N (%)
Friendship	F0	171 (54)	612 (68)	297 (52)	1080
$X^2 = 78.71$		*(16)*	*(57)*	*(28)*	*(100)*
df = 4	F1	69 (22)	200 (22)	190 (33)	459
p = .000		*(15)*	*(44)*	*(41)*	*(100)*
	F2	79 (25)	83 (9)	83 (15)	245
		(32)	*(34)*	*(34)*	*(100)*
	Total	319 (100)	895 (100)	570 (100)	1784
Dominance	D1	112 (35)	332 (37)	213 (37)	657
$X^2 = .50$		*(17)*	*(51)*	*(32)*	*(100)*
df = 2	D2	207 (65)	563 (63)	357 (63)	1127
p = .777		*(18)*	*(50)*	*(32)*	*(100)*
	Total	319 (100)	895 (100)	570 (100)	1784

Note. Sex composition was categorized as FF (female-female), FM (female-male), and
MM (male-male); Friendship was categorized as F0 (identified as non-friends), F1
(identified as friends by two teachers), and F2 (identified as friends by one teacher);
Dominance was categorized as D1 (not established paired dominance), and D2
(established paired dominance)

Table 6.

Bivariate Statistics for Friendship and Dominance

		Friendship			
		F0	F1	F2	Total
		N (%)	N (%)	N (%)	N (%)
Dominance	D1	454 (42)	142 (31)	61 (25)	657
$X^2 = .34$		*(69)*	*(22)*	*(9)*	*(100)*
df = 2	D2	626 (58)	317 (69)	184 (75)	1127
p = .000		*(56)*	*(28)*	*(16)*	*(100)*
	Total	1080 (100)	459 (100)	245 (100)	1784

Note. Friendship was categorized as F0 (identified as non-friends), F1 (identified as friends by two teachers), and F2 (identified as friends by one teacher); Dominance was categorized as D1 (not established paired dominance), and D2 (established paired dominance)

The bivariate statistics results indicate that (1) age level was significantly associated with friendship and with dominance; (2) dyadic sex composition was significantly related to friendship but not related significantly to dyadic dominance; and (3) friendship and dominance were significantly related to each other. Hence, these dependencies among the independent variables require consideration of interaction effects in subsequent analyses.

Differences across Sub-Groups of Dyads. Descriptive statistics were computed to determine means and standard deviations of harmony and conflict variables for subgroups of dyads based on age, sex, friendship, and dominance (i.e., there is a total 36 subgroups based on 2 categories of age, 3 categories of sex composition, 3 categories of friendship, and 2 categories of dominance) (Table 7).

Table 7a.

Means and Standard Deviations for Frequency of Conflict Grouped by Age, Dyadic Sex Composition, Friendship, and Dominance

Age	Sex Comp-osition	Dominance	Not friends		Friends by one teacher		Friends by two teacher		Total	
			n	Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SD*)	*N*	Mean (*SD*)
3	FF	Not - Established	63	.18 (.20)	15	.23 (.23)	10	.19 (.15)	88	.20 (.19)
		Established	69	.16 (.16)	30	.30 (.27)	45	.21 (.18)	144	.22 (.20)
	FM	Not - Established	204	.23 (.22)	25	.19 (.17)	10	.26 (.29)	239	.23 (.23)
		Established	233	.21 (.23)	88	.28 (.22)	38	.23 (.21)	359	.24 (.22)
	MM	Not - Established	93	.28 (.23)	30	.23 (.23)	17	.29 (.27)	140	.27 (.24)
		Established	112	.19 (.22)	79	.23 (.25)	28	.32 (.34)	219	.25 (.27)
4	FF	Not - Established	11	.18 (.25)	6	.28 (.31)	7	.12 (.12)	24	.19 (.23)
		Established	28	.24 (.21)	18	.24 (.17)	17	.37 (.24)	63	.28 (.21)
	FM	Not - Established	56	.21 (.24)	31	.24 (.23)	6	.17 (.24)	93	.21 (.25)
		Established	119	.28 (.24)	56	.30 (.20)	29	.34 (.29)	204	.31 (.25)
	MM	Not - Established	27	.24 (.22)	35	.28 (.26)	11	.33 (.31)	73	.28 (.26)
		Established	65	.28 (.23)	46	.37 (.25)	27	.40 (.29)	138	.35 (.26)
Total *N*	Mean (*SD*)		1080	.22 (.22)	459	.26 (.23)	245	.27 (.25)	1784	.25 (.23)

Note. Sex composition was categorized as FF (female-female), FM (female-male), and MM (male-male).

Table 7b.

Means and Standard Deviations for Frequency of Harmony Grouped by Age, Dyadic Sex Composition, Friendship, and Dominance

Age	Sex Composition	Dominance	Not friends		Friends by one teacher		Friends by two teacher		Total	
			n	Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SD*)	*N*	Mean (*SD*)
3	FF	Not - Established	63	.49 (.25)	15	.37 (.29)	10	.57 (.28)	88	.48 (.27)
		Established	69	.43 (.27)	30	.37 (.23)	45	.35 (.29)	144	.38 (.26)
	FM	Not - Established	204	.37 (.28)	25	.38 (.29)	10	.43 (.27)	239	.39 (.28)
		Established	233	.30 (.25)	88	.34 (.27)	38	.34 (.25)	359	.33 (.26)
	MM	Not - Established	93	.38 (.29)	30	.39 (.28)	17	.27 (.24)	140	.35 (.27)
		Established	112	.24 (.24)	79	.33 (.26)	28	.38 (.29)	219	.32 (.26)
4	FF	Not - Established	11	.49 (.29)	6	.28 (.31)	7	.38 (.34)	24	.38 (.31)
		Established	28	.53 (.26)	18	.45 (.28)	17	.49 (.25)	63	.49 (.26)
	FM	Not - Established	56	.45 (.29)	31	.34 (.31)	6	.15 (.12)	93	.31 (.24)
		Established	119	.52 (.28)	56	.44 (.27)	29	.39 (.29)	204	.45 (.28)
	MM	Not - Established	27	.43 (.29)	35	.33 (.31)	11	.49 (.35)	73	.42 (.32)
		Established	65	.52 (.29)	46	.46 (.26)	27	.47 (.24)	138	.48 (.26)
Total *N*	Mean (*SD*)		1080	.43 (.27)	459	.37 (.28)	245	.39 (.27)	1784	.40 (.27)

Note. Sex composition was categorized as FF (female-female), FM (female-male), and MM (male-male).

Table 7c.

Means and Standard Deviations for Intensity of Conflict Grouped by Age, Dyadic Sex Composition, Friendship, and Dominance

Age	Sex Comp-osition	Dominance	Not friends		Friends by one teacher		Friends by two teacher		Total	
			n	Mean (*SD*)	n	Mean (*SD*)	n	Mean (*SD*)	N	Mean (*SD*)
3	FF	Not - Established	40	1.35 (.39)	12	1.32 (.42)	9	1.17 (.42)	61	1.28 (.41)
		Established	52	1.37 (.48)	26	1.55 (.40)	33	1.34 (.47)	111	1.42 (.45)
	FM	Not - Established	157	1.28 (.43)	21	1.33 (.40)	7	1.31 (.41)	185	1.31 (.41)
		Established	164	1.42 (.55)	72	1.43 (.50)	29	1.31 (.41)	265	1.39 (.49)
	MM	Not - Established	78	1.32 (.44)	22	1.29 (.48)	13	1.29 (.38)	113	1.30 (.43)
		Established	73	1.64 (.61)	53	1.45 (.55)	20	1.65 (.90)	146	1.58 (.69)
4	FF	Not - Established	8	1.12 (.24)	3	1.94(1.50)	4	1.08 (.17)	15	1.38 (.64)
		Established	24	1.25 (.33)	16	1.10 (.17)	16	1.29 (.39)	56	1.21 (.30)
	FM	Not - Established	40	1.25 (.36)	24	1.37 (.39)	3	1.67 (.67)	67	1.43 (47)
		Established	99	1.26 (.38)	50	1.33 (.41)	25	1.37 (.32)	174	1.32 (.37)
	MM	Not - Established	22	1.10 (.20)	30	1.36 (.48)	8	1.58 (.65)	60	1.35 (.44)
		Established	52	1.32 (.38)	41	1.28 (.40)	23	1.30 (.43)	116	1.30 (.40)
Total N	Mean (*SD*)		809	1.31 (.40)	370	1.40 (.51)	190	1.36 (.47)	1369	1.36 (.46)

Note. Sex composition was categorized as FF (female-female), FM (female-male), and MM (male-male).

Table 7d.

Means and Standard Deviations for Intensity of Harmony Grouped by Age, Dyadic Sex Composition, Friendship, and Dominance

Age	Sex Comp-osition	Dominance	Not friends		Friends by one teacher		Friends by two teacher		Total	
			n	Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SD*)	*N*	Mean (*SD*)
3	FF	Not - Established	61	1.87 (.48)	14	1.53 (.59)	10	1.92 (.71)	85	1.77 (.59)
		Established	63	1.76 (.45)	28	1.83 (.55)	38	1.99 (.65)	129	1.86 (.55)
	FM	Not - Established	181	1.77 (.52)	21	2.03 (.49)	9	2.04 (.58)	211	1.95 (.53)
		Established	191	1.75 (.52)	79	1.80 (.55)	35	1.77 (.50)	305	1.77 (.52)
	MM	Not - Established	80	1.89 (.47)	27	1.84 (.54)	16	2.14 (.69)	123	1.66 (.57)
		Established	84	1.93 (.58)	70	1.88 (.61)	24	1.76 (.63)	178	1.86 (.61)
4	FF	Not - Established	11	1.92 (.24)	6	1.97 (.27)	6	2.07 (.73)	23	1.99 (.41)
		Established	28	1.93 (.48)	17	1.70 (.56)	16	2.11 (.83)	61	1.91 (.62)
	FM	Not - Established	49	1.85 (.40)	25	2.14 (.50)	5	1.73 (.72)	79	1.91 (.54)
		Established	117	1.79 (.51)	54	1.77 (.46)	24	1.89 (.40)	195	1.82 (.46)
	MM	Not - Established	21	1.59 (.42)	28	1.82 (.48)	10	1.99 (.40)	59	1.80 (.43)
		Established	62	1.82 (.42)	43	1.83 (.39)	27	1.95 (.60)	132	1.87 (.47)
Total *N*	Mean (*SD*)		948	1.82 (.46)	412	1.85 (.50)	220	1.87 (.62)	1580	1.85 (.53)

Note. Sex composition was categorized as FF (female-female), FM (female-male), and MM (male-male).

Primary Analyses

Correlations Between Demographics and Relationship Statuses and Interaction

Qualities of Dyads. Age, as shown in Table 8, was positively correlated with frequency

of conflict ($r = .07$, $p < .05$) and frequency of harmony ($r = .17$, $p < .001$) as expected.

However, age was negatively correlated with intensity of conflict ($r = -.09$, $p < .01$). Sex

composition was correlated with frequency of conflict, as expected; girl-dyads had lower

frequency of conflict ($r = -.08$, $p < .01$) whereas boy-dyads had greater frequency of

conflict ($r = .10$, $p < .01$).

Friendship, a dyadic relationship status, was positively correlated with frequency

of conflict ($r = .08$, $p < .01$) and intensity of harmony ($r = .07$, $p < .05$) as expected.

However, unexpectedly, friendship was not significantly correlated with frequency of

harmony and intensity of conflict. Dominance was positively correlated with frequency

of conflict ($r = .06$, $p < .05$) and intensity of conflict ($r = .08$, $p < .01$) unexpectedly as

well.

Table 8.

Correlations Between Demographic and Relationship Variables and Interaction

Qualities of Dyads (Listwise N =1233)

	Age	Sex Composition1	Sex Composition2	Friendship	Dominance
Frequency Conflict	.07*	-.08**	.10**	.08**	.06*
Frequency Harmony	.17***	.05	-.02	-.03	-.02
Intensity Conflict	-.09**	-.01	.05	.02	.08**
Intensity Harmony	.03	.01	.04	.07*	-.03

Note. Sex Composition is coded as two dummy variables; sex composition1 (female

dyads = 1) and sex composition2 (male dyads = 1)

*p <.05, **p <.01, ***p <.001

  Correlations Between Demographic, Relational, Behavioral (Trait-like), and

Socio-Emotional Characteristics of Dyads. As expected, the trait-like behavioral (i.e.,

out-dyad) frequency score for conflict had a positive correlation with age, boy-dyads,

friendship, and dominance, whereas it had negative correlation with girl-dyads (i.e., girl-

dyads had less trait-like conflict frequency) (Table 9). More specifically, older children

than younger children, boy dyads than girl dyads or mixed sex dyads, friend-pairs than

non-friend pairs, or children with unequal power relation tended to have more frequent

conflict with other partners in general. In the mean time, older children, girl dyads,

children with unequal power relation tended to have more frequent harmony with other

partners in general than their counterparts. Boy dyads or friend-dyads had lower tendency

to engage harmonious interaction.

Regarding associations with socio-emotional characteristics, positive affect expressiveness was positively associated with age; however, unexpectedly, positive affect expressiveness was negatively associated with friendship. Negative affect expressiveness was significantly negatively associated with age and positively with friendship but was not significantly associated with sex composition of dyads and dominance variables. Social competence had a significant association with girl-dyads ($r = .06$, $p < .01$) and friendship ($r = .18$, $p < .001$).

Table 9.

Correlations Between Demographic, Relational and Socio-Emotional Characteristics of Dyads with Complete Data (N = 1784)

	Age	Sex1	Sex2	Friendship	Dominance
Out-Dyad Frequency Conflict	.28***	-.05*	.06*	.16***	.06*
Out-Dyad Frequency Harmony	.37***	.06*	-.08**	-.06*	.06*
Positive Affect Expressiveness	.33***	-.05	.03	-.07**	-.03
Negative Affect Expressiveness	-.16***	.00	.00	.07**	-.01
Social Competence	-.01	.06**	-.04	.18***	.03

Note. Sex Composition is coded as two dummy variables; sex composition1 (female dyads = 1) and sex composition2 (male dyads = 1)

*p <.05, **p <.01, ***p <.001

Prediction of Conflict Frequency by Demographics. Table 10a reports on the role of demographic characteristics of dyads (i.e., age and sex composition) as predictors of frequency of conflict. Results yielded support for hypothesis 1; that is, the main effects of demographic factors (i.e., age and sex composition 2) were found to be significant in the prediction of conflict frequency, however the prediction did not remain significant after behavioral and socio-emotional characteristics of dyads were included. There was no interaction effect of age and sex found in the prediction of conflict frequency among dyads. Children's trait-like frequency of conflict behavior (i.e., conflict outside of the dyadic relationship) and negative affect expressiveness were associated with a higher frequency of dyadic conflicts.

The model with age and sex composition taken together accounted for a small amount of significant variance in the frequency of conflict. The full set of predictors in this model explained 15% of the variance in dyadic frequency of conflict. Thus, the current study found that older children, boy-dyads, children who have greater conflict in their relationships in general, or are more likely to express negative affect in their dyadic play have more conflict in specific dyadic play episodes.

Table 10a.

Regression on Frequency of Conflict using Demographic Characteristics of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)

	Frequency of Conflict					
	B	SEB	β	df	$R^2 (\Delta R^2)$	B final step
Step1: Main Effects				3	.02***	
Age (A)	.06	.01	.11***			.01
Sex Composition1 (S1)	-.02	.02	-.04			-.10
Sex Composition2 (S2)	.02	.01	.05*			-.15
Step2: Interaction Effects				5	.02***	
A x S1	.01	.03	.04		(.00)	.07
A x S2	.03	.03	.22			.19
Step3: Behavioral Characteristics				7	.14***	
Out-Dyad Conflict Frequency	.90	.06	.37***		(.12***)	.34***
Out-Dyad Harmony Frequency	-.01	.04	-.01			.02
Step4: Socio-Emotional Characteristics				10	.15*** (.01**)	-.05
Positive Affect Expressiveness	-.12	.06				.07**
Negative Affect Expressiveness	.38	.13				.03
Social Competence	.02	.01				

*p <.05, **p <.01, ***p <.001

Prediction of Frequency of Harmony by Demographics. Table 10b reports on the role of demographic characteristics of dyads (i.e., age and sex composition) as predictors of frequency of harmony. Results yielded support for hypothesis 1; dyads' age and sex composition was positively associated with frequency of harmony, however the association did not remain significant after behavioral and socio-emotional characteristics of dyads were taken account of. More specifically, older dyads and girl-dyads reported significantly greater frequency of harmony than younger dyads and boy-dyads or mixed sex dyads. No significant interaction effect of age and sex was found in prediction of harmony frequency. Children's trait-like frequency of harmony behavior (i.e., harmony outside of the dyadic relationship), positive affect expressiveness, and social competence were associated with a higher frequency of dyadic harmony.

The model with age and sex composition taken together accounted for a small amount of significant variance in the frequency of harmony. The full set of predictors in this model explained 22% of the variance in dyadic frequency of harmony. Thus, older age, girl-dyad composition, a tendency to have harmonious interactions in other dyadic relationships, greater positive affect expressed in their relationships, as well as greater social competence were associated with the frequency of harmony in specific dyadic relationships.

Table 10b.

Regression on Frequency of Harmony using Demographic Characteristics of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)

	Frequency of Harmony					
	B	SEB	β	df	$R^2 (\Delta R^2)$	B final step
Step1: Main Effects				3	.04***	
Age (A)	.11	.01	.19***			.02
Sex Composition1 (S1)	.07	.02	.09***			.26
Sex Composition2 (S2)	-.01	.02	-.01			.09
Step2: Interaction Effects				5	.04***	
A x S1	-.07	.04	-.29		(.00)	-.19
A x S2	.03	.03	.14			-.07
Step3: Behavioral Characteristics				7	.21***	
Out-Dyad Conflict Frequency	-.02	.07	-.01		(.16***)	.00
Out-Dyad Harmony Frequency	.93	.05	.44***			.40***
Step4: Socio-Emotional Characteristics				10	.22*** (.01***)	
Positive Affect Expressiveness	.27	.07				.09***
Negative Affect Expressiveness	-.13	.15				-.02
Social Competence	.04	.01				.06**

*p <.05, **p <.01, ***p <.001

Prediction of Intensity of Conflict by Demographics. Table 10c reports on the role of demographic characteristics of dyads (i.e., age and sex composition) as predictors of intensity of conflict. Results yielded support for hypothesis 1; the main effects of demographic factors (i.e., age and sex composition) were found to be significant, however the prediction did not remain significant after behavioral and socio-emotional characteristics of dyads were added. There was no interaction effect of age and sex composition in the prediction of conflict intensity of dyads. More specifically, younger children and boy-dyads engaged in more intensive conflict.

As expected, children's dispositions towards greater conflict in other relationships and social competence were associated with higher intensity of dyadic conflicts, whereas children's disposition towards greater harmony in other relationships was significantly associated with lower intensity of conflict in their dyadic relationship with peers in the study. The model with age and sex composition taken together accounted for a small amount of significant variance in the intensity of conflict. The full set of predictors in this model explained 7% of the variance in dyadic frequency of conflict. Thus, the current study found that younger children, boy-dyads, children who have greater conflict and less harmony in their relationships in general, and children with higher social competence have more intensive conflict in dyadic relationships.

Table 10c.

Regression on Intensity of Conflict using Demographic Characteristics of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1369)

	Intensity of Conflict					
	B	SEB	β	df	R^2 (ΔR^2)	B final step
Step1: Demographics				3	.02***	
Age (A)	-.11	.03	-.11***			.00
Sex Composition1 (S1)	-.01	.04	-.01			.23
Sex Composition2 (S2)	.06	.03	.06*			.25
Step2: Interaction Controls				5	.02***	
A x S1	-.07	.08	-.20		(.00)	-.23
A x S2	-.09	.06	-.30			-.21
Step3: Behavioral Controls				7		
Out-Dyad Conflict Frequency	.45	.14	.09**		.06***	.08**
Out-Dyad Harmony Frequency	-.81	.11	-.23***		(.04***)	-.23***
Step4: Socio-Emotional Controls				10		
Positive Affect Expressiveness	.02	.16				.00
Negative Affect Expressiveness	.38	.32			.07***	.03
Social Competence	.08	.03			(.01*)	.07**

*p <.05, **p <.01, ***p <.001

Prediction of Intensity of Harmony by Demographics. Table 10d reports on the

role of demographic characteristics of dyads (i.e., age and sex composition) as predictors

of intensity of harmony. Results yielded partial support for hypothesis 1; dyads' age was

not associated with intensity of harmony. The results for the association between the

dyads' sex composition being two boys and the intensity of harmony was the opposite of

what was predicted in the hypothesis. More specifically, boy-dyads had significantly

greater intensity of harmony, whereas there was not an association between the sex

composition having one or two girls and the intensity of harmony, thereby not supporting

the hypothesis.

Further, there was an interaction effect of age and sex composition with two boys.

It was assumed either that older children would have a higher intensity of harmony and

that the prediction would differ depending on the sex composition of dyads, or that sex

composition being two-girls would have a higher intensity of harmony and that the

prediction would differ depending on the age of dyads. Follow-up analysis to calculate

the simple intercept and slope for the significant interaction provided no significant

support for the interaction hypothesis. The association between age and intensity of

harmony did not differ depending on the sex composition of dyads ($B = .05$, $SE = .05$, $p >$

.05 for girl-dyads and mixed-dyads; $B = -.17$, $SE = .12$, $p > .05$ for boy-dyads) and the

association between sex composition and intensity of harmony did not differ depending

on the age of the dyads ($B = .08$, $SE = .27$, $p > .05$ for younger dyads; $B = -.03$, $SE = .32$,

$p > .05$ for older dyads) either (Figure 2).

Children's trait-like frequency of conflicted behavior (i.e., conflict outside of the dyadic relationship) and positive affect expressiveness were associated with higher intensity of dyadic harmony, whereas children's tendency toward more frequent harmony in general and negative affect expressiveness were associated with lower intensity of harmony in specific dyadic relationship. Although sex composition being two boys uniquely predicted intensity of harmony above and beyond the behavioral tendencies and socio-emotional characteristics of dyads, the model with age and sex composition taken together accounted for no significant prediction on intensity of harmony. The full set of predictors in this model explained 4% of the variance in dyadic intensity of harmony. Thus, a tendency to have conflicted relationship in other dyadic relationships and greater positive affect expressed in their relationship as well as dyadic sex composition of two boys were associated with greater intensity of harmony while a tendency to have harmonious relationship in other dyadic relationships and greater negative affect expressed in their relationship were associated with lower intensity of harmony in their specific dyadic relationships.

Table 10d.

Regression on Intensity of Harmony using Demographic Characteristics of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1580)

	Intensity of Harmony					
	B	*SEB*	*β*	*df*	*R² (ΔR²)*	*B* final step
Step1: Demographics				3	.00 (.00)	
Age (A)	.02	.03	.02			.05
Sex Composition1 (S1)	.06	.04	.04			.00
Sex Composition2 (S2)	.06	.03	.06*			.37*
Step2: Interaction Controls				5	.01*	
A x S1	.04	.08	.10		(.00)	.06
A x S2	-.13	.06	-.39*			-.34
Step3: Behavioral Controls				7	.02***	
Out-Dyad Conflict Frequency	.41	.15	.07**		(.01***)	.10***
Out-Dyad Harmony Frequency	-.49	.11	-.12***			-.17***
Step4: Socio-Emotional Controls				10	.04***	
Positive Affect Expressiveness	.61	.16			(.01***)	.11***
Negative Affect Expressiveness	-.94	.34				-.07**
Social Competence	.00	.03				.00

*p <.05, **p <.01, ***p <.001

Figure 2a.

Interaction of Age and Sex Composition 2 on Intensity of Harmony at Value of Sex
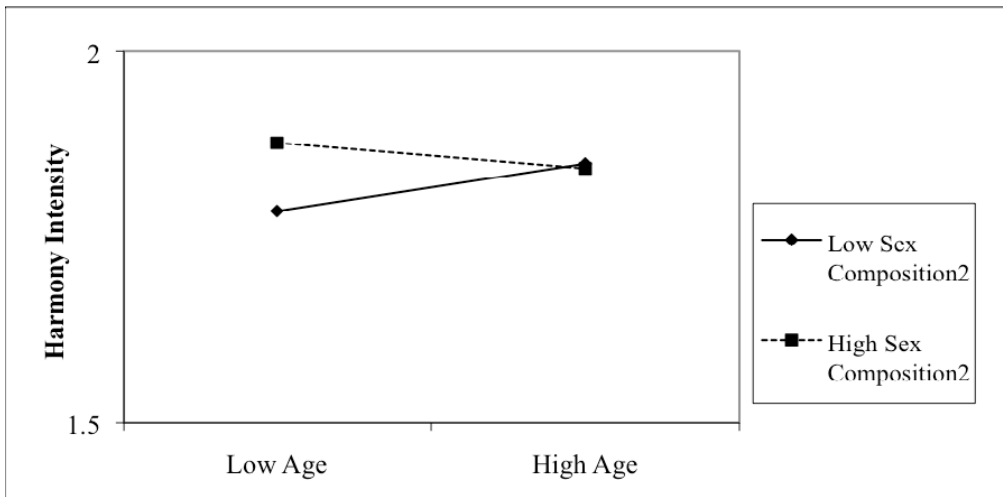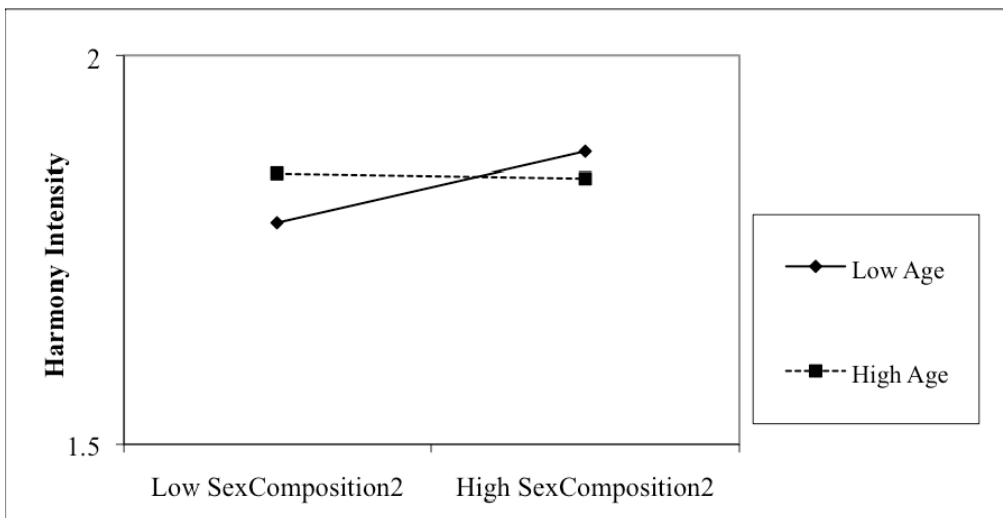
Composition 2

Figure 2b.

Interaction of Age and Sex Composition 2 on Intensity of Harmony at Value of Age

Prediction of Frequency of Conflict by Relationship Statuses. Table 11a reports on the role of relationship statuses (i.e., friendship and dominance) as predictors of frequency of conflict. Results yielded support for hypothesis 2; specifically, the main effect of friendship status predicted the frequency of conflict at the initial step and the model with age and sex composition taken together accounted for small significant prediction on frequency of conflict. Friendship and dominance composition did not predict variance in frequency of conflict.

The full set of predictors in this model explained 15% of the variance in dyadic frequency of conflict. Although main effects of friendship faded away when the behavioral and socio-emotional characteristics of dyads were included, friendship and dominance jointly had small but significant contribution in prediction of frequency of conflict.

Table 11a.

Regression on Frequency of Conflict using Relationship Statuses of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)

	Frequency of Conflict					
	B	SEB	β	df	$R^2 (\Delta R^2)$	B final step
Step1: Relationship Status				2	.01***	
Friendship (F)	.03	.01	.10***			-.11
Dominance (D)	.01	.01	.03			-.01
Step2: Interaction Control				3	.01***	
F x D	.03	.02	.18		(.00)	.16
Step3: Behavioral Controls				5	.14***	
Out-Dyad Conflict Frequency	.90	.06	.37**		(.13***)	.35***
Out-Dyad Harmony Frequency	-.01	.04	-.01			.02
Step4: Socio-Emotional Controls				8	.15***	
Positive Affect Expressiveness	-.07	.06			(.00)	-.03
Negative Affect Expressiveness	.32	.13				.06*
Social Competence	.01	.01				.02

*p <.05, **p <.01, ***p <.001

Prediction of the Frequency of Harmony by Relationship Statuses. Table 11b reports on the role of relationship statuses of dyads (i.e., friendship and dominance) as predictors of frequency of harmony. Results yielded no support for hypothesis 2; specifically, neither main effects at initial step nor interaction effects of friendship and dominance were found in prediction of frequency of harmony. However, dominance was negatively associated with frequency of harmony after behavioral and socio-emotional characteristics of dyads were included at the last step. Dyads with equal power tended to engage in harmony less frequently. The full set of predictors including covariates in this model explained 22% of the variance in dyadic frequency of harmony owing a majority of explanation of variance to the behavioral and socio-emotional characteristic variables of dyads.

Table 11b.

Regression on Frequency of Harmony using Relationship Statuses of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)

	Frequency of Harmony					
	B	SEB	β	df	R^2 (ΔR^2)	B final step
Step1: Relationship Status				2	.00	
Friendship (F)	-.00	.01	-.01			-.01
Dominance (D)	-.01	.01	-.02			-.06*
Step2: Interaction Control				3	.00 (.00)	
F x D	.03	.02	.12			.03
Step3: Behavioral Controls				5	.21***	
Out-Dyad Conflict Frequency	-.03	.07	-.01		(.21***)	-.00
Out-Dyad Harmony Frequency	.96	.05	.46***			.41***
Step4: Socio-Emotional Controls				8	.22***	
Positive Affect Expressiveness	.25	.07			(.01)	.08**
Negative Affect Expressiveness	-.13	.15				-.02
Social Competence	.04	.01				.06**

*p <.05, **p <.01, ***p <.001

Prediction of Intensity of Conflict by Relationship Statuses. Table 11c reports on the role of relationship statuses of dyads (i.e., friendship and dominance) as predictors of intensity of conflict. Results yielded support for hypothesis 2; the model with friendship and dominance taken together accounted for small significant prediction on intensity of conflict. Further, dyads' dominance was positively associated with intensity of conflict and the association remained at the final step. More specifically, dyads with established dominance reported significantly higher intensity of conflict than dyads whose dominance was not established or who had equality. However, neither the main effect of friendship nor the interaction of friendship and dominance statuses predicted intensity of conflict. The full set of predictors in this model explained 7% of the variance in dyadic intensity of conflict. Further, dominance predicted intensity of conflict above and beyond the behavioral and socio-emotional characteristics of dyads.

Table 11c.

Regression on Intensity of Conflict using Relationship Statuses of Dyads with Trait-like (Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads (Listwise N= 1369)

	Intensity of Conflict					
	B	SEB	β	df	R² (ΔR²)	B final step
Step1: Relationship Status				2	.01**	
Friendship (F)	.00	.02	.00			.09
Dominance (D)	.08	.03	.09**			.14***
Step2: Interaction Control				3	.01**	
F x D	-.06	.04	-.17		(.00)	-.15
Step3: Behavioral Controls				5	.07***	
Out-Dyad Conflict Frequency	.44	.14	.09**		(.06***)	.08**
Out-Dyad Harmony Frequency	-.92	.10	-.26***			-.26***
Step4: Socio-Emotional Controls				8	.07***	
Positive Affect Expressiveness	.01	.15			(.01**)	.00
Negative Affect Expressiveness	.45	.31				.04
Social Competence	.09	.03				.08**

*p <.05, **p <.01, ***p <.001

Prediction of Intensity of Harmony by Relationship Statuses. Table 11d reports on the role of relationship statuses of dyads (i.e., friendship and dominance) as predictors of intensity of harmony. Results yielded support for hypothesis 2; the model with friendship and dominance taken together accounted for small significant prediction on intensity of harmony. Dyads' friendship status was positively associated with intensity of harmony, however the association did not remain at the final step. Dyads who were identified as friends by two teachers had significantly higher intensity of harmony than dyads who were not identified as friends or who were identified as friends by only one teacher. Neither the main effect of dominance nor the interaction effect of friendship and dominance statuses predicted intensity of harmony. The full set of predictors in this model explained 4% of the variance in dyadic intensity of harmony.

Table 11d.

Regression on Intensity of Harmony using Relationship Statuses of Dyads with Trait-like

(Out-Dyad) Interactive Behavioral and Socio-Emotional Characteristics of Dyads

(Listwise N= 1580)

	Intensity of Harmony					
	B	SEB	β	df	R^2 $(\varDelta R^2)$	B final step
Step1: Relationship Status				2	.01**	
Friendship (F)	.06	.02	.08**			.25
Dominance (D)	-.04	.03	-.04			-.02
Step2: Interaction Control				3	.01**	
F x D	-.06	.04	-.14		(.00)	-.20
Step3: Behavioral Controls				5	.02***	
Out-Dyad Conflict Frequency	.42	.15	.07**		(.01***)	.09***
Out-Dyad Harmony Frequency	-.40	.11	-.10***			-.16***
Step4: Socio-Emotional Controls				8	.04***	
Positive Affect Expressiveness	.63	.16			(.02***)	.11***
Negative Affect Expressiveness	-.97	.34				-.07**
Social Competence	-.01	.03				-.01

*p <.05, **p <.01, ***p <.001

Independent Prediction of Conflict Frequency by Relationship Statuses

controlling for Demographics, Interaction Effect of Demographics and Relationship

Status, Behavioral Tendency, and Socio-Emotional Characteristics of Dyads. Analyses

that included dyads' relationship statuses (i.e., friendship and dominance) as predictors of

frequency of conflict yielded support for hypothesis 3 (Table 12a). The joint prediction of

friendship and dominance on frequency of conflict was significant. Friendship

significantly predicted conflict frequency as main effect, but and the prediction of

friendship on frequency of conflict did not remain significant at the last phase after all

control variables were included. Among four interaction effect variables, one interaction

effect, age and dominance, was found significant at the entry level and remained as a

significant predictor for conflict frequency at the last step. The follow-up analysis to

calculate the simple intercept and slope for significant interactions tested two possible

moderation effects: the association between dominance and conflict frequency moderated

by age; the association between age and conflict frequency moderated by dominance

status. The result indicated that the association between age and frequency of conflict did

not differ depending on dominance status of dyads ($B = -.02$, $SE = .06$, $p > .05$ for dyads

with established dominance; $B = -.03$, $SE = .08$, $p > .05$ for dyads with not-established

dominance) and the association between dominance and frequency of conflict did not

differ depending on age of dyads ($B = -.01$, $SE = .06$, $p > .05$ for younger dyads; $B = .04$,

$SE = .08$, $p > .05$ for older dyads) for dyads with not-established dominance) either

(Figure 3). In spite of there being no main effect of relational variables remained

significant after all control variables were included, there was unique prediction by

interaction of age and dominance above and beyond demographic, behavioral, and socio-emotional characteristic variables in prediction of frequency of conflict.

Table 12a.

Regression on Frequency of Conflict using Relational Status of Dyads Controlling for Demographics, Interactions of Demographic and Relational, Trait-like (Out-Dyad) Behavioral, and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)

	Frequency of Conflict					
	B	SEB	β	df	R^2 (ΔR^2)	B final step
Step1: Relationship Status				2	.01***	
Friendship (F)	.03	.01	.10***			-.14
Dominance (D)	.01	.01	.03			-.32
Step2: Demographic Controls				5	.03***	
Age (A)	.05	.01	.10***		(.02***)	-.14
Sex Composition 1 (S1)	-.03	.02	-.05*			-.05
Sex Composition 2 (S2)	.02	.01	.04			.01
Step3: Interaction Controls				9	.04***	
A x F	.01	.02	.14		(.01**)	.15
A x D	.09	.02	.70***			.38*
S1 x F	.01	.02	.02			.03
S2 x F	.02	.02	.05			.04
Step4: Other Controls				14	.15***	
Out-Dyad Conflict Frequency	.82	.06			(.12***)	.33***
Out-Dyad Harmony Frequency	.02	.05				.01
Positive Affect Expressiveness	-.10	.07				-.04
Negative Affect Expressiveness	.40	.13				.07**
Social Competence	.01	.01				.03

*p <.05, **p <.01, ***p <.001

Figure 3a.

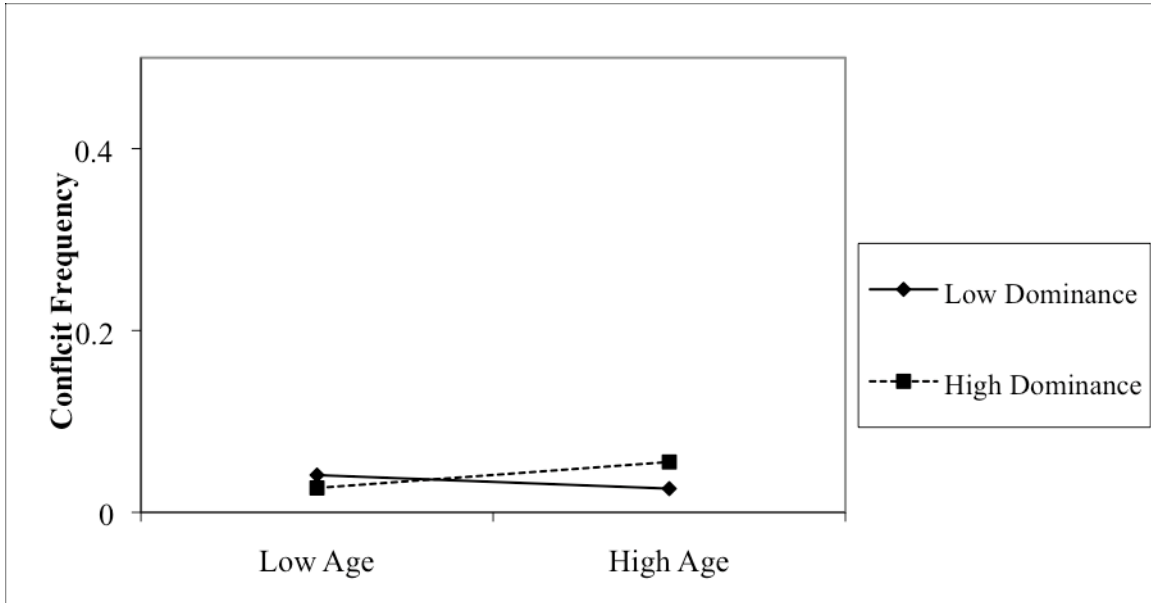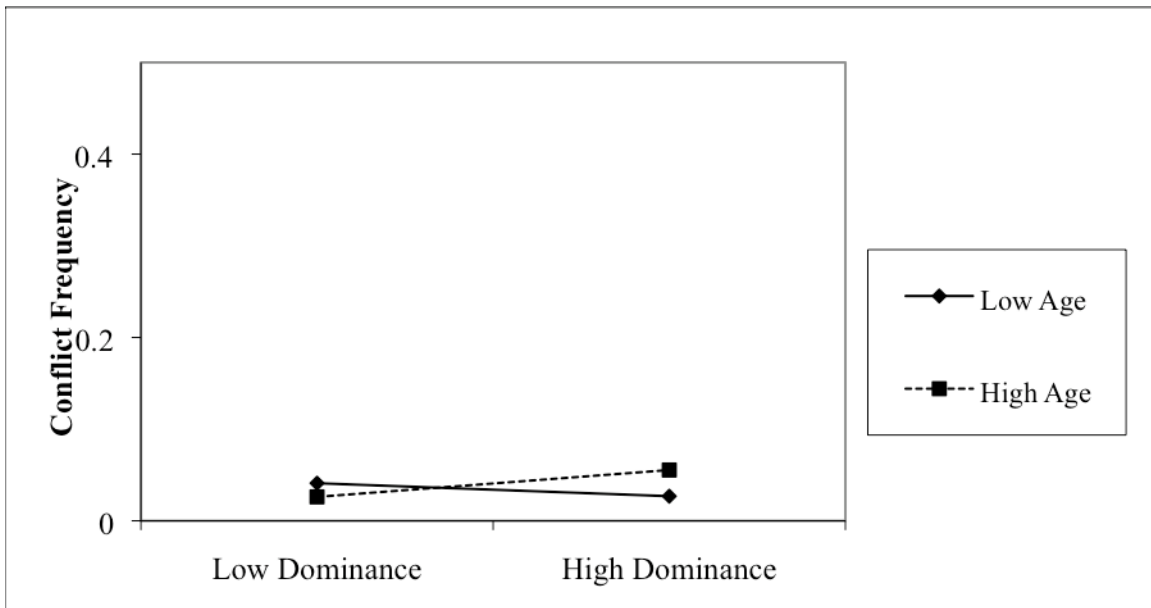*Interaction of Age and Dominance on Frequency of Conflict at the Value of Dominance*

Figure 3b.

Interaction of Age and Dominance on frequency of Conflict at the Value of Age

Independent Prediction of Harmony Frequency by Relationship Statuses

controlling for Demographics, Interaction Effect of Demographics and Relationship

Status, Behavioral Tendency, and Socio-Emotional Characteristics of Dyads. Dyads'

friendship status predicted frequency of harmony independently from the other covariates

whereas dominance status was not associated with frequency of harmony both at initial

step and the last step. The finding partially supports for hypothesis 3 (Table 12b). Friends

tended to engage in more frequent harmony regardless their other dyadic characteristics

or average of dyadic scores (i.e., age, dyadic sex composition, a behavioral tendency to

have conflicted or harmonious interaction in other dyadic relationships, and positive or

negative affect expressed in their relationship as well as their dyadic social competence

level). Two interaction effects, age x friendship and age x dominance were found as

significant predictors for frequency of harmony at the initial step, however only

interaction of age and friendship remained as significant predictor for harmony frequency

at the last step.

The interaction effect of age and friendship on harmony frequency was detected

in follow-up analysis. The follow-up analysis to calculate the simple intercept and slope

for significant interactions tested two possible moderation effects by age (i.e., prediction

by friendship differs depending on age of dyads) and by friendship status (i.e., prediction

by age differs depending on friendship status). The result indicated that the association

between age and frequency of harmony differed depending on friendship status of dyads

($B = -.02$, $SE = .05$, $p > .05$ for non-friends; $B = -.07$, $SE = .05$, $p > .05$ for friends

identified by one teacher; $B = -.11$, $SE = .05$, $p < .05$ for friends identified by two

teachers). Older children had less frequency of harmony and that was true for dyads who

were identified as friends by two teachers. However, the association between friendship and frequency of harmony did not differ depending on age of dyads ($B = .02$, $SE = .11$, $p > .05$ for younger dyads; $B = -.03$, $SE = .16$, $p > .05$ for older dyads) (Figure 4). The result indicated that the association between age and frequency of harmony differed depending on dominance status of dyads ($B = .05$, $SE = .05$, $p > .05$ for dyads with equal power; $B = .21$, $SE = .06$, $p < .001$ for dyads with established dominance). Older children had more frequency of harmony and that was true for dyads with established dominance. The association between dominance and frequency of harmony differed depending on age of dyads ($B = -.07$, $SE = .03$, $p < .01$ for younger dyads; $B = .09$, $SE = .03$, $p < .01$ for older dyads) (Figure 5). Dyads with established dominance had more frequent harmony and that was true for both younger and older dyads. However, this interaction effect did not exist independently from all other behavioral and socio-emotional characteristics of dyads were included. Overall, in spite of no independent main effect of relational variables, friendship status predicted frequency of harmony independently from the other variables.

Table 12b.*Regression on Frequency of Harmony using Relational Status of Dyads Controlling for Demographic, Interactions of Demographic and Relational, Trait-like (Out-Dyad) Behavioral, and Socio-Emotional Characteristics of Dyads (Listwise N= 1784)*

	Frequency of Harmony					
	B	SEB	β	df	$R^2 (\Delta R^2)$	B final step
Step1: Relationship Status				2	.00	
Friendship (F)	-.00	.01	-.01			.42**
Dominance (D)	-.01	.01	-.02			-.23
Step2: Demographic Controls				5	.05***	
Age (A)	.12	.01	.19***		(.04***)	-.03
Sex Composition 1 (S1)	.07	.02	.10***			.08**
Sex Composition 2 (S2)	-.01	.02	-.01			-.00
Step3: Interaction Controls				9	.07***	
A x F	-.07	.02	-.61***		(.02***)	-.43**
A x D	.16	.03	.11***			.21
S1 x F	-.02	.02	-.04			-.02
S2 x F	.03	.02	.05			.04
Step4: Other Controls				14	.22***	
Out-Dyad Conflict Frequency	.00	.07			(.16***)	.00
Out-Dyad Harmony Frequency	.83	.06				.39***
Positive Affect Expressiveness	.24	.08				.08**
Negative Affect Expressiveness	-.17	.15				-.02
Social Competence	.04	.01				.06**

*p <.05, **p <.01, ***p <.001

Figure 4a.

Interaction of Age and Friendship on Frequency of Harmony at Value of Friendship
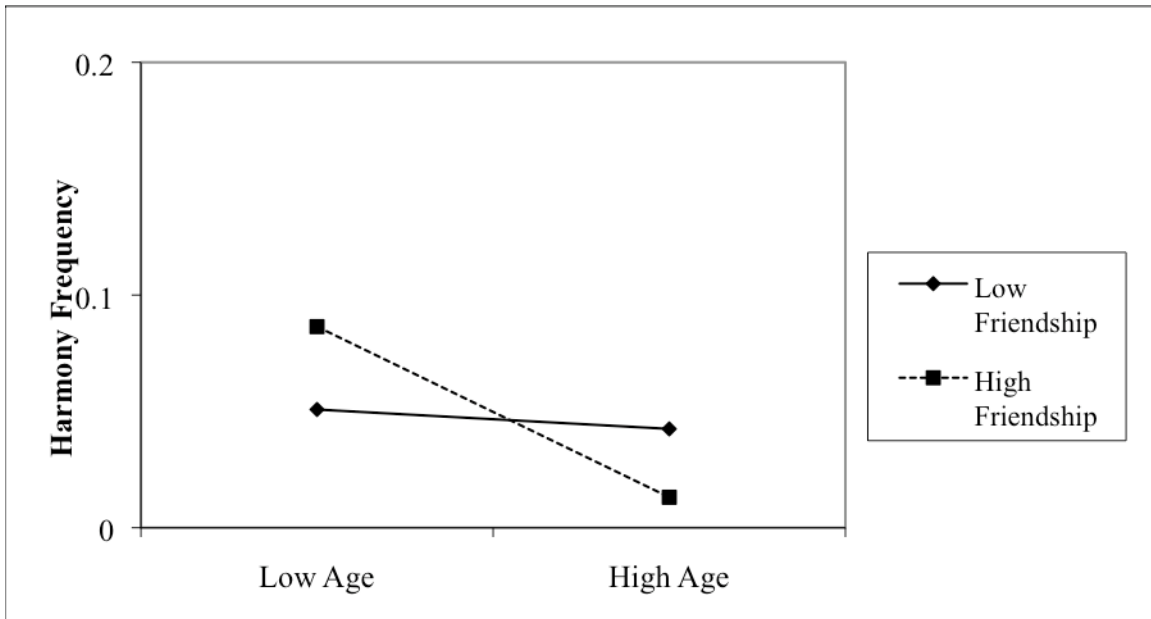

Figure 4b.

Interaction of Age and Friendship on Frequency of Harmony at Value of Age
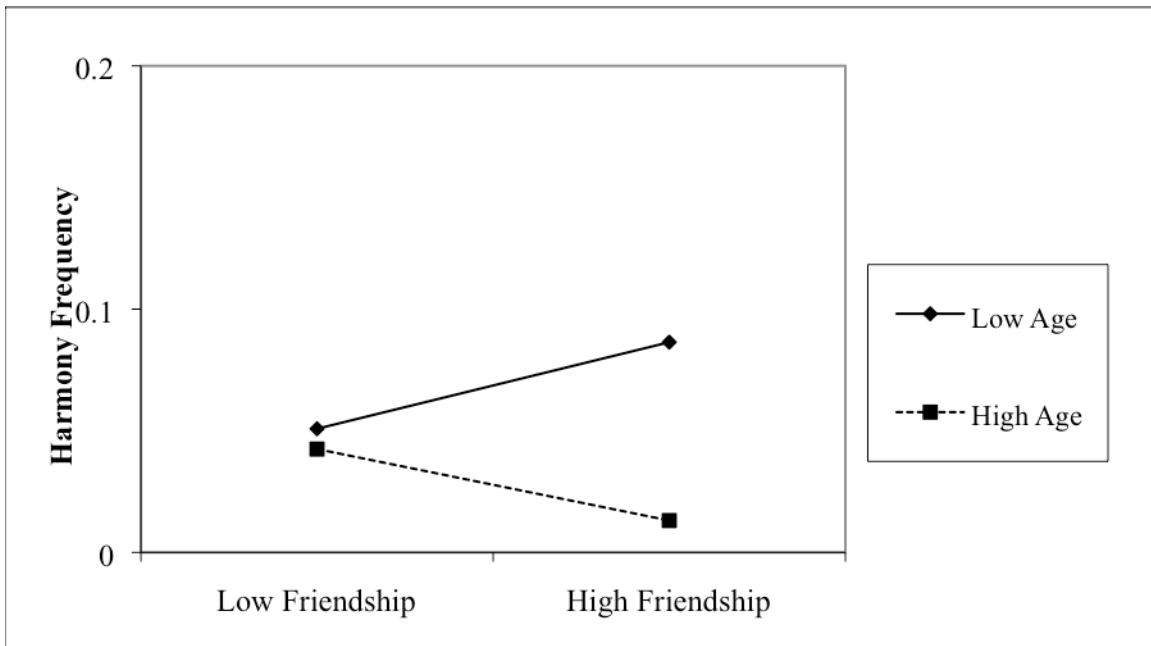
Figure 5a.

Interaction of Age and Dominance on Frequency of Harmony at Value of Dominance
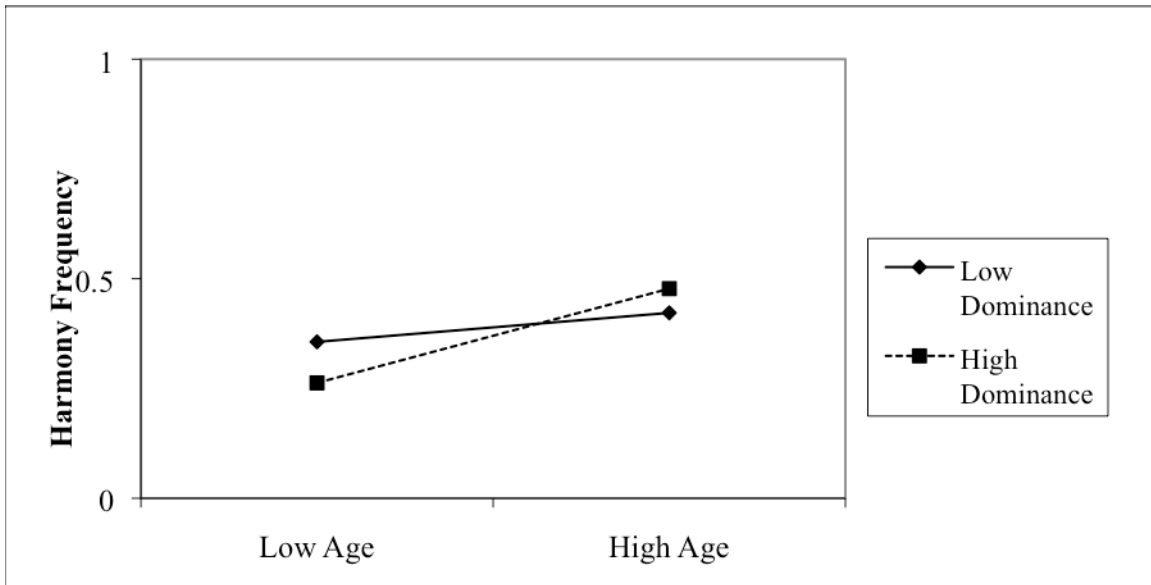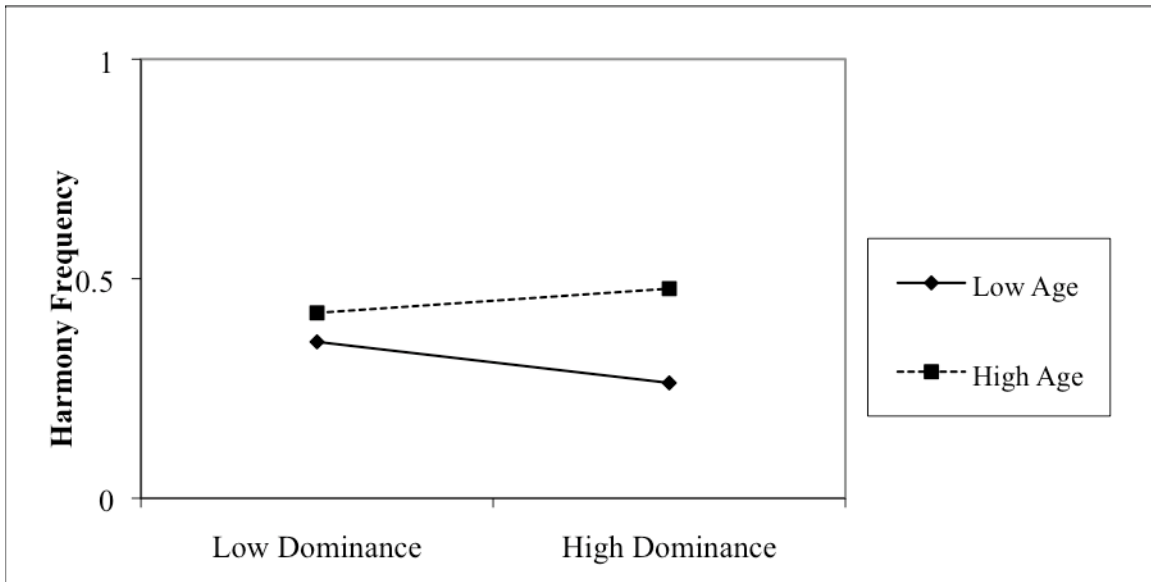

Figure 5b.

Interaction of Age and Dominance on Frequency of Harmony at Value of Age

Independent Prediction of Conflict Intensity by Relationship Statuses controlling

for Demographics, Interaction Effect of Demographics and Relationship Status,

Behavioral Tendency, and Socio-Emotional Characteristics of Dyads. Analyses that

included dyads' relationship statuses as predictors of conflict intensity yielded support for

hypothesis 3 (Table 12c). Relationship statuses were jointly associated with intensity of

conflict. Dominance significantly predicted conflict intensity independently and the

prediction remained significant after all control variables (i.e., behavioral and socio-

emotional characteristics control variables as well as interaction of demographics and

relationship status of dyads) were included.

Among the four interaction effect variables, one interaction effect, age and

dominance, was found significant in prediction of conflict intensity but did not predict the

variance in conflict intensity above and beyond behavioral and socio-emotional

characteristics of dyads. The follow-up analysis to calculate the simple intercept and

slope for significant interactions tested two possible moderation effects by dominance

status (i.e., prediction by age differs depending on dominance status) and by age (i.e.,

prediction by dominance differs depending on age of dyads). The result indicated that the

association between age and conflict intensity did not differ depending on dominance

status of dyads ($B = -.02$, $SE = .18$, $p > .05$ for dyads with equal power; $B = -.10$, $SE =$

$.37$, $p > .05$ for dyads with established power). Neither did the association between

friendship and frequency of harmony differ depending on age of dyads ($B = .14$, $SE =$

$.39$, $p > .05$ for younger dyads; $B = .06$, $SE = .14$, $p > .05$ for older dyads) (Figure 6).

Overall, there was significant relationship effect in prediction of conflict intensity and

dyads with established dominance tended to engage in more intense conflict regardless

their age, dyadic sex composition, behavioral tendencies having conflict or harmony in other dyadic relationships, as well as their dyadic average scores of affect expressiveness and of social competence).

Table 12c.

Regression on Intensity of Conflict using Relational Status of Dyads Controlling for

Demographic, Interactions of Demographic and Relational, Trait-like (Out-Dyad)

Behavioral, and Socio-Emotional Characteristics of Dyads (Listwise N= 1369)

	Intensity of Conflict					
	B	SEB	β	df	$R^2 (\Delta R^2)$	B final step
Step1: Relationship Status				2	.01**	
Friendship (F)	-.00	.02	-.00			-.30
Dominance (D)	.08	.03	.09**			.39*
Step2: Demographic Controls				5	.03***	
Age (A)	-.12	.03	-.13***		(.02***)	.06
Sex Composition 1 (S1)	-.02	.04	-.01			.03
Sex Composition 2 (S2)	.07	.03	.06*			.05
Step3: Interaction Controls				9	.04***	
A x F	.06	.04	.33		(.01*)	.26
A x D	-.18	.06	-.71**			-.32
S1 x F	-.02	.05	.02			-.03
S2 x F	.00	.04	.00			.01
Step4: Other Controls				14	.08***	
Out-Dyad Conflict Frequency	.41	.15			(.05***)	.08**
Out-Dyad Harmony Frequency	-.86	.12				-.24***
Positive Affect Expressiveness	.07	.16				.01
Negative Affect Expressiveness	.40	.32				.04
Social Competence	.09	.03				.08**

*p <.05, **p <.01, ***p <.001

Figure 6a.

Interaction of Age and Dominance on Intensity of Conflict at Value of Dominance
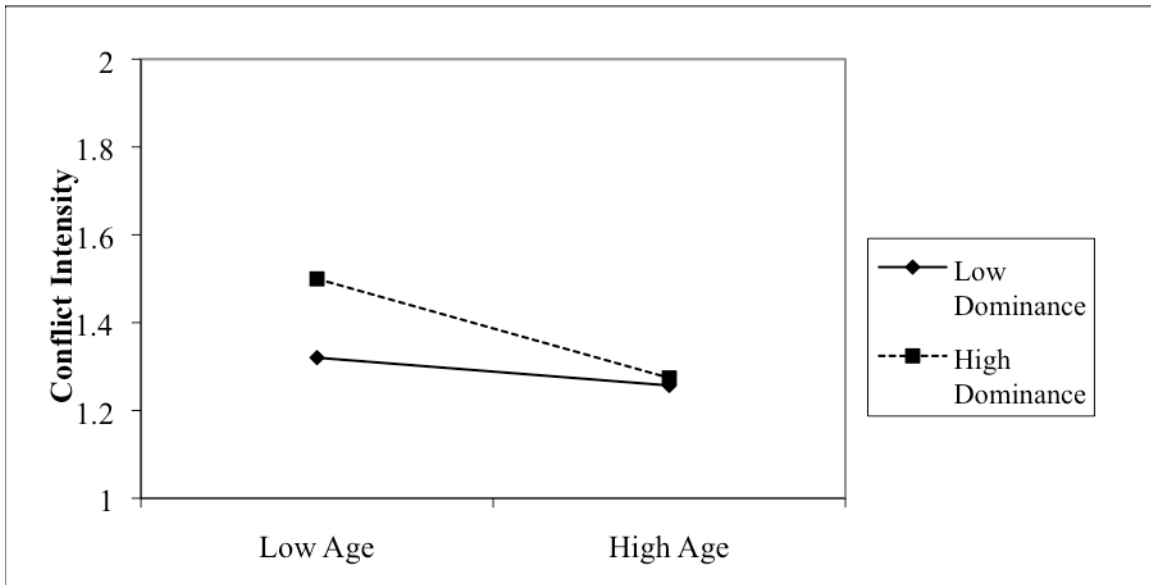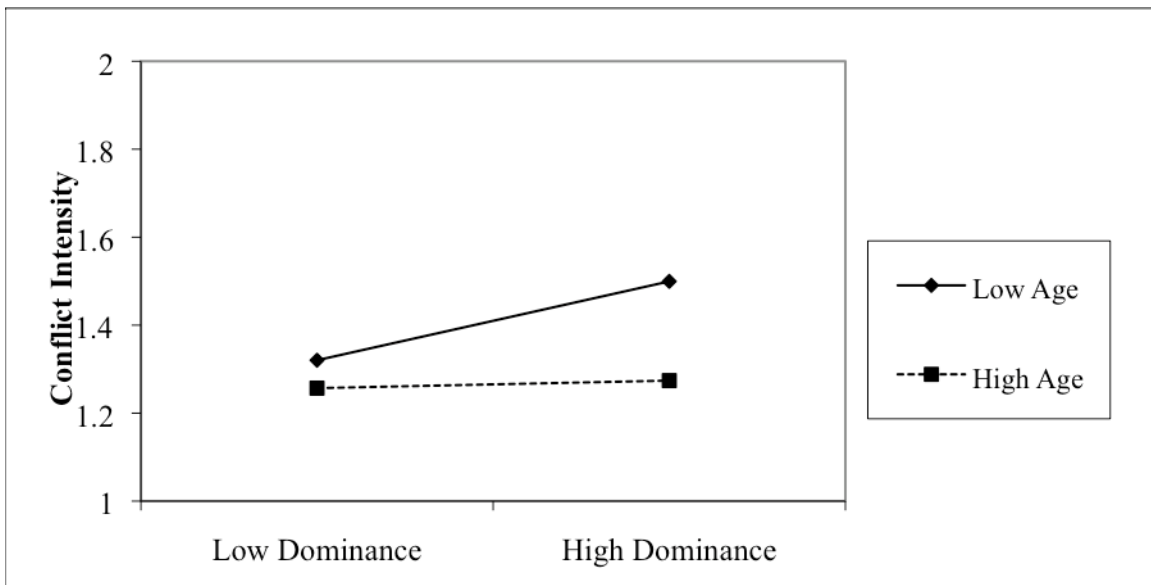

Figure 6b.

Interaction of Age and Dominance on Intensity of Conflict at Value of Age

Independent Prediction of Harmony Intensity by Relationship Statuses controlling

for Demographics, Interaction Effect of Demographics and Relationship Status,

Behavioral Tendency, and Socio-Emotional Characteristics of Dyads. Analyses that

included dyads' relationship statuses (i.e., friendship and dominance) as predictors of

intensity of harmony yielded support for hypothesis 3 (Table 12a). Relationship statuses

were jointly associated with intensity of conflict. Friendship significantly predicted

conflict intensity independently at the initial step, however the prediction did not exist

after all control variables (i.e., behavioral and socio-emotional characteristics control

variables as well as interaction of demographics and relationship status of dyads) were

included. There was no significant interaction effect in prediction of harmony intensity.

Overall, there was significant relationship status effect in prediction of harmony intensity

and dyads with established friendship tended to engage in more intense harmony but

friendship did not predict intensity of harmony above and beyond behavioral and socio-

emotional characteristics as well as interaction effect variables that majorly predicted

harmony intensity.

Table 12d.

Regression on Intensity of Harmony using Relational Status of Dyads Controlling for Demographic, Interactions of Demographic and Relational, Trait-like (Out-Dyad) Behavioral, and Socio-Emotional Characteristics of Dyads (Listwise N= 1580)

	Intensity of Harmony					
	B	*SEB*	*β*	*df*	*R² (ΔR²)*	*B* final step
Step1: Relationship Status				2	.01**	
Friendship (F)	.06	.02	.08**			-.02
Dominance (D)	-.04	.03	-.04			-.08
Step2: Demographic Controls				5	.01*	
Age (A)	.02	.03	.02		(.00)	-.02
Sex Composition 1 (S1)	.04	.04	.03			.04
Sex Composition 2 (S2)	05	.03	.05			.04
Step3: Interaction Controls				9	.01	
A x F	.02	.04	.10		(.00)	.09
A x D	-.01	.06	-.04			.06
S1 x F	.02	.05	.02			.01
S2 x F	-.03	.04	-.03			-.03
Step4: Other Controls				14	.04***	
Out-Dyad Conflict Frequency	.53	.16			(.03***)	.09**
Out-Dyad Harmony Frequency	-.68	.13				-.17***
Positive Affect Expressiveness	.63	.16				.11***
Negative Affect Expressiveness	-.94	.34				-.07**
Social Competence	-.01	.03				-.01

*p <.05, **p <.01, ***p <.001

DISCUSSION

Interactions and relationships among members of a dyad mutually influence one another. Interactions play a role in formation of social relationships and relationships in turn direct the nature of interactions between the dyadic members (see Ross, Conant, Cheyne, & Alevisos, 1992; Rubin, 1999). As a consequence, relationship attributes may interact with the individual characteristics of the dyad members in the context of their play, and the characteristic modes/qualities of dyadic interactions can change (Rubin, 1999). The aims of the study were derived from knowledge of the association between the quality of interactions and interpersonal endogenous factors (i.e., behavioral characteristics, affect expressiveness, and social competence) and exogenous factors (i.e., sex composition, friendship, and dominance) combined with an appreciation of the compatibility of prosocial and agonistic patterns of interaction (i.e., conflict and harmony are not the ends of one continuum). This study tested each of the factors that might influence the quality of interaction of preschool children in terms of examining whether and how a given factor determines interaction quality while controlling the other factors.

To advance our understanding of interaction qualities and interpersonal characteristics requires increased complexity of analytic design to test whether and how much relationship status (e.g., friendship, dominance) contributes to dyadic behavior over and above demographic status (e.g., age, sex) and individual level behavioral traits (e.g., social competence). Thus, the current study aimed to investigate the relationship influences on dyadic interactions among preschool age children, particularly, to determine whether two dyadic relationship parameters, friendship and dominance, contributed significantly to harmonious and conflicted interactions within dyads of young

89

children. To show whether these relationship status indicators are making unique, significant contributions to these dyadic level interaction variables, multiple control variables were included, namely, behavioral, demographic, and socio-emotional characteristics.

Although the correlations tended to be modest, the associations between relationship status variables and dyadic interaction qualities were consistent with notions that relationships create special circumstances in which relatively better quality interactions are possible. Furthermore, the data suggested that both conflict and harmony were influenced by other intrapersonal and interpersonal characteristics as well as in established relationships. Basically, the analyses were designed to test the proposition that relationships can count for significant components of variance over and above demographic status variables and intrapersonal characteristics. Further, dependencies among the demographic and relationship variables (i.e., significant associations between age and friendship, age and dominance, sex composition of the dyad and friendship, friendship and dominance) required considerations of interaction effects in the analyses.

Demographic characteristics of dyads were associated with frequency and intensity of interaction qualities. Age was a significant predictor of frequency and intensity of interactions as expected. Older children engaged in both conflicted and harmonious interaction more frequently than younger children. This finding supports the existing assumptions derived from Piagetian (for frequency of conflict) and Vygotskian (for frequency of harmony) theories about children's development. As children mature cognitively, there is an increase in differences of opinion and problem solving skills, provoking more frequent conflicted interaction as well as more frequent harmonious

cooperation. This finding is consistent with Parten's (1932) research as well in which children tended to enjoy peer interaction more as they become older, transitioning from nonsocial types of play (solitary and parallel) to social types of play (associative and cooperative). Thus, older preschoolers could have more peer-engaged interaction than younger ones, and thus more chances for both conflicted and harmonious interaction than their younger counterparts. As previous findings in the field (NICHD, 2001; Rubin et al., 1998) suggest, the analyses demonstrated that conflict is relatively common among young children's interactions and is often observed in children who are socially initiating and actively engaging in peer interaction.

However despite the increased frequency of conflicted exchanges for older children, their conflicts tended to be less intense than those for younger children. This finding supports the exploratory hypothesis that age is negatively associated with intensity of conflict. The negative association between age and intensity of conflict suggests that intensity may be a different parameter of interaction that can be distinguished from interaction frequency. Because social competence increases with age (e.g., Shin et al., in press), it was anticipated that the relation between dyadic conflict and social competence would follow the same pattern shown by age (i.e., a negative relation). This discordant finding was resulted from the how social competence scores were derived. Since social competence per se cannot be correlated with age because all indicators of social competence was standardized within age level, so it is most likely not to have the same pattern for social competence and age. To be more accurate, social competence and intensity correlation should be assessed separately for older and younger children. Further, social competence score in this study is dyadic score that is the average

of the two members' scores. Thus it is not clear how social competence should relate to conflict and harmony and it may depend on the difference within the dyad for social competence, not the average score, and that justifies further investigation on this issue.

Sex composition of dyads was associated with both conflict and harmony. Girl-dyads were engaged in harmonious interaction more frequently than boy-dyads or mixed dyads whereas boy-dyads tended to experience more frequent and more intense conflict than girl-dyads or mixed dyads, as anticipated. This finding corresponds to previous research (see Lu, 1998; Smith & Inder, 1993) suggesting sex differences in peer interaction. According to the previous research on sex differences, girl-dyads tend to show fewer aggressive exchanges in interaction and to engage in covert rather than overt aggressiveness with peers.

Expectedly, the sex composition of dyads was associated with intensity of harmony. Before covariates (i.e., out-dyad frequency of conflict and harmony, positive and negative affect expressiveness, and social competence) were controlled, boy-dyads, rather than girl-dyads, were found to have greater intensity of harmony in their interactions and this association remained after all covariates were controlled. Sex composition predicted intensity of harmony above and beyond the other interpersonal characteristics.

Relationship status of dyads was associated with frequency and intensity of interaction qualities. The data suggest that friends engaged in conflict more frequently than non-friends and that friends experienced intense harmony in dyadic interactions, thereby adding to previous research findings that preschool-aged friends have more coordinated play as well as more interdependence than non-friends (see Parker &

92

Gottman, 1989). The relation between friendship and conflict frequency was no longer significant after covariates were controlled, however, the significant association between friendship and the intensity of harmonious interactions was robust, even after all covariates were included in the prediction equation. One would expect that friends are better in managing conflict-eliciting situations. They are better in yielding toys or roles and better in negotiation. Thus, it should typically take a short time for friends to come up with a solution that is satisfying to both friends (e.g., taking turns or sharing) so they eventually have more opportunity to engage positively and enjoy the play time more deeply than children who are not friends. However, unexpectedly for this study, friendship did not have significant association with frequency of harmony or intensity of conflict.

Dominance was negatively associated with frequency of harmony and positively associated with intensity of conflict and both associations were contrary to the assumption derived from a recent study on social dominance in preschool children (Vaughn et al., 2003). In other words, dyads with established dominance engaged in less frequent harmony and more intense conflict than dyads with equal power. A possible explanation for discrepancy between this research and previous research could be due to different data structures. One possible explanation resides in how dominance was measured in the two studies. Vaughn et al. (2003) used the individual's rank in the whole classroom, while this study used paired comparisons. An individual child can be either dominant or submissive or equal-powered to the partner in a dyad. Thus, the difference in the child's interactive behavior can be explained as a function of his dominance status within a dyad (i.e., dominant or submissive or equal-powered) as well as whether there is

established dominance between two individuals in a given dyad. Since the variables in this study do not consider the contributions of each individual child, not individual behavior but dyadic attributes explained interaction qualities, therefore, the findings in this study cannot be compared to the previous studies employing individual trait-like dominance (e.g., Vaughn et al., 2003). Thus it is required to consider the gap in different measures between the current and the previous studies in interpreting the findings.

Relationship status predicted interaction qualities of dyads independently from demographics, interactions of demographics and relationship statuses, behavioral dispositions, and socio-emotional characteristics of dyads. Friendship and dominance predicted interaction qualities independently except frequency of harmony. Friendship predicted frequency of conflict and intensity of harmony independently, however, the effect no longer existed with the other interpersonal variables controlled. Interestingly, friendship was not associated with frequency of harmony initially, but it became to predict frequency of harmony when interaction effect of demographic and relationship status were included, and the effect remained significant even after the other interpersonal variables were included. Dominance was associated with intensity of conflict across all the steps of regression, indicating that dominance predicts intensity of conflict not only independently but also jointly with the other interpersonal variables.

Joint effect of demographics and relationship status were found in conflicted interaction. Friendship was associated with frequency of conflict with age and sex composition 1 (i.e., girl-dyads) whereas dominance with intensity of conflict with age and sex composition 2 (i.e., boy-dyads). More specifically, older children, girl-dyads, and

friends engaged in frequency of conflict more often while younger children, boy-dyads, and dyads with established dominance engaged in higher intensity of conflict. The magnitudes of the predictions by these main effect variable compositions above and beyond the trait-like interactive behavioral tendencies, affect expressiveness, and social competence were small but significant except intensity of harmony. This indicates that main effect variables independently predict interaction qualities even when the impact of behavioral and socio-emotional characteristics of dyads were restrained by the social situation.

Two interaction effects (i.e., age x dominance, age x friendship) among the four exploratory hypothesized interaction effects derived from the literature review and examined in the bivariate analysis results were found significant predictors for interaction qualities. Interaction of age and dominance was associated with frequency of conflict in a positive way and with intensity of conflict in a negative way. However, the prediction on intensity of conflict disappeared at the last step of regression table and there was no statistical difference found in prediction of frequency of conflict either by dominance status of dyads between younger and older children groups or by age of dyads between two different dominance groups (i.e., dyads with established dominance vs. dyads with equal power). Only one interaction effect, age and friendship, was found significant in prediction of frequency of harmony as expected.

One possible reason for the fading effect of interaction terms as well as the rest of the (unexpected) non-significant interaction effects concerns collinearity among the main effect variables. For example, as children grow, the robustness of friendship and dominance increases, and same-sex friendship preference increases as well; thus, it may

95

be hard to distinguish the true effect of a main predictor while ruling out potential contamination by the other predictors in the explanation of interaction qualities. Future study will require avoiding or dealing with this collinearity issue in order to obtain the true effects of predictive variables. In spite of the issues above, finding of effects for the relationship variables even after all the control variables seems significant and suggests a rather robust effect of relationship statuses (i.e., it remains when other potential confounds are included in prediction)

Overall, dyads with established dominance engaged in harmonious interaction less frequently and experienced more intense conflicted interaction above and beyond their behavioral, demographic, and socio-emotional characteristics of dyads compared to dyads without established dominance. Dyads with established friendship had more intense harmony than dyads without established friendship, as expected. As a joint main effect, friendship and dominance uniquely predicted intensity of conflict that was not accounted for by the effects of behavioral, demographic, and socio-emotional characteristics of dyads. Hence, friendship seems to be connected to intensity of harmony, and dominance seems to be related to frequency of harmony and intensity of conflict, with the finding for friendship supporting the existing literature, but the finding for dominance having the opposite result of what has been reported previously.

As mentioned above, a possible explanation for the dominance findings in this study is based on the differing data structure for dominance (i.e., teacher rating of paired dominance) compared to previous studies (i.e., observation, group ranking). Another possible reason for the unexpected result is that conflict was defined in terms of negative behavioral expression in dyadic play in this study. This differs from how conflict has

96

been defined in previous research. Since conflict in the present study was defined as negative verbal or physical exchange, and it was observed in dyadic play, the result of analyses could differ from some of previous studies in which forms of conflict included more severe forms of physical aggression that may be destructive to social relationships or in which conflict was considered mutually exclusive of harmonious interaction. Conflict could be either a product of suboptimal coping skills when children faced different ideas or opinions or a process to solve problems or disagreements concerning the course of play. If the definition is narrowed to mean exclusively either a constructive or destructive process, the results of each type of research would differ, or at least the interpretation of differences might become easier. For researchers who are interested in the broad concept of conflict, a highly specific coding system or scales could be useful in studying a variety of aspects of intensity of conflict. In addition to conceptual issue, high intensity (more destructive) conflicts were very rare in the dataset and to gather the relevant data would be very difficult and possibly unethical (that is, to allow a conflict to become very destructive could harm one or the other dyad member).

This study found that intrapersonal characteristics accounted for more of the variance in the interaction qualities than relationship statuses of dyads. There were significant associations between intra- (i.e., trait-like behavioral tendency toward conflicted or harmonious interaction) and inter-personal characteristics (i.e., friendship and dominance) and interaction qualities in addition to the association between age and socio-emotional characteristics (i.e., affect expressiveness and social competence) found in earlier studies (Vaughn, 2001; Vaughn et al., under review). A behavioral trait-like tendency toward conflict was associated with the frequency and intensity of conflict and

intensity of harmony, whereas a behavioral tendency toward harmony was positively associated with the frequency of harmony and negatively associated with intensity of conflict and harmony. In other words, frequency, as expected, was predicted by the same valence of tendency (i.e., conflict tendency on frequency of conflict; harmony tendency on frequency of harmony). However, children having more conflict with other peers in general and children having less harmony with other peers in general engaged in intense interaction regardless the quality of interaction. A possible explanation for this is that the out-dyad scores are obtained in a more reliable way than the within-dyad score. This would come from the fact that the out-dyad scores aggregate information across many partners for each dyad member. Thus, out-dyad scores extend beyond the dyad-specific interaction qualities in a given dyad's play. Overall, although a child's habitual tendencies toward harmonious or conflicted interactions are present, to a degree, in individual exchanges, there was a robust effect of relationship status as well.

This study also found positive associations among socio-emotional characteristics (i.e., positive affect and social competence and harmony). The finding supports previous studies of positive psychology proposing that children with more positive affect expressiveness experience harmonious interaction extending to positive life outcomes such as social acceptance (e.g., preferred by peers) (Frederickson, 2001). It is surprising to find the significant positive associations among positive attributes and among negative attributes because affect scores in this study are dyadic score that is, not an individual affect score but the average of two individuals' affect scores. This finding indicates that where there is more positive affect there is more harmony; likewise, where there is more

conflict there is more negative affect is true not only for an individual but also for individuals in a dyad.

Positive affect expressiveness predicted frequency and intensity of harmonious interaction whereas negative affect expressiveness predicted frequency of conflict and intensity of harmony (in a negative association). Social competence had a positive association with frequency of harmony but also had a positive association with intensity of conflict. A possible reason for this is that children with high social competence would know how to resolve conflict and/or how to avoid conflict situations; thus, they might experience more intense conflict but not engage in frequent conflict, due to their avoidance of, or resolution of, conflict. Another reason for this finding is using a dyadic social competence score without knowing how each child contributes to the dyadic score. It would be useful to know just how much more intense the conflicts of more socially competent children were.

Contributions and Implications. The first contribution of this study to the field of child development is that the present study attempted to employ both endogenous factors (i.e., behavioral disposition, demographic characteristics and socio-emotional characteristics) and exogenous factors (i.e., relationship status, group composition) simultaneously in examining preschool children's relationship qualities. Furthermore, this study has conceptualized and assessed interaction qualities differently from previous studies by combining both horizontal (e.g., friendship, sociometric) and vertical (e.g., dominance, ordering) assessments of relationships. The study contributes to the field by offering empirical support for an alternative perspective that conflict and harmony are not mutually exclusive (i.e., that an exchange can occur simultaneously conflicted and

harmonious). However, it is noted that these qualities may be accurate descriptors of interaction sequences in which some elements indicate conflict and others harmony). This study proposes that conflict and harmony are compatible elements within a relationship, rather than opposite ends of the continuum of interaction quality.

Given that acquisition of positive and socially acceptable procedures for interaction occur within the context of peer groups, and that dyadic peer interactions make a substantial contribution to children's social and emotional development in early childhood years, another key contribution of the current study is the employment of dyads as the unit of analysis, including dyadic categorical independent variables (i.e., dyadic composition of each of age, sex, friendship, and dominance variables), dyadic continuous independent variables (i.e., average of two individual children's scores in trait-like behavioral tendency, affect expressiveness, and social competence), and dependent variables (i.e., dyadic interaction quality scores). The current study employed multiple measurements and informants including direct observation, interviews with children, and rating by teachers as well.

An important approach used in the current study is to account for multilevel data. Children in some dyads shared the same classroom. In order to rule out the effect of classroom factors that may have influenced dyadic relationships, the analyses were tested in a multilevel (nested) framework: the individual level and the classroom level. Multilevel analyses revealed that there was in fact no significant classroom effect, only the individual child's effect on the dyadic interaction quality.

In order to assess whether their interaction within the dyad was different from interactions outside the dyad, the analyses accounted for interaction qualities within the

dyad (i.e., in-dyad) and outside the dyad (i.e., out-dyad). Out-dyad interaction is context-general interaction, that is, a tendency of a child to have conflict/harmony with peers in general, whereas in-dyad interaction is context-specific, that is, the extent to which there is conflict and harmony with a specific playmate in a given dyad. In-dyad and out-dyad levels of interaction were employed in order to see whether they had the same patterns of associations with the independent variables as the in-dyad frequency scores. Since there was a modest correlation between in-dyad and out-dyad scores, the out-dyad scores were treated as behavioral trait-like characteristics of individuals. The average of two out-dyad score was chosen as a dyadic behavioral characteristic score in the study.

Limitations and Future Directions. While the results from the current study contribute to furthering our knowledge about early childhood peer relations and interactions, especially by providing new information about how relationship statuses are associated with preschool children's dyadic interaction qualities and how the relationship statuses predict the interaction qualities above and beyond demographic, behavioral, and socio-emotional characteristics of dyads, there were also several limitations of the present study. First, the current study was limited in ethnic and racial diversity, as approximately 65% of the participants were European American; thus, the findings may not generalize across ethnic and racial groups. Future research should investigate the association between intra- and inter-personal characteristics of preschool children and their dyadic interaction qualities for different ethnic and racial groups.

Furthermore, having done one-time observation of each dyad limits the generalizability of the results and may have introduced some biases in the data, since there is a risk of having uneven conditions for each child under observation, such as

having a toy preferred by one child but not by the other. If there was difference found

between one child's interaction qualities with two different playmates, the difference in

outcome could be attributable not to the main predictors (i.e., age, sex composition,

friendship, or dominance) but to the difference in an individual child's preference for a

given toy or task. If the analyses could control for other features of children's play with

toys or engagement in tasks (e.g., preference level of each child, average level of

cooperation or conflict, turn-taking vs. one child's control of a toy), that potentially

impact the variation of children's engagement with the toy, the interpretation of

differences in interaction qualities across dyads would be more reliable and generalizable.

In addition, combining the analysis of the measures used here with additional

measurements of conflict and harmony (e.g., classroom observation at multiple time

points) would enhance the interpretation of hypotheses.

      The addition of longitudinal data to the cross-sectional data used here might

improve the interpretation by further clarifying whether the difference in children's

interaction qualities was attributable to endogenous factors (i.e., intrapersonal factors,

such as behavioral tendency, affect expressiveness, and social competence) or exogenous

factors (i.e., inter-personal factors, such as sex composition, friendship, dominance) in

that there are age differences found in intrapersonal characteristics (see Shin et al., in

press) and change in interpersonal characteristics (i.e., same sex preference as friends;

sturdier friendship; more stable dominance) as children grow (Berndt, 1981; Jacklin &

Maccoby, 1978; Strayer, 1989). Future research should consider a longitudinal research

design in order to determine the true predictive ability of main effect variables on

interaction qualities while controlling for the time-relevant changes. In addition, a

longitudinal design would inform us about typical directionality and change in interaction qualities of preschool children over time.

In order to develop more comprehensive and detailed maps of the association between intra- and inter-personal characteristics of dyads and interaction qualities in future studies, the following issues require consideration. First of all, there is the question of how best to code for the sex composition of dyads so that features of dyadic interactions and relationships are not lost. In this study, there was no direct finding for mixed sex dyads in terms of their association with interaction qualities since two dummy codes of sex composition allowed the comparison of boy-dyads to girl- and mixed dyads or the comparison of girl-dyads to boy- and mixed dyads. Mixed gender groups, according to the previous research, are more similar to boys' groups in the predominance of boisterousness and use of boy-preferred themes almost as much as groups of boys, but rarely or never using girl-preferred themes in play (Smith & Inder, 1993). Thus, more physical expression of conflict in mixed dyads than in boy dyads was expected, however, it did not support the previous finding. It is possible that mixed sex dyads had fewer chances for previous interaction as the same sex dyads due to the same sex preference emerging already in preschool years and due to dyadic composition was not voluntary but compulsory (i.e., children could have no experience of play with the given partner before). The history of play experience with a certain playmate might influence the interaction quality of dyads. Therefore, the history or previous play experience between members of a dyad should be considered in the investigation of interaction quality across different sex composition of dyads in future study.

Another issue for future research is how to control for the experience of children with a specific dyadic playmate. Non-friends would rarely interact with each other, since they have not ever chosen or been chosen as playmate before; thus, interaction in non-friend dyads would be too low to produce any kind of measurement of the qualities of their interaction. By extension, an assumption under teachers' ratings on paired dominance is that all individuals in a classroom interact with each other. However, it is questionable that children who were rated as 'equal-powered' truly have established dominance within a dyad. It is possible for those children to have no play experience with each other before thus teachers were uncertain which child is dominant to the other and rated them as 'not established dominance.' Hence it is required to accompany with other measurement of dominance (i.e., classroom ranking, direct observation in classroom). Further studies should develop a new way to assess the intensity scores managing unevenness in the frequency of interaction among different groups as suggested by Vaughn, Colvin, Azria, Caya, & Krzysik (2001) as well. Moreover, it is suggested that further studies inspect the typical patterns of conflict and harmony among friends and among non-friends and differentiate the patterns (e.g., shorter time between conflict and resolution for friends than non-friends; negotiation following conflict for friends versus giving up following conflict for non-friends). It might improve the level of prediction to extend the length of observation (e.g., longer than the 5-minute interval or multiple times of the 5-minute observation) getting a more reliable indicator of these interaction quality variables.

Conclusions. Relationship statuses seem to perform as a qualifier for dyadic interaction. This study controlled more outside the dyad parameters than any previous

studies investigating the influence of relationship status on interaction quality and demonstrated a robust, even if modest, effect relationship status on certain parameters of relationship quality. That individual level and demographic attributes also contribute (and perhaps contribute substantially more than relationship status) is interesting but does not diminish the effect of relationship status. Modest influences of relationship status variables were found for the intensity of conflict and frequency and intensity of harmony and not for frequency of conflict. Among the other predictive variables, behavioral disposition explained the majority of variance across interaction qualities, and socio-emotional characteristics followed as second significant qualifiers for interaction qualities. Affect expressiveness predicted the same emotional valence in interaction: positive affect expressiveness for harmony and negative affect expressiveness for conflict. Social competence was connected to frequency of harmony but also to intensity of conflict. In conclusion, relationship status, measured from teacher data, is meaningful qualifier at the dyadic interaction level and provided some insights into the nature of interactions in dyads of preschool children.

REFERENCES

Abecassis, M., Hartup, W., Haselager, G., Schole, R., & van Lieshout, C. (2002). Mutual antipathies and their significance in the middle childhood and adolescence. *Child Development, 73*, 1543-1556.

Abu-Lughod, L. (1993). *Writing women's worlds: Bedouin stories*. Berkeley, CA: University of California Press.

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 101, 213-232.

Agnor, C. J. (2009). A proposed model of friendship quality and attachment in preschool children. Unpublished manuscript. Seattle Pacific University, Seattle, WA.

Akers, C. V. (2006). *The expression of affect as correlate and predictor of social competence for preschool children*. Unpublished M. S. thesis, Department of Human Development and Family Studies, Auburn University.

Allison, P. D. (2001). *Missing Data.* Thousand Oaks, CA: Sage.

American Psychological Association (2010). *Publication Manuel of the American Psychological Association,* 6th ed. Washington, DC: American Psychological Assocaition.

Archer, J. (1988). *The behavioral biology of aggression*. Cambridge, UK: Cambridge University Press.

Asher, S. R. & Rose, A. J. (1997). Promoting children's social-emotional adjustment with peers. In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and*

emotional intelligence: Educational implications (pp. 196-230). New York: Basic Books.

Attili, G. (1990). Successful and disconfirmed children in the peer group: Indices of social competence within an evolutionary perspective. *Human Development, 33*, 238-249.

Azmitia, M., Lippman, D. N., & Ittel, A. (1999). On the relation of personal experience to early adolescents' reasoning about best friendship deterioration. *Social Development, 8,* 275-291.

Baumrind, D. (1967). Child care practices anteceding three patterns of preschool behavior. *Generic Psychology Monographs, 75*, 43-88.

Belle, D. (Ed.) (1989). *Children's social networks and social supports*. New York: Wiley.

Benenson, J. F. (1990), Gender differences in social networks. *The Journal of Early Adolescence,10*, 472-495.

Benenson, J. F. (1993). Greater preference among females than males for dyadic interaction in early childhood. *Child Development, 64*, 544-555.

Benenson, J., Apostoleris, N., & Parnass, J. (1998). The organization of children's same-sex peer relationships. In W. M. Bukowski, & A. H. Cillesen (Eds.), *Sociometry then and now: Building on six decades of measuring children's experiences with the peer group: No. 80. New directions for child development* (pp. 5-24). San Francisco: Jossey-Bass.

Berndt, T. J. (1981). Effects of friendship on prosocial intentions and behavior. *Child Development, 52*, 636-643.

Berndt, T. J. & Hoyle, S. G. (1985). Stability and change in childhood and adolescent friendships. *Developmental Psychology, 22*, 640-648.

Berndt, T. J. & Perry, T. B. (1986). Children's perceptions of friendships as supportive relationships. *Developmental Psychology, 22*, 640-648.

Bjorklund, D. F. & Pellegrini, A. D. (2000). Child development and evolutionary psychology. *Child Development, 71*, 1687-1708.

Birch, S. H., Ladd, G. W., & Blecher-Sass, H. (1997). The teacher-child relationship and children's early school adjustment: Good-byes can build trust. *Journal of School Psychology, 35*, 61-79.

Block, J. H. & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.) *Minnesota symposium on child psychology: Vol. 13. Development of cognition, affect, and social relations* (pp. 39-101). Hillsdale, NJ: Erlbaum.

Bost, K. K., Vaughn, B. E., Washington, W. N., Cielinski, K. L., & Bradbard, M. R. (1998). Social Competence, Social Support, and Attachment: Demarcation of Construct Domains, Measurement, and Paths of Influence for Preschool Children Attending Head Start. *Child Development, 69,* 192-218.

Boulton, M. J. & Smith, P. K. (1990). Affective bias in children's perceptions of dominance relationships. *Child Development, 61*, 221-229.

Boyatzis, C. J., Mallis, M. ,& Leon, I. (1999). Effects of game type on children's gender-based peer preferences: A naturalistic observational study. *Sex Roles, 40*, 93-105.

Buhrmester, D. & Furman, W. (1987). The development of companionship and intimacy. *Child Development, 58*, 1101-1113.

Cairns, R. B., Cairns, B. D., Neckerman, H. J., Gest, L. L., & Gariepy, J. L. (1988). Growth and aggression: I. Childhood to adolescence. *Developmental Psychology, 25*, 815-823.

Camras, L. A. (1984). Children' verbal and nonverbal communication in a conflict situation. *Ethology & Sociobiology, 5*, 257-268.

Charlesworth, W. R. & La Freniere, P. (1983). Dominance, friendship, and resource utilization in preschool children's groups. *Ethology and Sociobiology, 4,* 175-186.

Chen, D. W., Fein, G. G., & Tam, H-P. (2001). Peer conflicts of preschool children: Issues, resolution, incidence, and age-related patterns. *Early Education and Development, 12*, 523-544.

Coie, J. D., Dodge, K. A., & Kupersmidt, J. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood*, (pp. 178-201). New York, NY: Cambridge University Press.

Denham, S. A. (1986). Social cognition, social behavior, and emotion in preschoolers: Contextual validation, *Child Development, 57*, 194-201.

Denham, S. A. (1998). *Emotional development in young children*. New York: Guilford.

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development, 74,* 238-256.

Denham, S. A., Renwick, S., & Holt, R. (1991). Working and playing together: Prediction of preschool social-emotional competence from mother-child interaction. *Child Development, 62*, 242-249.

Doise, W. & Mugny, G. (1984). *The social development of the intellect.* Oxford:

Pergamon Press.

Doise, W., Mugny, G., & Perez, J-A. (1998). The social construction of knowledge:

Social marking and socio-cognitive conflict. In U. Flick (Ed.), *The psychology of the social* (pp. 77-90). New York: Cambridge University Press.

Dodge, K. A. (1986). A social information processing model of social competence in

children. In M. Perlmutter (Ed.), *Minnesota Symposia on Child Psychology (Vol. 18*, pp. 77-125). Hillsdale, NJ: Erlbaum.

Dovidio, J. F., & Ellyson, S. L. (1985). Patterns of visual dominance behavior in humans.

In S. L. Ellyson & J. F. Dovidio (Eds.), *Power, dominance, and nonverbal behavior* (pp. 129–149). New York: Springer-Verlag.

Doyle, A-B., Connolly, J., & Rivest, L-P. (1980). The effect of playmate familiarity on

the social interactions of young children. *Child Development, 51*, 217-223.

Eisenberg, A. R. & Garvey, C. (1981). Children's use of verbal strategies in resolving

conflicts. *Discourse Processes, 4*, 149-170.

Eisenberg, N. & Fabes, R. A. (1990). Empathy, conceptualization, measurement, and

relation to prosocial behavior. *Motivation and Emotion, 14*, 131-149.

Eisenberg, N., Fabes, R. A., Nyman, M., Berenzweig, J., & Pinuelas, A. (1994). The

relation of emotionality and regulation to preschoolers' anger-related reactions. *Child Development, 65*, 1352-1366.

Eisenberg, N., Fabes, R. A., Shepard, S. A., Murphy, B. C., Guthrie, J. K., & Jones, S.

(1997). Contemporaneous and longitudinal prediction of children's social functioning from regulation and emotionality, *Child Development, 68*, 642-664.

Fabes, R. & Eisenberg, N. (1992). Young children's coping with interpersonal anger. *Child Development, 64*, 116-128.

Fabes, R. A., Martin, C. L., and Hanish, L. D. (2004). The next 50 years: Considering gender as a context for understanding young children's peer relationships. *Merrill-Palmer Quarterly, 50*, 260-273.

Feiring, C. & Lewis, M. (1989). Sex and age differences in young children's reactions to frustration: A further look at the Goldberg and Lewis subjects. *Child Development, 50*, 848-853.

Foot, H. C., Chapman, A. J. & Smith, J. R. (1977). Friendship and social responsiveness in boys and girls. *Journal of Personality and Social Psychology, 35*, 401-411.

Frederickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218-226.

Furman, W. & Adler, T. (1982). *The Friendship Questionnaire*. Denver: University of Denver.

Furman, W. & Bierman, K. L. (1984). Children's conceptions of friendship: A multidimensional study of developmental changes. *Developmental Psychology, 20*, 925-931.

Furman, W. & Bierman, K. L. (1983). Developmental changes in young children's conceptions of friendship. *Child Development, 54,* 549-556.

Furman, W. & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology, 21*, 1016-1024.

Gershman, E. S. & Hayes, D. S. (1983). Differential stability of reciprocal friendships
and unilateral relationships among preschool children. *Merrill-Palmer Quarterly,
29*, 169-177.

Goncu, A. (1993) Development of intersubjectivity in the dyadic play of preschoolers.
Early Childhood Research Quarterly, 8, 99-116.

Goodwin, M. & Goodwin, C. (1987). Children's arguing. In S. Philips, S. Steele, & C.
Tanz (Eds.), *Language, gender, sex in comparative perspective*. Cambridge:
Cambridge University Press (pp. 200-248).

Graham, J. A., Cohen, R., Zbikowski, S. M., & Secrist, M. E. (1998). A longitudinal
investigation of race and sex as factors in children's classroom friendship choices.
Child Study Journal, 28, 245-266.

Green, E. H. (1933). Friendships and quarrels among preschool children. *Child
Development, 4*, 237-252.

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social
competence. *Social Development*, *10*, 79-119.

Hartup, W. W. (1989). Behavioral manifestations of children's friendships. In T. J.
Berndt & G. W. Ladd (Eds.), *Peer relationships in child development* (pp. 46-70).
New York: Wiley.

Hartup, W. W., French, D. C., Laursen, B., Johnston, M. K., & Ogawa, J. R. (1993).
Conflict and friendship relations in middle childhood: Behavior in a closed-field
situation. *Child Development, 64,* 445-454.

Hawley, P. H. (2006). Evolution and personality: A new look at Machiavellianism. In D. Mroczek & T. Little (Eds.), *Handbook of Personality Development* (pp. 147-162). NJ: Lawrence Erlbaum.

Hawley, P. H. (2003). Strategies of control, aggression, and morality in preschoolers: An evolutionary perspective. *Journal of Experimental Child Psychology*, 85, 213-235.

Hawley, P. H. (2002). Social dominance of prosocial and coercive strategies of resource control in preschoolers. *International Journal of Behavioral Development, 26*, 167-176.

Hawley, P. H. (1999a). The ontogenesis of social dominance: A strategy-based evolutionary perspective. *Developmental Review, 19*, 97-132.

Hawley, P. H. (1999b). Strategies of play and winning the game: A reply to Brian Vaughn, *Merrill-Palmer Quarterly, 45*, 363-369.

Hawley, P. H. & Little, T. D. (1999). On winning some and losing some: A social relations approach to social dominance in toddlers. *Merrill Palmer Quarterly, 43*, 185-214.

Hay, D. F., Castle, J., & Davies, L. (2000). Toddlers' use of force against familiar peers: A precursor of serious aggression? *Child Development, 71*, 457-467.

Hinde, R. R. & Stevenson-Hinde, J. (1976). Toward understanding relationships: Dynamic stability. In P. Bateson & R. Hinde (Eds.), *Growing points in ethology* (pp. 451-479). Cambridge: Cambridge University Press.

Hodges, E. V. E. & Card, N. A. (2003). *Enemies and the darker side of peer relations*. San Francisco: Jossey-Bass.

Hoffman, M. L. (1984). Interaction of affect and cognition on empathy. In C. E. Izard, J.

    Kagan, & R. B. Zajonc (Eds.), *Emotions cognition, and behavior* (pp. 101-131).

    New York: Cambridge University Press.

Hold-Cavall, B. C. L. & Borsutsky, D. (1986). Strategies to obtain high regard:

    Longitudinal study of a group of preschool children. *Ethology and Sociobiology,*

    7, 39-56.

Jacklin, C. N. & Maccoby, E. E. (1978). Social behavior at thirty-three months in same-

    sex and mixed-sex dyads. *Child Development, 49*, 557-569.

Keating, C. F. & Heltman, K. (1994). Dominance and deception in children and adults:

    Are leaders the best misleaders? *Personality and Social Psychology Bulletin, 20*,

    312-321.

Kerns, K. A. (2000). Types of preschool friendships. *Personal Relationships, 7,* 311-324.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in

    kindergarten: Related spheres of influence? *Child Development, 70*, 1373-1400.

Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a

    predictor of young children's early school adjustment. *Child Development, 67*,

    1103-1118.

La Freniere, P. J., Strayer, F. F., & Gauthier, R. (1984). The emergence of same-sex

    affiliative preferences among preschool peers: A developmental/ethological

    perspective. *Child Development, 55*, 1958-1965.

La Freniere, P. J. & Charlesworth, W. R. (1987). Effects of friendship and dominance

    status on preschooler's resource utilization in a cooperative/competitive

    paradigm. *International Journal of Behavioral Development, 10*, 345-358.

La Freniere, P. J. & Charlesworth, W. R. (1983). Dominance, attention, and affiliation in

a preschool group: A nine-month longitudinal study. *Ethology and Sociobiology, 4,* 55-67.

Lansford, J. E. & Parker, J. G. (1999). Children's interactions in triads: Behavioral

profiles and effects of gender and patterns of friendships among members. *Developmental Psychology, 35*, 80-93.

Laursen, B. (1993). Conflict management among close peers. In B. Laursen (Ed.), *Close

friendships in adolescence* (pp. 39-54). San Francisco: Jossey-Bass.

Laursen, B., Finkelstein, B. D., & Betts, N. T. (2001). A developmental meta-analysis of

peer conflict resolution. *Developmental Review, 21*, 423-449.

Laursen, B. & Hartup, W. W. (1989). The dynamics of preschool children's conflicts.

Merrill Palmer Quarterly, 35, 281-297.

Laursen, B., Hartup, W. W., & Koplas, A. L. (1996). Toward understanding peer

conflicts. *Merrill-Palmer Quarterly, 35*, 281-297.

Lever, J. (1976). *Sex differences in the games children play*. CA: University of California

Press.

Little, R. J. A. (1992). Regression with missing X's: a review. *Journal of the American

Statistical Association*, *87*, 1227-1238

Lockheed, M. H. (1986). Reshaping the social order: The case of gender segregation. *Sex

Roles, 14*, 617-628.

Lu, W-Y. (1998). Preschool conflict: Boys and girls in free play. *Dissertation Abstracts

International Section A: Humanities and Social Sciences, 59*, 414.

Maccoby, E. (1988). Gender as a social category. *Developmental Psychology, 24,* 755-765.

Maccoby, E. E. (1990). Gender and relationships: A developmental account. *American Psychologist, 45*, 513-520.

Miller, P. M., Denaher, D. L., & Forbes, D. (1986). Sex-related strategies for coping with interpersonal conflict in children aged five and seven. *Developmental Psychology, 22,* 543-548.

Newcomb, A. & Bagwell, C. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin, 117*, 306-347.

Newcomb, A. F., Brady, J. E., & Hartup, W. W. (1979). Friendship and incentive condition as determinants of children's task-oriented social behavior. *Child Development, 50*, 878-881.

National Institute of Child Health and Human Development Early Child Care Research Network (2005). Trajectories of physical aggression from toddlerhood to middle childhood. *Monographs of the Society for Research in Child Development, 69*, (4, 278).

National Institute of Child Health and Human Development Early Child Care Research Network (2001). Child care and children's peer interaction at 24 and 36 months: NICHD Early Child Care. *Child Development, 72*, 1478-1500.

Parker, J. G. & Gottman, J. M. (1989). Social and emotional development in a relation context: Friendship interaction from early childhood to adolescence. In T. J. Berndt & G. W. Ladd, *Peer relationships in child development* (pp. 95-131).

Park, K. A. & Waters, E. (1989). Security of attachment and preschool friendships. *Child Development, 60*, 1076-1081.

Pellegrini, A. D. (2008). The roles of aggressive and affiliative behaviors in resource control: A behavioral ecological perspective. Unpublished manuscript, University of Minnesota, Minneapolis, MN.

Petitt, G. S., Bakshi, A., Dodge, K. A., & Coie, J. D. (1990). The emergence of social dominance in young boys' play groups: Developmental differences and behavior correlates. *Developmental Psychology, 26*, 1017-1025.

Pellegrini, A. D., Roseth, C. J., Mliner, S., Bohn, C. M., Ryzin, M. V., Vance, N., Cheatham, C. L., & Tarullo, A. (2007). Social dominance in preschool classrooms. *Journal of Comparative Psychology, 121*, 54-64.

Peugh, J. L. & Enders, C. K. (2005). Using the SPSS mixed procedures to fit cross-sectional and longitudinal multilevel models. *Educational and Psychological Measurement, 65*, 717-741.

Piaget, J. (1985). *Equilibration of cognitive structures*. University of Chicago Press.

Pitcher, E. G. & Schultz, L. H. (1983). Review of boys and girls at play: The development of sex roles. *PsycCRITIQUES, 29*, 671.

Putallaz, M. & Wasserman, A. (1990). Children's entry behavior. In S. R. Asher & J. D. Coie, *Peer rejection in childhood* (pp. 60-89).

Rogoff, B. (1997). Evaluating development in the process of participation: Theory, methods and practice building on each other. In E. Amsel & K. A. Renninger (Eds.), *Change and development: Issues in change, method, and application* (pp. 265-285). Mahwah, NJ: Erlbaum.

Rose-Krasnor, L. (1997). The nature of social competence: A theoretical review. *Social Development, 6*, 111-135.

Roseth, C. J., Pellegrini, A. D., Bohn, C. M., Van Ryzin, M., & Vance, N. (2007). Preschoolers' aggression, affiliation, and social dominance relationships: An observational, longitudinal study. *Journal of School Psychology, 45*, 479-497.

Ross, H. S., Conant, C., Cheyne, J. A., & Alevisos, E. (1992). Relationships and alliances in the social interactions of kibbutz toddlers. *Social Development, 1*, 1-17.

Rubin, D. B. (1987). *Multiple Imputation for Nonresponse in Surveys*. New York: John Wiley and Sons.

Rubin, K.H. (1980). Fantasy play: Its role in the development of social skills and social cognition. In K.H. Rubin (Ed.), *Children's play.* San Francisco: Jossey-Bass.

Rubin, K. H. (1999). Contributions to knowledge about social-personality development: The Munich LOGIC Study. In F. Weinert & W. Schneider (Ed*.), Individual Development From Three to Twelve.* (pp. 243-252). New York: Cambridge University Press.

Rubin, K. H., Bukowski, W., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol1. Theoretical models of human development; Vol 3. Social-emotional and personality development (5th ed*., pp. 619-700). New York: Wiley.

Rubin, K. H., Hastings, P., Chen, X., Stewart, S., & McNichol, K. (1998). Intrapersonal and maternal correlates of aggression, conflict, and externalizing problems in toddlers. *Child Development, 69*, 1614-1629.

Rubin, K. H. & Rose-Krasnor, L. (1992). Interpersonal problem solving. In V. B. Van
Hasselt & M. Hersen (Eds.), *Handbook of social development* (pp. 283-323). New
York: Plenum Press.

Rydell, A. M., Berlin, L., & Bohlin, G. (2003). Emotionality, emotion regulation, and
adaptation among 5- to 8-year-old children. *Emotion, 3*, 30-47.

Saarni, C. (1999). *The development of emotional competence*. New York: Guilford Press.

Schafer, J.L. and Olsen, M.K. (1998) Multiple imputation for multivariate missing-data
problems: a data analyst's perspective. *Multivariate Behavioral Research*, 33,
545-571.

Schiffrin, D. (1984). Jewish argument as sociability. *Language in Society, 13*, 311-334.

Shantz, C. U. (1987). Conflicts between children. *Child Development, 58*, 283-305.

Shantz, D. W. & Schomer, J. (1977). *Interpersonal conflict in preschoolers: A
naturalistic study*. Paper presented at the fifth biennial meeting of the Southeast
Regional meeting of the Society for Research in Child Development, Atlanta.

Shin, N., Vaughn, B. E., Kim, M., Kryzsik, L., Bost, K. K., McBride, B.,Santos, A.
J.,Peceguia I., and Coppola, G. (in press). *Longitudinal analyses of a hierarchical
model of peer social competence for preschool children: Structural fidelity and
external correlates*.

Shulman, S. & Laursen, B. (2002). Adolescent perceptions of conflict in interdependent
and disengaged friendships. *Journal of Research on Adolescence, 12*, 353-372.

Sluckin, A. M. (1980). Dominance relationships in preschool children. In D. R. Omark,
F.F., Strayer, & D. G. Freedman (Eds.), *Dominance relations: An ethological*

view of human conflict and social interaction (pp. 159-174). New York: Guilford.

Sluckin, A. M. & Smith, P. K. (1977). Two approaches to the concept of dominance in preschool children. *Child Development, 48*, 917-923.

Smith, A. B., Inder, P. M. (1993). Social interaction in same and cross gender preschool peer groups: A participant observation study. *Educational Psychology, 13*, 29-42.

Sroufe, L. A., Schork, F., Motti, F., Lawroski, N., & LaFreniere, P. (1984). The role of affect in social competence. In C. E. Izard, J. Kagan, & R. B., Zajone (Eds.), *Emotions, cognition, and behavior* (pp. 289-319). Cambridge, UK: Cambridge University Press.

Strayer, J. (1993). Children's concordant emotions and cognitions in response to observed emotions. *Child Development, 64*, 188-201.

Strayer, F. F. (1989). Co-adaptation within the peer group: A psychological study of early competence. In B. Schneider, G. Attili, J. Nadel, & R. Weisman (Eds.), *Social competence in developmental perspective* (pp. 145-174). Dordrecht, Netherlands: Kluwer.

Strayer, F. F. (1980). A naturalistic study of empathic behaviors and their relation to affective states and perspective-taking skills in preschool children. *Child Development, 51*, 815-822.

Strayer, F. F., & Strayer, J. (1976). An ethological analysis of social agonism and dominance relations among preschool children. *Child Development*, 47, 980-989.

Strayer, F. F. & Trudel, M. (1984). Developmental changes in the nature and function of social dominance among young children. *Ethology and Sociobiology, 5*, 279-295.

Swierczek, W. F. & Onishi, J. (2003). Culture and conflict: Japanese managers and Thai
subordinates. *Personnel Review, 32*, 187-210.

Turiel, E. (2004). Historical lessons: The value of pluralism in psychological research.
Merrill-Palmer Quarterly, 50, 535-545.

Turiel, E. & Wainryb, C. (2000). Social life in cultures: Judgments, conflict, and
subversion. *Child Development, 71*, 250-256.

Vaughn, B.E. (2001). A Hierarchical Model of Social Competence for Preschool-Age
Children: Cross-Sectional and Longitudinal Analyses. *Revue Internationale de
Psychologie Sociale, 14*, 13-40.

Vaughn, B. E., Akers, C. V., Kim, M., Stevens, S., Krzysik, L., Coppola, G., Bost, K.,
McBride, B., & Korth, B. (under review). *Affect expressiveness in preschool
children: Age-related changes and relations with indicators of social competence.*

Vaughn, B. E., Colvin, T. N., Azria, M. R., Caya, L., & Krzysik, L. (2001). Dyadic
Analyses of Friendship in a Sample of Preschool Age Children Attending Head
Start: Correspondence Between Measures and Implications for Social
Competence. *Child Development, 72,* 862-878.

Vaughn, B. E., Shin, N., Kim, M., Coppola, G., Krzysik, L., Santos, A. J., Pecequina, I.,
Daniel, J. R., Verissimo, M., DeVries, A., Elphick, E., Ballentina, X., Bost, K. K.,
Newell, W. Y., Miller, E. B., Snider, J. B., & Korth, B. (2009). Hierarchical
models of social competence in preschool children: A multi-site, multi-national
study. *Child Development, 80*, 1775-1796.

Vaughn, B. E. & Santos, A. J. (2007). Why they don't all get along: An evolutionary/ecological account of aggressive behavior and trait. In P. Hawley (Ed.), *Aggression and adaptation: The bright side to bad behavior* (pp. 31-63). Mahwah, NJ: Erlbaum.

Vaughn, B. E., Vollenweider, M., Bost, K. K., Azria-Evans, M. R., & Snider, J. B. (2003). Negative interactions and social competence for preschool children in two samples: Reconsidering the interpretation of aggressive behavior for young children. *Merrill-Palmer Quarterly, 49*, 245-278.

Vaughn, B. E. & Waters, E. (1981). Attention structure, sociometric status, and dominance: Interrelations, behavioral correlates, and relationships to social competence. *Developmental Psychology, 17*, 275-288.

Verbeek, P. & de Waal, F. B. M. (2001). Peacemaking among preschool children: Peace and conflict. *Journal of Peace Psychology, 7*, 5-28.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Waldrop, M. F. & Halverson, C. F. Jr. (1975). Intensive and extensive peer behavior: Longitudinal and cross-sectional analyses. *Child Development, 46*, 19-26.

Waters, E., Noyes, D., Vaughn, B. E., & Ricks, M. (1985). Q-sort definitions of social competence and self-esteem: Discriminant validity of related construction theory and data. *Developmental Psychology, 17*, 275-288.

Waters, E. & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental Review, 3*, 79-97.

Waters, E., Wippman, J., & Sroufe, I. A. (1979). Attachment, positive affect, and competence in the peer group: Two studies in construct validation. *Child Development, 50*, 821-829.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297-333.

Williams, D. E. & Schaller, K. (1993). Peer persuasion: A study of children's dominance strategies. *Early Child Development and Care, 88*, 31-41.

Youniss, J. (1980). P*arents and peers in social development: A Piaget-Sullivan perspective*. Chicago: University of Chicago Press.

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology, 28*, 126-136.