Students' Perceptions of Recess: An Examination of Predictors of Peer Conflict

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STUDENTS' PERCEPTIONS OF RECESS: AN EXAMINATION OF PREDICTORS OF PEER CONFLICT

by

Kadie Dooley

A DISSERTATION

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Recess plays an important role in students’ school days because it provides opportunities to interact with their peers in unstructured settings. Some research has explored the relation between peer conflict within school contexts and how it is related to locations of positive play and the presence of adult supervisors. Further, researchers have conducted studies to examine within group differences for gender and grade, as well as between school differences. However, results have been mixed.

This dissertation examined the degree to which the following variables were related to where peer conflict occurs during recess: location of adult supervisors, location of positive play, students’ gender, students’ grade, and students’ school. Participants included 1043 second through fifth grade students in three schools from a Midwestern state. Data collected included student marked playground maps showing where students engage in peer conflict and positive play, where adult supervisors are located, and where students spend most of their time at recess: in addition to students’ self-reported grade, gender, and school. Logistic regressions were used to examine relations between location of peer conflict and location of positive play, location of adult supervisors, students’ gender, students’ grade, and students’ school. Results indicated that there was at least one location that demonstrated a significant relation with peer conflict across the variables studied. There were significant odds that peer conflict would occur in one of the common
playground locations when adult supervisors were located there. Four locations
demonstrated a significant relation among the occurrence of peer conflict and the absence
of positive play. Results also showed a significant relation among peer conflict and
students’ gender, though results were mixed as to the odds of peer conflict occurring for
males as compared to females. There were significant relations across grades with lower
grades indicating that conflict was more likely to occur in certain playground locations as
compared to higher grades. Results also showed significance of peer conflict occurring
between schools. Future research and implications for practice are discussed.
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CHAPTER 1: IMPORTANCE

Almost 97% of public elementary schools in the United States have recess for at least one grade within their building (Barros, Silver, & Stein, 2009; Lee, Burgeson, Fulton, & Spain, 2007). Recess is a time for students to rest, play, use their imaginations, and socialize with their peers (Pellegrini, 2005). During recess, children engage in active unstructured, undirected free play (Barros et al., 2009; Waite-Stupiansky & Findlay, 2001). The National Association of Early Childhood Specialists in State Departments of Education (2002) state that recess is an essential component of education. This may be because learning at recess occurs in ways that are not always possible inside the classroom. During recess, students are able to construct the learning environment for themselves without adults telling them how to play (Santa, 2007). Students can make their own choices, implement plans they have designed, and expand their creativity by playing with peers and interacting with the natural environment (National Association, 2002). While playing at recess, students are able to practice essential life skills such as conflict resolution, respecting rules, taking turns, sharing, using language to communicate, and problem solving in real situations. The opportunities that occur during recess assist students in developing perspective-taking skills so that they are better able to cooperate, help, share, and solve problems with peers.

The origins of recess can be traced back to the beginning of the nineteenth century when educators began advocating for an outdoor space that would allow children to engage in activities outside of the classroom while their behavior was still monitored by adults (Thomson, 2005). Since this time, the role and expectations of recess have evolved from simply taking a break from academics to using recess to further develop necessary
life skills such as social awareness, conflict resolution, self-efficacy, and problem-solving.

The Council on Physical Education for Children (2001) suggests that schools should provide a daily recess for all students in elementary school (i.e., pre-kindergarten through sixth grade) and the National Association for Sport and Physical Education (NASPE) recommends that all elementary students should receive at least one daily recess period that lasts at least 20 minutes (NASPE, 2008). However, only 74% of elementary schools in the United States provide recess for students in all grades (Lee et al., 2007). In recent years, the amount of time allocated for recess has been reduced (Barros et al., 2009), especially for older elementary students (Ramstetter, Murray, & Garner, 2010). In fact, forty percent of schools have reduced or eliminated recess since 1998 in order to make more time available for academic instruction (Clements, 2000). Between fourteen and eighteen percent of elementary students only receive 15 minutes or less of recess each day (National Center for Education Statistics, 2007). This may be due to the recent trend towards dedicating more of students’ classroom time to academic learning in order to prepare them for benchmark tests under the No Child Left Behind Act (Santa, 2007).

**The Role of Recess**

Recess fosters peer interactions that allow students to learn necessary social skills (Pellegrini, 2005; Pellegrini, Blatchford, Kato & Baines, 2004). More specifically, recess is the main avenue for students to develop social skills that allow them to interact with and make friends with their peers (Blatchford, 1996; Blatchford 1998; Perry, 2003; Wilson, 2008). This is because recess is one of the few times during the school day when
students’ bodies and voices are not under strict control and students are able to interact with their peers without adult mediation (Blatchford, 1998; Lewis & Phillipsen, 1998; Pellegrini, 1995). Not surprisingly, restricting social experiences at recess has a negative effect on social adjustment (Suomi & Harlow, 1972).

In many schools within the United States, recess is the only time during the school day when students direct their own play, allowing them to communicate more effectively with their peers through negotiation, cooperation, sharing, and problem solving (Pellegrini, Huberty, & Jones, 1995; Wilson, 2008). According to the American Academy of Pediatrics, unstructured play is essential for helping students manage stress, become resilient, reach important social, emotional, and cognitive developmental milestones, and stay physically healthy (Barros et al., 2009).

**Peer Conflict and Positive Play at Recess**

School’s recess procedures are often designed to prohibit peer conflict. This reactive approach is often punitive in that recess supervisors may take away a game that often leads to peer conflict while failing to replace the game with another activity that promotes positive play. For example, soccer often causes peer conflict among students playing the game because it is a competitive game that requires players to possess athletic skills (Doll & Brehm, 2010). When students who are not skilled in soccer join the game, it can become irritating to the more skilled players and cause peer conflict. Other playground games are often prohibited due to safety and peer conflict concerns (e.g., dodge ball and tag).

It is equally important that recess procedures maximize students’ opportunities to engage in positive play with classmates. Specific routines and procedures that promote
positive play include praising or rewarding students for engaging in positive play (Schoen & Bullard, 2002). Additionally, when teachers specifically engage students in cooperative games, students are more likely to play positively with peers and so opportunities for peer conflict decrease (Bay-Hinitz, Peterson, & Quilitch, 1994; Butcher, 1999).

Some early research suggests that location may contribute to the occurrence of peer conflict and positive peer experiences. In one study, when prompted to indicate where peer conflict occurs at school, locations that lacked specific ownership and adult supervision (e.g., hallways, playgrounds, lunchrooms) were the top locations identified by students (Astor, Meyer, & Behre, 1999). In a similar study, students selected the playground as the most common location for both peer conflict and positive play (Zumbrunn, Doll, Dooley, LeClair, & Wimmer, 2013). Dooley, Doll, Jones, and Wimmer (2011) conducted a similar study that specifically asked students to report where peer conflict and positive play occurred at recess. These results suggested that peer conflict and positive play occurred in the same locations on the playground.

**Purpose of the Study**

The purpose of this study was to examine factors hypothesized to be related to where peer conflict occurs during recess. This dissertation will examine the following research questions:

1. Is the location of playground peer conflict related to the location where adult supervisors stand?

2. Is the location of playground peer conflict related to the location where positive play occurs?
3. Do male and female students identify different locations where peer conflict occurs?

4. Is the location of playground peer conflict related to students’ grade level?

5. Are there differences between schools that affect where peer conflict occurs?
CHAPTER 2: LITERATURE REVIEW

The purpose of this study was to examine variables that are related to where peer conflict occurs during recess. The previous chapter briefly described the importance of recess as it relates to student outcomes. This chapter will review research related to peer conflict, positive play, and supervision practices. Additionally, the relation between these variables will be discussed. Finally, the chapter will review the playground mapping procedure that has been used in prior research to describe where peer conflict and positive play occur at recess.

Peer Conflict

Peer conflict can present itself in many ways. Peer conflict that manifests as aggressive behavior is intended to hurt, harm, or injure another person through physical and/or verbal acts (Coie & Dodge, 1998; Ostrov & Crick, 2007). Peer aggression occurs frequently in elementary school: between 20 and 30 percent of elementary school students identify as a bully, victim, or bully-victim (Leff, Kupersmidt, Patterson, & Power, 1999; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). Acts of aggression happen most often at school in unstructured settings such as recess (Colvin & Lowe, 1986; Craig & Pepler, 1997; Craig, Pepler, & Atlas, 2000).

Research has shown many negative outcomes for students who are aggressive with their peers. Developing aggressive behaviors early in elementary school has been linked to academic problems (Kazdin, 1994), difficulty with emotion regulation (Cumming, Iannotti, & Zahn-Waxler, 1985), difficulty with social problem-solving (Lochman & Dodge, 1994), peer rejection (Kupersmidt, Coie, & Dodge, 1990), and serious aggression and violence as the student gets older (Loeber et al., 1993). Similarly,
the students who are the victims of aggression also are likely to experience negative outcomes, such as depression and anxiety (Olweus, 1978), loneliness (Kochenderfer & Ladd, 1996), poor self-esteem (Olweus, 1978), and school avoidance (Kochenderfer & Ladd, 1996). The students who are observers of aggression at recess may also be impacted.

Social learning theory suggests that students learn to behave in an aggressive manner by observing others engaging in aggressive behaviors and then receiving positive reinforcement for exhibiting these negative behaviors (Bandura, 1973; Dishion, Capaldi & Spracklen, & Li, 1995). Some students may see a benefit to engaging in aggression (Leff, Costigan, & Power, 2004) because other students who are involved in conflict or aggression with their peers are viewed as popular and central to the social network within the class (Farmer, Estell, Bishop, O’Neal, & Cairns, 2003; Rodkin, Farmer, Pearl, & Van Acker, 2006; Woods, 2009).

Relational aggression is a form of peer conflict that is used to damage a relationship with another person through gossip, lies, spreading secrets, and intentionally ignoring or leaving someone out (Crick & Grottpeter, 1995). Blatchford and colleagues (2003) found that peer aggression often occurred when students were involved in conversations. Ostrov and Crick (2007) found that relational aggression predicted future problems such as peer rejection and student-teacher conflict. These results show that relational aggression is a serious source of peer conflict during recess.

While peer conflict most often occurs between students and their friends, bullying frequently occurs between students and non-friends (Doll, Spies, LeClair, Kurien, & Foley, 2010) Bullying occurs when aggressive behavior is intended to harm, occurs
repeatedly over time, and when a difference in power exists between students (Nansel et al., 2001). In the current study, no attempt will be made to distinguish between bullying and other forms of peer aggression.

**Defining peer conflict.** Conflict has been defined as a state of disagreement that involves incompatible or opposing behaviors and views (Laursen & Pursell, 2009). Shantz (1987) stated that conflict contains several distinct features such as behaviors that start, perpetuate, and conclude the conflict. Conflict must include overt behavioral opposition, meaning that the behaviors showing disagreement or opposition must be directed toward another person, the conflict must be observable, and the behavior must take a contrary position or action (Laursen & Pursell, 2009). Peer conflict encompasses physical, verbal, and relational aggression, as well as bullying behaviors.

**Predicting peer conflict.** The likely predictors of peer conflict evolve as a child develops. Peer conflict among younger students is likely to involve disagreement over objects (Hay & Ross, 1982). As students develop socially, their disputes are less likely to involve objects and more likely to revolve around the desire to control social behavior (Hartup & Laursen, 1993). During adolescence, students’ conflicts with peers are likely to involve interpersonal concerns. Further, there are several factors that make it more or less likely that conflict will occur on the playground: (a) the activities that are available for students to play (Bay-Hinitz et al., 1994; Murphy, Hutchison, & Bailey, 1983; Nabors, Willoughby, Leff, & McMenamin, 2001; Pellegrini et al., 2004); (b) the number of adult supervisors (Ladd & Price, 1993; Leff et al., 2004); and (c) playground rules (Leff et al., 2004).
**Playground activities.** The number of diverse playground activities for students to engage in during recess has been linked to peer conflict (Boulton & Smith, 1993; Leff et al., 2004). When schools provide an adequate number of activities that promote cooperation rather than competition, they tend to have lower levels of peer conflict (Bay-Hinitz et al., 1994; Leff et al., 2004).

**Adult supervisors.** Ladd and Price (1993) linked children’s playground behavior to the number of adult supervisors. Specifically, they found that when fewer supervisors are found on a playground, there are more opportunities for students to engage in conflict with their peers. The type of supervision is also a likely factor (Leff, Power, Costigan, & Manz, 2003). Less peer conflict is noted when supervisors engage in frequent and active playground supervision by being alert to what is happening on the playground, talking with students, praising positive behaviors, and using effective discipline techniques to reduce peer conflict.

**Playground rules.** Effective adult supervisors provide, describe, and periodically review the playground rules with students (Leff et al., 2004, Nabors, Leff, & Power, 2004). Nabors and colleagues (2004) administered a questionnaire to recess supervisors that assessed their communication of playground rules to students. The questionnaire was re-administered after implementing an intervention that consisted of bi-weekly supervisor meetings in which supervisors reviewed playground rules and discussed behavior management techniques. Results demonstrated that peer conflict decreased after playground supervisors were trained to actively promote playground rules.

**Assessing peer conflict.** Several different methods have been used by schools to evaluate peer conflict on the school playground, including nursing logs, discipline
referrals, playground observations, teacher reports, playground supervisor reports, sociometric surveys, and student self-reports (Leff, Power, & Goldstein, 2004). Of these methods, schools have typically relied on reports from adults (e.g., teachers and school personnel), third party objective observers, and reports from students to assess the prevalence and effects of peer conflict (Canary, Cupach, & Messman, 1995; Espelage & Swearer, 2003).

Teacher reports of peer conflict on the playground are problematic because teachers are often not the adults who are supervising the playground (Leff, Power, Manz, Costigan, & Nabors, 2001) and, thus, their reports of incidents are second-hand. Still, even school personnel or third party observers who directly observe the playground are likely to under report peer conflict because much of it occurs outside of the watchful eyes of adult supervisors (Cunningham et al., 1998; Doll, Murphy, & Song, 2003). Even when adults recognize peer conflict, they are likely to only notice physical peer conflict while much of the verbal peer conflict goes unnoticed by adults (Craig & Pepler, 1997). Overall, supervisors are aware of only a small portion of the peer conflict that occurs at recess (Cunningham et al., 1998). This is perpetuated when nursing logs and discipline referrals generally document physical conflict only and are insensitive to the verbal and relational conflict that occurs on playgrounds. Another reason that adults’ reports of peer conflict are problematic is that adults are often unable to distinguish between actual physical conflict and rough-and-tumble-play that occurs between friends (Cairns & Cairns, 2000; Craig & Pepler, 1997).

Student reports of peer interactions at recess are more sensitive to verbal and relational aspects of peer conflict (Craig & Pepler, 1997; Leff et al., 2004; Slee, 1995;
Tapper & Boulton, 2004). Aggregated self-report measures have been administered to students in past studies in order to understand their perceptions of peer conflict (Burk, Denissen, Van Doorn, Branje, & Laursen, 2009; Crick & Ladd, 1989; Doll et al., 2003; Laursen & Koplas, 1995; Noll, Zeller, Vannatta, Bukowski, & Davies, 1997). For example, when elementary students in one school were asked about their perceptions of recess, 22% reported that kids in their class almost always or often argued with each other and 25% reported worrying about other students teasing or being mean to them (Doll, Kurien, LeClair, Spies, Champion, & Osborn, 2009). Overall, aggregated self-report measures are good tools to assess students’ perceptions of interactions within their environment, including occurrences of peer conflict (Howes, 2000; Lehr & Christenson, 2002).

**Student characteristics that affect peer conflict.** Research suggests that perceptions of peer conflict may differ between groups of students. Numerous studies have been conducted in order to examine the relation among males and females and students across grade levels.

**Gender.** Research findings have been mixed when examining gender differences in peer conflict. Specifically, some research suggests that male students are more likely to be involved in peer conflict that is physical in nature, while female students are more likely to be involved in peer conflict that hurts or damages friendships (Crick, Bigbee, & Howes, 1996; Salmivalli, Lappalainen, & Lagerspetz, 1998; Skues, Cunningham, & Pokharel, 2005). When mixed gender groups are formed, they are more similar to all male groups rather than female exclusive groups (Smith & Inder, 1993). This suggests that male and mixed-gender groups are more likely than exclusively female groups to
involve peer conflict that is physical. However, other studies have found that there are no differences in how peer conflict manifests among genders (Hanish, Kochenderfer-Ladd, Fabes, Martin, & Denning, 2004). When examining student reports of peer conflict, Dooley, Doll, Chadwell, and Turner (2011) found no gender differences, suggesting that gender did not play a significant role in how the students perceived peer conflict.

Similarly mixed results have been found when examining gender differences in student reports of where peer conflict is likely to occur. Astor (1998) gave school maps to students and asked them to identify unsafe areas of the school. Results showed that 25% to 30% of the schools’ physical space was considered unsafe by female students, as compared to male reports that 10% to 20% of the school space was unsafe. Based on this data, Astor suggests that male and female students perceived peer conflict differently in various school locations. On the other hand, Zumbrunn and colleagues (2013) and Astor and colleagues (2001) reported no gender differences in student reports of the locations peer conflict is likely to occur in schools.

**Grade.** Prior studies (Astor et al., 1999; Astor et al., 2001; Zumbrunn et al., 2013) have suggested that it is likely that students perceive locations of peer conflict differently as they get older. Students’ play and the behavioral expectations for specific locations may be unique for students in particular grade levels (Darling, Caldwell, & Smith, 2005; Garton, 1991). For example, Dooley and colleagues (2011) analyzed peer conflict profiles of elementary school students and found evidence that students develop skills and competencies to manage peer conflict as they age and move into older grades. Other studies suggest that older students perceived peer conflict within their environment differently than younger students. In the Zumbrunn et al. (2013) study, older students
perceived less peer conflict in stairwells than younger students. Additionally, older students reported the playground to be a less cooperative setting than younger students.

**Positive Play**

**Defining positive play.** The characteristics of “play” include being intrinsically motivating, free from externally imposed rules, actively engaging, and involving self-imposed goals (Rubin, Fein, & Vanderberg, 1983). More recently, children’s play has been described as including games with rules, activity just for the sake of activity (instead of for a common purpose), and solitary or cooperative play (Pellegrini & Smith, 1998). The level of interaction between children is important to the developmental progression of play. Specifically, “parallel” play has been defined as a child playing beside but not with other children and “solitary” play has been defined as children engaging in play by themselves (Coplan & Arbeau, 2009). These are the earliest forms of play to emerge in children. “Associative” play occurs when social interaction and the sharing of materials occur, but no real cooperation is displayed. The highest level of play, “cooperative” play, is demonstrated when the children participate together in an activity with a common goal. In all four types of play, children are engaging in positive play behaviors rather than experiencing peer conflict. Therefore, in its simplest form, positive play involves students getting along. Further, positive play often includes students engaging in harmonious and friendly play, which is often demonstrated through students use of kind or encouraging words, sharing resources with peers, helping peers, and including others in their play groups (Ladd & Price, 1993).

School personnel often focus on only negative playground behaviors without recognizing the positive role that recess plays for students (Pellegrini et al., 2004). The
enculturation hypothesis states that through games, role enactment, and role reversal with peers, students acquire skills that allow them to grow in social competence (Sutton-Smith, 1975). This hypothesis has been supported through studies showing that when students engage in positive play by playing games with peers they learn lessons and rules that strengthen their adjustment to school and general social interactions (see Sluckin, 1981).

Predicting positive play. Several factors are likely to predict the occurrence of positive play. Positive play is more likely to occur when playgrounds have adequate resources so that children are not fighting over materials (Doll, Jones, Osborn, Turner, & Dooley, 2010). Some playgrounds are also too small for the number of students that have recess at the same time. Alternatively, schools with expansive playgrounds may have difficulty containing and adequately supervising students. Positive play is most likely to occur on playgrounds that are neither too small nor too large and have an appropriate number of resources (e.g., balls, jump ropes) per student.

Adult supervisors play a role in encouraging students to engage in positive play (Leff et al., 2003). When supervisors actively enforce rules and cooperative play among peers then they are encouraging positive play. Adults can also enhance the type, number, and diversity of the games that are played at recess, which is likely to play a role in the type of student interactions.

Student perceptions of recess are also likely to affect the occurrence of positive play. Some locations are viewed as peaceful or calm and so students are more likely to report that peers cooperatively play with each other in these places (Zumbrunn et al., 2013). Similarly, the locations that students deem as “fun” and where they enjoy being
around their friends are likely places where they will engage in positive play. In summary, locations where students experience positive play evolve from student perceptions of the playground, as well as the playground’s physical features.

**Assessing positive play.** Positive play has typically been assessed by collecting student perspectives using surveys and questionnaires and through adult observations (Doll, Jones, et al., 2010; Miller, Cooke, Test, & White, 2003). Miller and colleagues (2003) observed target students during recess and categorized their overall play as friendly, unfriendly, or isolated. Friendly play was used to describe when students engaged with their peers in a neutral or positive manner. Similarly, Doll, Jones, Osborn, Turner, and Dooley (2010) observed groups of students on different areas of the playground for two one-minute intervals. If any students were observed to be playing together or having fun in that location during that interval then positive play was marked as having occurred. Overall, students were observed to be playing together in different locations in more than 75% of the intervals and having fun in over 62% of the intervals.

Student perceptions of social interactions that occur in specific school contexts shape student behaviors within those locations (Hernandez & Seem, 2004). How students perceive their school environment is likely to significantly impact their behavior and shape how they think and feel about themselves and their surroundings, making the task of gathering student perceptions an important one (Koth, Bradshaw, & Leaf, 2008; Loukas & Robinson, 2004; Welsh, 2000). Also, student reports of their interactions with peers are more sensitive to the intricate aspects of social relationships than adult observations (Craig & Pepler, 1997; Leff et al., 2004; Slee, 1995; Tapper & Boulton, 2004). Researchers have collected students’ perspectives using surveys asking about
student’s positive experiences with their classmates (Doll, Spies, et al., 2010; Haynes, Emmons, & Comer, 1993; Zumbrunn et al., 2013). For example, Doll, Jones, Osborn, Turner, and Dooley (2010) administered the ClassMaps Survey to students in third through fifth grade at an elementary school. Students’ results from one of the third grade classrooms showed that 72% of students in the class indicated that they ‘almost always’ have fun with their classmates and 76% reported that they ‘almost always’ have at least one classmate to eat lunch and play with at school. Self-report measures are especially useful when assessing more than one behavioral characteristic, students’ knowledge of interactions over time, and when using a large sample size (Asher & McDonald, 2009).

**Student characteristics that affect positive play.** Perceptions of positive play may differ between groups of students. Specifically, differences in positive play have been examined across genders and grade levels.

**Gender.** Males have been observed to be involved in more social and rough-and-tumble play, while girls were engaged in more parallel, solitary, positive play (Blatchford et al., 2003; Lewis & Phillipsen, 1998; Pellegrini & Smith, 1998). Male groups tend to be engaged in physically demanding games and control large, specific places where sports are played, such as soccer fields and basketball courts. In comparison, female groups play more verbally demanding games and often occupy equipment areas and concrete pads (Lewis & Phillipsen, 1998; Pellegrini et al., 2004). These findings suggest that there are differences among genders in the locations where students are likely to experience positive play at recess.

Interestingly, male playgroups have been found to be more inclusive and larger than female groups (Benenson, 1994; Pellegrini & Smith, 1998). However, when mixed
gender groups are formed, they are more similar to all male groups rather than female
exclusive groups (Smith & Inder, 1993). Specifically, male and mixed-gender groups are
more likely than exclusively female groups to involve rough-and-tumble play. In light of
these findings, it is interesting to note that Zumbrunn and colleagues (2013) and Astor
and colleagues (2001) reported no gender differences in student reports of the locations
where positive play is likely to occur in different schools.

**Grade.** Students’ behaviors and interactions with peers change as they get older
and are promoted to the next grade. As students get older, their physical, cognitive, and
social skills develop so that their abilities to interpret and respond to social interactions
also mature (Fabes, Martin, & Hanish, 2009). Despite this, researchers have only found
small grade effects for the differences in positive play at school (Astor et al., 2001;
Zumbrunn et al., 2013).

**Recess Games**

Recess games support students’ interactions with less familiar peers and enhance
the social competence of students who are not socially sophisticated (Pellegrini &
Blatchford, 2002). Pellegrini and colleagues (2004) conducted a study of 204 first year
students in both the United States and England in order to assess how playground games
developed throughout the school year. Behavioral observations during recess were
conducted for students in four classrooms within four different schools in London and six
classrooms in two schools in the United States. During recess, observers coded the games
that students played (e.g., chase, ball, jumping/verbal). Data was analyzed using a 2
(time: fall, spring) x 2 (gender) x 2 (country: USA/UK) analysis of variance (ANOVA)
where the first factor was a within-subjects variable and the last two factors were
between-subjects variables. Results showed that American students engaged in games more frequently than British students, boys played more games than girls, and boys increased the number of games they played from Time 1 to Time 2 while girls significantly decreased the number of games they played at recess. Boys played more ball and chase games than girls, while girls played more games that had verbal components. The games increased in complexity across the year (e.g., requiring social, cognitive, and physical coordination), suggesting that the simpler games acted as scaffolds for the subsequent more complex peer interactions (Blatchford, 1998). Overall, the activities that students engaged in during recess played a critical role in facilitating peer interactions and developing friendships.

Students’ conflict or positive play at recess may be related to how games are organized. Siemers (2006) asked fifty-seven recess supervisors, representing 22 recess groups at 10 schools, to identify the most common playground activities that students engage in during recess at their school. The most common competitive playground games across the schools were found to be soccer, basketball, and football (98%, 93% and 83% respectively). The least common competitive games across the schools were baseball and dodgeball (18% and 25% respectively). The most common non-competitive/cooperative games across the schools were monkey bars, slide, and jump ropes (98%, 92%, and 90%). The least common non-competitive games across the schools were swings and funnel ball (5% and 9%). The games that students play with each other are likely to be significant sources of peer interactions on the playground. The types of games that are played are likely to effect whether these interactions are positive or negative. Also, the
games that are played at recess may vary between schools and, therefore, may affect where conflict and positive play occur on each playground.

**Recess Supervision**

**Defining supervision.** According to Merriam-Webster dictionary, the word supervisor means “one that oversees.” More specifically, recess supervisors are the adults who are charged with the task of observing students’ play so that they can prevent behaviors from escalating, thwart students from breaking the rules, and stop students from injuring themselves and others (Schwebel, 2006). Additionally, when the number of supervisors per child is small, the instances of peer conflict are likely to increase and the opportunities for adults to positively interact with and provide consequences for inappropriate behavior diminishes (Ladd & Price, 1993; Siemers, 2006).

Research has shown that it is not uncommon for students to behave differently depending on whether adults are present. For example, Schwebel and Bounds (2003) used a laboratory setting to assess for differences in children’s behavior when their parents were close in proximity to the child versus when the parents were not available. Children whose parents were close by, either in the room with the child or behind a one-way mirror, were less likely to take risks in their behavior than the children whose parents were not close by or available to the child. The authors hypothesized that students may be more cautious in their behavior at recess when they know that a supervisor is close by.

Additionally, by setting up a video camera and microphone on the playground and recording approximately 48 hours of recess behaviors, Craig and Pepler (1997) found that supervisors intervened in a mere 4% of the documented episodes of peer conflict.
Supervisors were seen in the view of the camera in 25% of the peer conflict episodes. Instead, in this study, peers intervened in acts of peer conflict more frequently (13%) than adult supervisors did ($z = 3.96, p < .01$). Interestingly, when adults were present they were almost twice as likely to intervene than peers (23% versus 13%). Outside observers documented that supervisors were unaware of 80% of the episodes of peer conflict. This may be due to the fact that students often engage in peer conflict in locations that are outside of the watchful eyes of adult supervisors.

**What occurs during recess supervision.** Recess gives students many opportunities to interact with peers without constant adult oversight (Doll et al., 2003). Recess is characterized by large groups of students with minimal structure and adult supervision (Hendricks, 1993). In fact, little attention has been given to the role and effect of the recess supervisor (Evans, 1989) and so it is often the case that recess supervisors intervene with students only when it is absolutely necessary or when they are directly asked to do so (Lewis, Colvin, & Sugai, 2000; Pepler, Craig, & Roberts, 1998). Teachers often are seen socializing with each other while their students are playing at recess with minimal supervision (Kendrick, Hernandez-Reif, Hudson, Jeon, & Horton, 2010). Further, because teachers often view recess supervision as a negative task, schools have begun to have paraprofessionals serve as supervisors who typically have less formal training in managing student behavior than certified staff (Nelson, Smith, & Colvin, 1995).

**Assessing supervision.** Adult supervision has typically been assessed using third party observations of supervisors’ activities and through surveys and questionnaires completed by the supervisors. For example, in an effort to improve lunch and recess time
for students by empowering supervisors, Nabors, Leff, and Power (2004) administered a supervisor questionnaire pre- and post-intervention. The intervention called for supervisors to routinely clarify schools rules, provide active supervision, and promote age- and gender-appropriate recess activities. Supervisors reported higher levels of active monitoring and better communication and teamwork among colleagues at the posttest (Nabors et al., 2004).

In the Nabors et al. study, supervision practices were assessed using supervisor questionnaires. Alternatively, in a multiple baseline across recess periods and across adult supervisors study that examined active versus inactive supervision practices, Lewis, Colvin, and Sugai (2000) observed recess supervisors’ interactions with students on the playground. Data collectors recorded the frequency with which supervisors moved beyond fifteen feet from the previous location they were standing in, interacted with students, interacted with adults, and whistled or made gestures towards students who were ten or more feet away from them. Results indicated a reduction in the frequency of problem behaviors displayed by students across recess periods and an increase in the frequency of active supervision displayed by supervisors across recess periods. This study aimed to assess supervision practices at recess across conditions.

**Relation Among Peer Conflict and Supervision**

Several studies suggest that more frequent supervision of students on the playground decreases problem behaviors, injuries, and bullying (Franzen & Kamps, 2008; Schwebel, Summerlin, Bounds, & Morrongeillo, 2006). Roderick, Pitchford, and Miller (1997) showed that providing frequent supervision and reinforcement for positive play at recess was related to reduced rates of aggressive behavior (e.g., kicking was
reduced by 75% and hitting was reduced by 47%). In this study, the presence of an adult was confounded with active encouragement of positive play and, thus, the authors could not decisively state that an adult presence without encouragement would have also led to positive results. However, other studies have also demonstrated that adult supervision leads to positive outcomes for students. Lewis, Colvin, & Sugai (2000) demonstrated that increasing frequency of adult supervision reduced the frequency of problem behaviors that occurred at recess. Similarly, Leff, Costigan, and Power (2004) suggested that frequent adult supervision led to more interactions between children of different ethnicities allowing students to branch out from the comfort of their defined social groups. Taken together, these studies suggest that frequent adult supervision can reduce problem behaviors and assist in developing positive relationships among students.

Students report that substantial peer conflict occurs away from adult attention and supervision during recess. Even when there are adults monitoring recess, most aggressive and bullying behaviors at recess deliberately occur away from the ears and watchful eyes of teachers (Doll & Brehm, 2010; Olweus, 1993). Craig and Pepler (1997) found that bullying occurs at recess once every seven minutes and adult supervisors only intervened in 4 percent of the bullying incidents. In particular, they suggest that adults are often unaware of the verbal conflict that occurs between students due to the noise on the playground. Similarly, Pellegrini (1993; 1995; 2005) suggested that students who engage in physical aggression may choose to do so in the hidden areas of the playground that are out of the sight of adult supervisors. Doll and Brehm (2010) described anecdotal reports explaining where and why peer conflict occurs in areas on the playground that are outside of adult vision. For example, one student reported that adults usually stand in predictable
locations on the playground making it easier for students to recognize minimally supervised areas. These areas quickly become locations in which peer conflict is most likely to happen. Other evidence shows that rates of peer conflict drop when the ratio of supervisors per students increases and there are more adults available to supervise student behavior (Pellegrini & Blatchford, 2000; Siemers, 2006). Overall, the playground locations that have minimal supervision are reported by students to have more peer conflict (Doll & Brehm, 2010; Siemers, 2006).

**Locations and Student Peer Interactions**

Student perceptions of peer conflict differ across schools. Dooley, Doll, Chadwell, and Turner (2011) compared student reports of peer relationships, peer conflict, and worries about bullying across three schools. A total of 730 elementary students in second, third, fourth, and fifth grades completed selected subscales of the ClassMaps Survey (Doll, Spies, et al., 2010) that measures peer friendships, peer conflict, and students’ worries about peer aggression. Demographics across the schools varied (i.e., School A was 19% minority students, 57% eligible for free/reduced meals. School B was 11% minority students, 22% eligible for free/reduced meals. School C was 18% minority students, 19% eligible for free/reduced meals). An ANOVA was completed for each subscale in order to determine if there were school effects. Results demonstrated a significant school effect for all 3 subscales. A post hoc test (i.e., Tukey’s HSD) was completed to further understand the differences between the schools. Students in School B indicated stronger peer relationships than students in School A and students in School C indicated fewer worries about bullying than students in School A. Small to medium
effect sizes were found. In summary, these results suggest that school contexts could be related to the nature of students’ interactions during recess.

Students’ perceptions of peer conflict differ within schools as well. Astor and colleagues (2001) asked 377 students in grades 2, 4, 6, and 8 from 5 elementary and 2 middle schools to indicate where peer conflict occurs at school. In the sample of students, 67% were male, 51% identified as African American, 40% identified as Caucasian, 5% were Latino(a), and 82% of the students received free or reduced-price lunch. Students were given simple blueprint maps that depicted the internal and external areas of their school building. Trained interviewers conducted an unstructured interview with study participants to ask them to indicate places on the map of the school that they thought were unsafe or dangerous. The authors’ goal was to contrast the data between elementary and middle schools, among grade levels, and among subcontexts within the schools. Each student’s map and interview were individually coded. Nonparametric statistical analyses were performed to determine if there were more specific subcontexts identified by middle school students. Grade-level analyses were performed with planned and post-hoc pairwise contrasts between grade levels in elementary and middle schools. Finally, to examine the school differences, chi-square analyses were performed.

Results showed that more elementary students than middle school students nominated external building locations (e.g., the playground) as unsafe locations. Grade level did affect students’ perceptions of conflict-prone locations in that students in different grades identified different school locations as problematic. Importantly, students’ perceptions were most similar to the other students in their school rather than to their grade alone. More specifically, when the elementary school included kindergarten
through sixth grade students, the sixth graders’ perceptions of unsafe locations were similar to those of the younger students in their school. Comparatively, in the districts that included sixth graders in the middle school building, the sixth graders’ perceptions were more similar to other middle schoolers’ perceptions than to student perspectives in the elementary school. Overall, both school type and grade level influenced students’ perceptions of peer conflict.

Astor and colleagues (1999) assessed where violence occurred at school using a similar methodology. Specifically, 78 high school students were asked to indicate on a map of the internal and external areas of their school where violent events (e.g., physical fights, sexual assaults, violence with a weapon) had occurred within the past year. Then, on a separate but identical map, students were asked to mark locations that they perceived as unsafe or dangerous. Trained interviewers completed structured interviews with students to gather further information regarding the specific violent events and unsafe locations they indicated on their map. A database was created using the students’ grade, gender, map events, times, locations, and descriptions of the violent events that occurred within the specific locations. A visual representation was developed by the researchers to display how the reported events clustered by time, grade, gender, and location. From a theoretical perspective, this demonstrated the co-occurrence of school violence and physical structure, time, and the grade and gender of the students. Female students reported more school locations as unsafe or dangerous. Overall, the locations and times where violence was reported in high schools appeared to interact with the grade and gender of the students.
Researchers interested in bullying behaviors (a subset of aggressive behaviors that includes types of peer conflict) have asked students to self-report via survey or interview about the locations where bullying is likely to occur at their school. For instance, Smith and Shu (2000) asked 2,308 students (ages 10-14 years) from 19 schools in England where they were bullied at school in the last 6 months. Students were allowed to provide more than one location in response to the question. The researchers found that the majority of students surveyed indicated that the playground (65%) was where they were bullied at school. The next top locations identified by students were classrooms (61% of students) and hallways (37% of students). Differences between boys’ and girls’ reports were noted, but were small. Also, younger students were more likely than older students to indicate that the playground was a location for bullying behaviors.

Wolke, Woods, Stanford, and Schulz (2001) interviewed 2,377 students in England (6 and 8 year olds) and 1,538 students in Germany (8 year olds) in order to determine where they were bullied at school. In England and Germany, the most common location where students indicated they were bullied was the playground. Specifically, 93% of 6 year olds and 92% of 8 year olds in England and 92% of 8 year olds in Germany chose the playground. These percentages are especially high when compared to the second most common location: the classroom, at 29%, 33%, and 26%, respectively. Significantly more girls than boys reported being bullied in the classroom in England ($\chi^2 (1, 1287) = 14.8, p < .000$; girls = 37.5%, boys = 27.5%), while no gender differences were found for the locations in Germany. The students ranked the bullying behaviors similarly in both countries with either verbal (called ‘nasty names’) or physical aggression (‘beaten’) being the most frequently experiences, followed by relational
aggression (‘spreading nasty lies’) and theft. Overall, the researchers in this study found that students who bully were more likely to be boys, older than 7 years, low/middle SES, and live in Germany (rather than England). Students who were victims of bullying were more likely to be boys, low/middle SES, live in England (rather than Germany), live in rural areas (as opposed to urban areas), and be from an ethnic minority background (rather than Caucasian).

Similarly, Vaillancourt et al. (2010) surveyed 5,493 girls and 5,659 boys in Canada in grades 4 to 12 in order to identify the locations where bullying occurred at their schools. Students in elementary schools indicated that the playground was the most common area for bullying to occur. Secondary students indicated three areas as likely locations for bullying behaviors to occur: the hallway, cafeteria, and the school’s outside grounds. The researchers suggested that all of the areas identified by students were not well supervised by adults and that increased supervision practices in these areas might positively affect students’ behavior.

These studies examining student peer interactions at school are important in understanding which locations appear to be prone to peer conflict and positive play experiences.

**Map Procedure**

A mapping procedure similar to that used in Astor et al.’s (1999; 2001) studies will be used in the current study to gather students’ perspective about where peer conflict and positive play occur at recess. Mapping is a strategy that is frequently used by police departments to examine high crime areas within their patrol sector (Paulsen, 2004). Crime maps help officers determine local crime patterns and how resources should be
allocated, as well as assist in forecasting geographical locations of future crimes (Paulsen & Robinson, 2004). The data generated from the maps help determine ‘hot spots’ where crime has occurred and, thus, where crime is likely to occur in the future. This information is used by police to apply problem-solving techniques to reduce crime at these specific locations (Paulsen, 2004). Using data to inform decision making about resources and strategies frequently results in reduced crime.

Crime mapping techniques can be as simple as dividing a map of the city into a square grid and then counting the number of incidents within each square (Block, 2000). This technique was used by Block (2000) to determine the frequency and severity of crimes committed by different gangs in Chicago. Additionally, the Minneapolis Hot Spots Experiment was conducted to determine if preventative patrol would be most effective if police officers focused on crime hot spots as determined by crime mapping (Sherman & Weisburd, 1995). Since then, this technique has been used in several other cities in the United States, all of which have shown that policing hot spots is a more effective approach than standard policing practices and that the crime is generally not displaced to nearby areas (Weisburd & Lum, 2005).

Research has demonstrated a strong relation between violence and the physical and social environment in which it occurs in settings such as housing projects, prisons, and college campuses (Day, 1994; Fisher & Nasar, 1992; Perkins, Meeks, & Taylor, 1992; Stokols, 1995). Specifically, crimes and conflict were likely to occur in undefined spaces or places that people did not view as any one individual’s personal responsibility (Newman, 1995). In housing projects, Newman found that undefined spaces such as lobbies and hallways were prone to peer conflict. When spaces are clearly defined and a
sense of responsibility for the space exists, conflict is likely to be reduced within the context (Astor et al., 1999; Behre, Astor, & Meyer, 2001). Several community interventions have been designed to target specific physical locations and organize groups to take ownership of these areas in order to reduce crime (Day, 1994; Fisher & Nasar, 1992; Perkins et al., 1992; Stokols, 1995). Research has shown that purposely monitoring spaces that are identified as dangerous, or locations where conflict occurs, drastically reduces the amount of crime and conflict that occurs there (Feins, Epstein, & Widom, 1997; Newman, 1995; Taylor, 1997).

This crime research may be useful for understanding school environments. Within the school setting, students often view classroom spaces as a shared responsibility between themselves and the teacher, but view other physical school spaces as undefined spaces not owned by students nor their teachers (Astor et al., 1999). For example, teachers may not interact with students in certain places (e.g., the playground) unless they have a specific assignment to do so (e.g., recess duty). Territoriality occurs when a person shows control over a specific location, which appears to influence school violence due to the clusters of peer conflict that occur at certain times and in certain locations within a school (Astor et al., 1999; 2001).

Several studies (Astor et al., 1999; Astor, Benbenishty, & Meyer, 2004; Astor, Meyer, Benbenishty, Marachi, & Rosemond, 2005; Dooley et al., 2011; Zumbrunn et al., 2013) have applied principles of crime mapping to the school setting. Zumbrunn and colleagues (2013) gave maps detailing the internal and external school structures to 282 students in third, fourth, and fifth grades who attended an elementary school. Students were asked to place three red stickers where kids do not get along and three green stickers
where kids do get along. Descriptive analyses were used to determine the frequency with which locations were marked with red and green stickers. Pearson’s chi-square test was conducted to determine grade and gender differences in each location. Results suggested that there were no gender differences with regard to locations that students identified for “kids do get along” and “kids do not get along’ and differences across grade levels were small. Specifically, significantly fewer 5th grade students, as compared to 3rd and 4th grade students, nominated the playground as a place where students do get along ($\chi^2 (34, 846) = 72.66, p < .001$) and stairwells as locations where students do not get along ($\chi^2 (36, 846) = 89.10, p < .001$). Similar to prior studies (Astor et al., 1999; Astor et al., 2001) students indicated that the playground, restrooms, and the cafeteria were conflict-prone locations. Students indicated that positive peer interactions occur in the classrooms, gymnasium, library, cafeteria, computer room, and on the playground. It is noteworthy that students identified the playground as a place where students do get along, as well as a location where they do not get along.

Given the interesting result regarding the playground from Zumbrunn’s study, Dooley, Doll, Jones, and Wimmer (2011) gave 301 second through fifth grade students maps that detailed the main structures of their school playground. Students were asked to indicate places where “kids get along” by placing three green stickers and where “kids don’t get along” by placing three red stickers on the map of the playground. Similar to Zumbrunn’s study, descriptive analyses were used to determine the frequency of locations being marked with red and green stickers. Results indicated that the five most frequently selected locations where peer conflict occurred were the same as the top five most frequently selected locations for where positive play occurred. Further, the most
frequently selected location where “kids get along” and where “kids do not get along”
was the same (i.e., the playground equipment). In order to determine differences by grade
for each of the top five locations, chi-square values were examined. (The chi-square test
assumes that each cell’s expected frequency is five or more and was only used when this
assumption was met. When it was not, the Fisher’s Exact Test was reported.) Significant
grade differences were noted for three of the five top locations for where students do get
along (Equipment: $X^2 (9, 301) = 21.77, p < .01$; Four-square court: $X^2 (6, 301) = 80.85, p
< .001$; Basketball Court: $X^2 (6, 301) = 21.67, p < .001$) and in all five locations for where
students do not get along (Equipment: $X^2 (9, 301) = 43.98, p < .001$; Open gravel area: $X^2
(9, 301) = 64.60, p < .001$; Four-square court: $X^2 (6, 301) = 62.42, p < .001$; Basketball
Court: $X^2 (6, 301) = 21.47, p < .001$; Under the tree: $X^2 (9, 301) = 94.19, p < .001$). These
findings raise the possibility that peer conflict and positive play may both occur where
students are frequently playing. Thus, locations for playground conflict may not be ‘hot
spot’ locations in the same sense as suggested by community crime statistics. Limitations
of Dooley et al.’s (2001) study included that all students were from one school and
students were not asked where adult playground supervisors were located during recess
time. Therefore, it was impossible to tell whether the places in which students did and did
not get along were locations where teachers were often located. As a result, conclusions
could not be made regarding students’ reports of peer conflict and positive play in areas
where there was frequent adult supervision on the playground.

In the present study, peer conflict and positive play were operationally defined in
students’ vernacular. Specifically, peer conflict was operationally defined as “kids not
getting along” and positive play was operationally defined as “kids getting along.” These
definitions were used to capture all forms of peer conflict and positive play that occurred during recess. Additionally, supervision locations were defined as “where the adults are” in order to evaluate student reports of behaviors that occurred in the areas where adult supervisors were located.

One question that could be raised is whether the terms that were used in the current study were accurate, inclusive operational definitions. As previously discussed, important peer conflict terms such as aggression are clearly and precisely defined in the professional literature. However, there is evidence that suggests that students are not using such precise definitions when asked about their own experiences with peers (Bieber, 2013; Kert, Codding, Tryon, & Shiyko, 2010; Monks & Smith, 2006; Smith et al., 2002; Vaillancourt et al., 2008). Thus, the current study used developmentally appropriate language so that students were able to understand the terms and accurately report where conflict and positive play occur.

**Research Questions and Hypotheses**

The purpose of this study was to examine variables that are related to where peer conflict occurs during recess including playground supervisor locations, locations of positive play, student gender, student grade level, and school (see Table 5 for specific information about the variables measured). The location in which students spend most of their time was included as a predictor in order to control for the possibility that students in different grades may spend different amounts of time in the same location. This study was specifically designed to answer the following questions:

1. Is the location of playground peer conflict related to the location where adult supervisors stand?
2. Is the location of playground peer conflict related to the location where positive play occurs?

3. Do male and female students identify different locations where peer conflict occurs?

4. Is the location of playground peer conflict related to students’ grade level?

5. Are there differences between schools that affect where peer conflict occurs?

It was hypothesized that:

1. Proximity to adult supervisors would affect where peer conflict occurs at recess.
   a. The locations where adult supervisors stand would not be the same locations as where peer conflict occurs.

2. Locations where positive play occurred would affect where peer conflict also occurred at recess.
   a. The locations where students report positive play would be the same locations where they reported peer conflict occurred.

3. Students’ reported gender would not be related to where peer conflict occurred at recess.

4. Students’ reported grade would not be related to where peer conflict occurred at recess.

5. School differences would be related to where peer conflict occurred at recess.
CHAPTER 3: METHOD

This study used logistic regression to examine variables that predicted locations where peer conflict occurred during recess. The following research question was investigated in this study: To what degree are the following variables related to where peer conflict occurs during recess: proximity to adults, location of positive play, students’ gender, students’ grade, and students’ school? Data included student marked playground maps showing where students do and do not get along, where adult supervisors stand at recess, and where students spend most of their time at recess. Students provided self-report of their grade, gender, and school. The research hypothesis was that grade and gender would not be related to where peer conflict occurred at recess, but that the school, proximity to adults, and the location of positive play would be related to where peer conflict occurred. The null hypothesis was none of the variables would be related to the locations where peer conflict occurred.

Participants

Schools were included in the study if all students in second through fifth grades were provided a recess period and each recess period included all students in the same grade (i.e., all second grade students had recess at one time). Students were included in the study if they were in second, third, fourth, or fifth grade at one of the participating schools, their parents did not object to them participating in the study, and the students’ provided their verbal assent.

Participants included 1043 second, third, fourth, and fifth grade students in three participating schools. The total number of student participants included 472, 197, and 374 students from Schools A, B, and C, respectively. The total number of student participants
Table 1

*Student Participants*

<table>
<thead>
<tr>
<th></th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; grade</td>
<td>121</td>
<td>61</td>
<td>90</td>
<td>272 (26.1%)</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; grade</td>
<td>132</td>
<td>49</td>
<td>76</td>
<td>257 (24.6%)</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>109</td>
<td>45</td>
<td>98</td>
<td>252 (24.2%)</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>110</td>
<td>42</td>
<td>110</td>
<td>262 (25.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>472</td>
<td>197</td>
<td>375</td>
<td>1043</td>
</tr>
</tbody>
</table>

|               |          |          |          |        |
| Gender        |          |          |          |        |
| Males         | 240      | 89       | 188      | 517 (49.6%) |
| Females       | 231      | 108      | 185      | 524 (50.2%) |
| Total         | 471      | 197      | 373      | 1041 (99.5%) |

*Percentages based on total number of participants.

accounted for just over half of the total student enrollment in each school. Demographic information on participants is included in Tables 2 and 3. A total of 517 students identified themselves as male (240 from School A, 89 from School B, and 188 from School C) and 524 students identified as female (231 from School A, 108 from School B, and 185 from School C), with two students who did not indicate their gender. These numbers indicate 49.6% of the total participants identified themselves as male, while 50.2% identified themselves as female. Across all three schools, a similar number of students participated across grades: 272 second graders (26.1%), 257 third graders (24.6%), 252 fourth graders (24.2%), and 262 fifth graders (25.1%) participated in the
study. More specifically, participants from School A included 121 second graders, 132 third graders, 109 fourth graders, and 110 fifth graders; School B included 61 second graders, 49 third graders, 45 fourth graders, and 42 fifth graders; School C included 90 second graders, 76 third graders, 98 fourth graders, and 110 fifth graders. See Table 1 for full demographic data as reported by the student participants.

**Student demographic information as reported by the schools.** School A was located in a small, rural, Midwestern town with an overall population of slightly more than 6,000. The total enrollment for the elementary school was slightly under 800 students. There were 142 students enrolled in second grade, 141 students in third grade, 122 fourth graders, and 122 students in fifth grade. Eighty seven percent of the school population received free or reduced lunch. Over 80% of the student population was Latino/Latina, but the specific percentages varied by grade. Similarly, the percentage of students identified as English Language Learners varied by grade, but ranged from 27 to 70 percent. The variability between grades was much less for students receiving Special Education services, as percentages ranged from nine to twelve percent. Table 2 contains full demographic data for the students enrolled in each participating grade.

School B was located in a mid-sized, Midwestern city with an overall population of more than 265,000. The total enrollment for the elementary school was almost 350 students with a majority of the student population identified as Caucasian. Ninety percent of the students enrolled in School B received free or reduced lunch. Twenty six percent of students were English Language Learners, just over 15 percent received Special Education services, and a little over two percent were identified as Gifted. See Table 2 for demographic information reported by the school.
Table 2

*School Demographic Data*

<table>
<thead>
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<th>Characteristic</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
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</thead>
<tbody>
<tr>
<td>Student enrollment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} grade</td>
<td>142</td>
<td>66</td>
<td>103</td>
</tr>
<tr>
<td>3\textsuperscript{rd} grade</td>
<td>141</td>
<td>51</td>
<td>102</td>
</tr>
<tr>
<td>4\textsuperscript{th} grade</td>
<td>122</td>
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<td>117</td>
</tr>
<tr>
<td>5\textsuperscript{th} grade</td>
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<td>121</td>
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<tr>
<td>Ethnicity</td>
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</tr>
<tr>
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<td>42.5%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>13.4% (3\textsuperscript{rd})</td>
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<td>8.2% (4\textsuperscript{th})</td>
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</tr>
<tr>
<td></td>
<td>6.6% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino/Latina</td>
<td>86% (2\textsuperscript{nd})</td>
<td>28.7%</td>
<td>20%</td>
</tr>
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<td>84% (3\textsuperscript{rd})</td>
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<tr>
<td></td>
<td>85% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>0.7% (2\textsuperscript{nd})</td>
<td>13.2%</td>
<td>12.6%</td>
</tr>
<tr>
<td></td>
<td>0% (3\textsuperscript{rd})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.01% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.6% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1.4% (2\textsuperscript{nd})</td>
<td>3.8%</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>0% (3\textsuperscript{rd})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.01% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.6% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more races</td>
<td>---</td>
<td>11.1%</td>
<td>10.4%</td>
</tr>
<tr>
<td>American Indian</td>
<td>---</td>
<td>&gt;1%</td>
<td>.1%</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>---</td>
<td>---</td>
<td>.1%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>48% (2\textsuperscript{nd})</td>
<td>50.4%</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>46% (3\textsuperscript{rd})</td>
<td>49.6%</td>
<td>49%</td>
</tr>
<tr>
<td></td>
<td>54% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive free or reduced lunch</td>
<td>87%</td>
<td>90%</td>
<td>81%</td>
</tr>
<tr>
<td>English language learners</td>
<td>70% (2\textsuperscript{nd})</td>
<td>26%</td>
<td>17.6%</td>
</tr>
<tr>
<td></td>
<td>41% (3\textsuperscript{rd})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>47% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special education</td>
<td>9% (2\textsuperscript{nd})</td>
<td>15.5%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>11% (3\textsuperscript{rd})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12% (4\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12% (5\textsuperscript{th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gifted</td>
<td>---</td>
<td>2.6%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Note.* (---) denotes information not reported by the school.

School C is located in the same mid-sized, Midwestern city as School B. The total enrollment for the elementary school was roughly 700 students. Eighty one percent of the school population received free or reduced lunch. Over half of the students were Caucasian with the next highest percentage of students identified as Latino/Latina. The percentage of students who were English Language Learners was 17.6%. Fourteen percent of students received Special Education services and 5% of students were identified as Gifted. Overall percentage of males and females was 51% males and 49% females. Table 2 contains full demographic data as reported by the school.

**Playground and recess differences.** There were several differences between the playgrounds and recess periods across the three schools. First, the size of the playgrounds...
varied. School A’s playground was over twice as large as School B and School C’s playgrounds. Second, the number of students on the playground during recess differed across schools. This was due in part to the differences in student enrollment; however, there were also differences in the number of recess periods each school had for the four grades that participated in the study. School A had three recess periods (2<sup>nd</sup> grade alone, 3<sup>rd</sup> and 4<sup>th</sup> grades together, and 5<sup>th</sup> grade alone) while Schools B and C both had four recess periods (one separate recess period for each grade). Third, the number of adults who supervised recess ranged from two to four depending on the school. Table 3 includes playground and recess differences between schools included in this study.

Table 3

*Playground and recess differences between schools*

<table>
<thead>
<tr>
<th></th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate size of playground (in sq. ft.)</td>
<td>75,000</td>
<td>31,500</td>
<td>30,000</td>
</tr>
<tr>
<td>Grades included at each recess period</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; alone</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; alone</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; alone</td>
</tr>
<tr>
<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; &amp; 4&lt;sup&gt;th&lt;/sup&gt; together</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; alone</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; alone</td>
</tr>
<tr>
<td></td>
<td>5&lt;sup&gt;th&lt;/sup&gt; alone</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; alone</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; alone</td>
</tr>
<tr>
<td></td>
<td>5&lt;sup&gt;th&lt;/sup&gt; alone</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; alone</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; alone</td>
</tr>
<tr>
<td>Number of students at each recess period</td>
<td>142 2&lt;sup&gt;nd&lt;/sup&gt; graders</td>
<td>66 2&lt;sup&gt;nd&lt;/sup&gt; graders</td>
<td>103 2&lt;sup&gt;nd&lt;/sup&gt; graders</td>
</tr>
<tr>
<td></td>
<td>263 3&lt;sup&gt;rd&lt;/sup&gt; &amp; 4&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>51 3&lt;sup&gt;rd&lt;/sup&gt; graders</td>
<td>102 3&lt;sup&gt;rd&lt;/sup&gt; graders</td>
</tr>
<tr>
<td></td>
<td>122 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>47 4&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>117 4&lt;sup&gt;th&lt;/sup&gt; graders</td>
</tr>
<tr>
<td></td>
<td>50 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>50 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>121 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
</tr>
<tr>
<td>Number of adult supervisors at recess</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Measures**

**Maps.** A modified map procedure was used to draw a map of each school’s playground (Astor et al., 1999; Astor et al., 2001). Research assistants visited the three
schools to make a sketch of the major playground features (e.g., trees, major play structures, blacktop, fields). This sketch was then converted into a line drawing of the playground that depicted the major playground structures. The school psychologist at each school reviewed the map to make sure that all major features of the playground were present on the map. Changes suggested by the school psychologists were made before the map was distributed to students in the school. See Figures 1, 2, and 3 for the playground maps that were used for data collection for the three schools. At the top of each map, students indicated their gender and grade by circling the appropriate choice.

In two schools, from the time that the maps were drawn and approved by the corresponding school’s staff to the time that the students completed the maps, no major playground modifications were made. However, for School A a new piece of equipment was added to the playground. This piece of equipment was not included on the playground map when the students placed their stickers. However, before students were instructed to place their stickers on the map, the researchers instructed the students to place their finger where the new equipment was located so that all students were aware of and oriented to the location of the new equipment. The new equipment was smaller in size to the main equipment area and so it was coded as the ‘Secondary Equipment’ location, while the main equipment area was coded as the ‘Large Equipment’ area. See Figures 1 and 4 for a comparison of the playground map distributed to students and the playground map that was used for coding purposes, which incorporated the new equipment location.
Procedures

The procedures for this study were approved as part of the ClassMaps consultation approval. See Appendix A and B for the English and Spanish Parent notice forms, respectively. See Appendix C for the Teacher Consent form.

School and staff consent. The primary investigator electronically mailed a one-page brochure about the project and an invitation to participate in the study to elementary schools across the state of Nebraska. Invitations to participate were sent to school administrators (e.g., school principals, school psychologists) with whom there had been previous research contact. When an administrator agreed that students in the school could be involved in the study, they then wrote a letter of support for the study that was given to the University’s Institutional Review Board. Additionally, another letter of support from a district representative (e.g., superintendent, research coordinator) was secured and provided to the IRB.

Once three schools were identified for participation in the study, second, third, fourth, and fifth grade homeroom teachers were recruited for the study. Teachers were provided with the one page informational brochure about the study. All teachers who participated in classroom data collection occurred in signed consent forms. All second, third, fourth, and fifth grade teachers in the three schools consented for data collection to occur within their classrooms.

Parent notice. Parents were sent written notices in English and Spanish describing the study for all students in the second, third, fourth, and fifth grades in participating schools. Parents who did not want their children to participate contacted the school and/or the study investigators and could opt out of the study. Parents were given
the right to refuse participation without penalty to them or their child. One parent from School C indicated that they did not want their child to participate in the study and so the student was given a separate activity to complete while the rest of the students in that classroom participated in the study.

**Student assent.** Since the data were collected anonymously, students verbally assented to participate before providing any data for the study.

**Data collection.** Once students had given their verbal assent, they were given a map of their school’s playground, one green sticker, one red sticker, one yellow sticker, and one blue sticker. A research assistant read the demographic questions to the students and instructed them to self-report their grade and gender by circling the appropriate option in the demographics section at the top of the map. Then, the playground map directions were read aloud instructing students to think about the last two weeks and then place the green sticker where kids get along at recess, the red sticker where kids do not get along at recess, the yellow sticker where adults stand at recess, and the blue sticker where kids spend most of their time at recess. Another adult (a second research assistant, teacher, or school psychologist) circulated around the classroom to answer any questions the students had. Once the students placed their stickers on their map, the research assistants collected the maps.

**Dividing the playground maps.** The primary researcher examined all of the playground maps in order to determine areas that each school had in common (e.g., basketball court, grass area). There were a total of six common playground locations among all three schools: the large playground equipment, basketball court, open grass area, climbing structure, transportation structure (car, bus, duck), and secondary
equipment. In addition, there were also two locations that were common across two schools: the soccer field and four square court areas. Figures 4, 5, and 6 contain playground maps divided into areas and labeled with the common playground areas. For each school, a transparency of the playground map was marked with that playground’s common areas. Each of the locations was assigned a numeric code. The transparency was used to code the areas on the map where the students placed their stickers. A transparency was placed over the students’ map and then each sticker was coded with the number of the area where the sticker had been placed. The locations where the red, green, yellow, and blue stickers were placed were entered into a database for each student’s map.

**Data entry.** Before data entry occurred, the primary researcher assigned each school, teacher, and student individual identification codes. Also, each grade and gender

Table 4

**Number of Stickers Per Location**

<table>
<thead>
<tr>
<th>Location</th>
<th>Green</th>
<th>Red</th>
<th>Yellow</th>
<th>Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>343</td>
<td>97</td>
<td>247</td>
<td>241</td>
</tr>
<tr>
<td>Basketball court</td>
<td>88</td>
<td>105</td>
<td>152</td>
<td>61</td>
</tr>
<tr>
<td>Open grass</td>
<td>37</td>
<td>62</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>41</td>
<td>39</td>
<td>263</td>
<td>42</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>51</td>
<td>63</td>
<td>36</td>
<td>27</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>202</td>
<td>117</td>
<td>119</td>
<td>339</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>36</td>
<td>217</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>73</td>
<td>201</td>
<td>60</td>
<td>74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>871</strong></td>
<td><strong>901</strong></td>
<td><strong>928</strong></td>
<td><strong>909</strong></td>
</tr>
</tbody>
</table>
were assigned codes for data entry purposes. Data for each map included the presence (1) or absence (0) of a red sticker, green sticker, yellow sticker, or blue sticker for each school location, as well as the individual school, teacher, and student code and the students’ appropriate gender and grade codes.

Any stickers that were placed in an uncodable area (e.g., on the directions or in the area designated as the school building) or within areas that were not included in the common playground locations were not included in the analyses for this study. With this method, 84 percent of potential green stickers, 86 percent of potential red stickers, 89 percent of potential yellow stickers, and 87 percent of potential blue stickers were included in the analysis. See Table 4 for full details as to the number of stickers placed in each of the eight common playground locations.

**Interrater agreement.** Each student map was coded by at least one member of the research team to determine the locations of each red, green, yellow, and blue sticker. A graduate student researcher was trained using maps from a previous study to reach 98 percent agreement with the principal investigator who served as the primary coder. Once proficiency had been reached, the graduate student researcher began coding the maps. When the principal investigator had coded all maps once, another graduate researcher randomly selected approximately 25 percent of the maps (a total of 273 maps) to independently code. Intercoder agreement was analyzed using Cohen’s kappa (k) scores (Cohen, 1965). This method is preferred over other agreement assessments, as it corrects for chance agreements (Kazdin, 1982). Using the kappa statistic, a value of 1 indicates perfect agreement and a value of 0 indicates agreement no better than chance. Values greater than .60 are considered substantial (Landis & Koch, 1977). In this study, Cohen’s
kappa scores describing interrater agreement were found to range from .77 and 1.00, indicating strong agreement.

**Data Analyses**

Logistic regression was used to determine if the location of peer conflict (placement of the red sticker) was related to student variables (i.e., gender, grade, school), adult supervisors’ location (yellow sticker), and location of positive play (green sticker). Logistic regression is preferred for studying the relation between a dichotomous variable and predictor variables (Pampel, 2000). Further, logistic regression allows for prediction of the probability of the dependent variable to occur given information from the predictor variables. Logistic regression was an appropriate analysis for this study for several reasons. First, the outcome variable was dichotomous (the red sticker was placed in the location or it was not) and several of the predictors were categorical variables. Given that there was only one dichotomous outcome variable, the error terms were independent of each other. Further, since all of the data points were independent of each other, there were no overly influential data points. The number of participants in this study was rather large, suggesting that the reliability of the estimations was valid.

Separate logistic regressions were completed for each of the eight common playground locations in order to determine the relation between the predictor variables and the outcome variable (i.e., location of peer conflict) within that location. The outcome variable was dichotomous in that the red sticker was either in the location or it was not. In other words, students indicated that peer conflict occurred in that location or they did not. Logistic regression was used to determine the probability of peer conflict
### Table 5

**Variables Measured**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measure</th>
<th>Nature of Data</th>
<th>Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>Self-report</td>
<td>Nominal</td>
<td>2 to 5</td>
</tr>
<tr>
<td>Gender</td>
<td>Self-report</td>
<td>Dichotomous Nominal/Categorical</td>
<td>Female, Male 0, 1</td>
</tr>
<tr>
<td>School</td>
<td>Researcher report</td>
<td>Nominal/Categorical</td>
<td>Name of School 1 to 3</td>
</tr>
<tr>
<td>Location of Adults</td>
<td>Yellow sticker location</td>
<td>Dichotomous</td>
<td>Is there a yellow sticker in each location No, Yes 0, 1</td>
</tr>
<tr>
<td>• Large equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Basketball court</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Open Grass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Climbing structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Transportation structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Secondary equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Soccer Field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Four Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location of Peer Conflict</td>
<td>Red sticker location</td>
<td>Dichotomous</td>
<td>Is there a red sticker in each location No, Yes 0, 1</td>
</tr>
<tr>
<td>• Large equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Basketball court</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Open Grass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Climbing structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Transportation structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Secondary equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Soccer Field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Four Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location of Positive Play</td>
<td>Green sticker location</td>
<td>Dichotomous</td>
<td>Is there a green sticker in each location</td>
</tr>
<tr>
<td>• Large equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Basketball court</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Open Grass
• Climbing structure
• Transportation structure
• Secondary equipment
• Soccer Field
• Four Square

Location Where Students Spend Most of Their Time
• Large equipment
• Basketball court
• Open Grass
• Climbing structure
• Transportation structure
• Secondary equipment
• Soccer Field
• Four Square

Blue sticker location  Dichotomous  Is there a green sticker in each location
No, Yes  0, 1

Zumbrunn and colleagues (2013) hypothesized that more student interactions in specific school locations increased the probability of both positive and negative social interactions. Moreover, if students spend most of their time in a specific location then occurring in specific locations given the predictors (i.e., students’ reported grade and gender, students’ school, where adult supervisors stand, location of positive play, and where students spend most of their time). Dummy coding was used for the predictors that contained more than two groups (i.e., grade, school). Results of the logistic regression described the probability (or odds) that peer conflict would occur in that location given other information (school, grade, gender, if adult supervisors are in that location, if positive play occurs in that location, and if students spent the most time in that location). See Table 5 for a full list of variables that were included in the study.
positive play and peer conflict are more likely to occur there than any other location on the playground. The location where students spend the most time (as indicated by students’ placement of the blue sticker) was included as a predictor variable in order to statistically account for high traffic playground locations.

The first hypothesis was that the location of adult supervisors would not be the same locations as where peer conflict occurred. The second hypothesis was that the locations of positive play were likely to be the same locations where students reported that peer conflict occurred. The third hypothesis was that students’ reported gender would not be related to the location of peer conflict. The fourth hypothesis was that students’ grade would not be related to the location of peer conflict. The fifth hypothesis was that the school would not be related to the locations of peer conflict at recess.

**Power Analysis**

Data from the study was analyzed using logistic regression to examine which variables were related to the location of peer conflict at recess. A power analysis was performed based on the research question to identify the minimal number of participants required to address the research question. Assuming a two-tailed test with alpha = .05, 400 participants across the three schools would provide approximately 73% power. The effect size that would be detected is slightly larger than a medium effect size (odds ratio equals 2.718).

The medium effect size that was detected from the power analysis used an odds ratio of 2.718. The odds ratio was important because it explains how one independent variable can affect the dependent variables. For example, for the variable of where adult supervisors were located, the question of importance was how an adult’s presence
changed the odds of peer conflict occurring in that particular location (e.g., the odds of peer conflict occurring on the basketball court was 2.718 times larger when positive play also occurred in that location).
CHAPTER 4: RESULTS

The following chapter describes the results of this study. First, the research questions and corresponding hypotheses investigated in this study will be reviewed. Second, preliminary analyses that examine the model fit for each location will be discussed. Then, the results of each research question will be described.

Hypotheses

Research question 1. Is the location of playground peer conflict related to the location where adult supervisors stand?

Hypothesis 1. It was hypothesized that the location where adult supervisors stand would be related to the location of peer conflict at recess. Specifically, it was hypothesized that the locations where adult supervisors stood would not be the same locations as where peer conflict occurred. This hypothesis was based on Doll and Brehm’s (2010) and Pellegrini’s (1993; 1995; 2005) research that found that students engage in peer conflict away from the watchful eyes of adult supervisors. Further, previous studies had demonstrated that the playground locations that had minimal supervision were described by students as having the most peer conflict (Doll & Brehm, 2010; Siemers, 2006). If this hypothesis was confirmed, the locations where peer conflict occurred (location of the red sticker) would not in the same location as where adult supervisors stood (location of the yellow sticker). The odds that peer conflict occurred in that location (placement of the red sticker) would be less if an adult supervisor was standing in that location (placement of the yellow sticker).

Research question 2. Is the location of playground peer conflict related to the location where positive play occurs?
Hypothesis 2. It was hypothesized that the location where positive play occurred would be related to where peer conflict also occurred at recess. This hypothesis was based on studies by Astor et al. (1999), Astor et al. (2001), Dooley et al. (2011), and Zumbrunn et al. (2013) who found that students identified the same school locations for peer conflict and the occurrence of positive play. If this hypothesis was confirmed, the location of peer conflict (placement of the red sticker) would be related to the occurrence of positive play (placement of the green sticker). The odds that peer conflict occurred in that location (placement of the red sticker) would be higher if positive play (placement of the green sticker) also occurred in that location.

Research question 3. Do male and female students identify different locations where peer conflict occurs?

Hypothesis 3. It was hypothesized that students’ reported gender would not be related to their descriptions of where peer conflict occurred at recess. This hypothesis was based on Astor et al. (2001), Dooley et al. (2011), and Zumbrunn et al. (2013) who found no gender differences in student reports of the locations where peer conflict was likely to occur in schools and on the playground. If this hypothesis was confirmed, the location of peer conflict would not be related to students’ gender. The odds that peer conflict occurred in a location (placement of the red sticker) would be the same for males and females.

Research question 4. Is the location of playground peer conflict related to students’ grade level?

Hypothesis 4. It was hypothesized that students’ reported grade would not be related to their indications of where peer conflict occurred at recess. This hypothesis was
based on Astor et al. (2001) and Zumbrunn et al. (2013) who found only small effect sizes for differences between grade levels. If this was confirmed, the location of peer conflict (placement of the red sticker) would not be related to students’ grade. The odds that peer conflict (placement of the red sticker) occurred in a location would be the same for each grade level.

**Research question 5.** Are there differences between schools that affect where peer conflict occurs?

**Hypothesis 5.** It was hypothesized that school differences would be related to students’ reports of locations where peer conflict occurred at recess. This hypothesis was based on Dooley et al. (2011) who found differences in student peer interactions across three different schools. If this hypothesis was confirmed, the location of peer conflict (placement of the red sticker) would be uniquely associated with each school in which the student was enrolled. The odds that peer conflict (placement of the red sticker) occurred in a location would be different for some students compared to other students based on the school that they attended.

**Preliminary Analyses**

Using the Statistical Analysis System (SAS) 9.3, logistic regressions were conducted for each of the common playground locations. There were a total of eight playground locations that were analyzed: (1) large equipment, (2) basketball court, (3) open grass, (4) climbing structure, (5) transportation structure, (6) secondary equipment, (7) soccer field, and (8) 4-square court. Of these locations, all three schools had six of the locations in common: large equipment, basketball court, open grass, climbing structure, transportation structure, and secondary equipment. School B did not have a 4-square
court so this school was not included in the analysis for that specific location. Similarly, School C did not have a soccer field and, therefore, was not included in the analysis for that location.

The overall fit of each of the models was tested. Six of the models were found to display acceptable fit to the data as demonstrated by the large model fit statistics ($-2 \text{ Log } L$ ranged from 332.702 to 926.611), suggesting that the specific model fit significantly better than an empty model (e.g., a model with no predictors).

Table 6

*Model Fit Statistics By Location*

<table>
<thead>
<tr>
<th>Location</th>
<th>$-2 \text{ Log } L$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>645.073</td>
</tr>
<tr>
<td>Basketball court</td>
<td>680.769</td>
</tr>
<tr>
<td>Open grass</td>
<td>464.475</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>332.702</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>475.513</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>727.654</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>842.310</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>926.611</td>
</tr>
</tbody>
</table>

Table 6 contains the model fit statistics for each location. The model fit values can range from 0 to positive infinity. The larger the value, the better the parameters perform in reproducing the observed data patterns and, therefore, the more improvement in the final model (Pampel, 2000). However, the initial models for two of the locations (the transportation structure and soccer field areas) were unable to converge due to quasi-
complete separation of the data points. Quasi-complete separation occurs when the
outcome variable separates a predictor or combination of predictor variables to a certain
degree. In the case of the soccer field, none of the students put their green and red
stickers together in this location causing some separation of data points. For the 63
students who placed red stickers within the transportation structure location, zero of them
also placed a green or yellow sticker in that location. Given this information, predictors
were dropped from the models that caused the quasi-separation of data: positive play
(green sticker) for both the transportation structure and the soccer field areas and the
location where adults stand (yellow sticker) was not included in the analysis for the
transportation structure. The results from these adjusted models will be explained below.

Further, the likelihood ratio chi-squares were large (ranging from 25.858 to
458.139) with \( p \)-values less than or equal to 0.003. See Table 7 for the likelihood ratio
results for each location. The likelihood ratio measures the probability of observing the
particular set of dependent variable values in that sample. The greater the chi-square
value, the greater the model improves over the baseline, and the less likely it is that the
variable coefficients equal 0 in the population (Pampel, 2000). The higher the likelihood
statistics, the higher the probability of observing the dependent variable values in the
sample. According to chi-square values in the current study, each of the models
demonstrated a statistically significant improvement over baseline. Taken together, this
suggests that the set of variables included within the models significantly improved the
model fit and that the remaining results can be interpreted.

Logistic regressions were conducted for each of the eight common playground
locations to determine which variables were significantly related to the locations where
peer conflict occurred. Specifically, binary logistic regression was used due to the dichotomous nature of the dependent variable: coded 1 (the red sticker, indicating peer conflict occurred there, was in that location) or 0 (the red sticker was not in that location).

Table 7

*Likelihood Ratio Statistics By Location*

<table>
<thead>
<tr>
<th>Location</th>
<th>Chi-Square</th>
<th>DF</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>68.769</td>
<td>9</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Basketball court</td>
<td>101.124</td>
<td>9</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Open grass</td>
<td>85.059</td>
<td>9</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>25.858</td>
<td>9</td>
<td>0.003*</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>100.976</td>
<td>7</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>103.072</td>
<td>9</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>52.594</td>
<td>7</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>458.139</td>
<td>7</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

*Note. DF = degrees of freedom*

* Significant at p < .01

Table 8 contains the resulting Type 3 Analyses of Effects, which demonstrates which predictors were significant for each of the eight common playground locations according to the chi-square statistic at the statistically significant .01 and .05 levels.

Given the Type 3 Analyses of Effects, the predictors that were found to be significant for each of the locations needed to be further explored to determine the meaning of the significant chi-square. Odds ratio estimates were conducted in order to estimate the degree to which the predictor influenced peer conflict. Odds ratios range from zero to positive infinity. The effect of the magnitude increases relative to the
### Table 8

**Type 3 Analyses of Effects**

<table>
<thead>
<tr>
<th>Predictor by Location</th>
<th>DF</th>
<th>Wald Chi-Square</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location where adult supervisors stand</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large equipment</td>
<td>1</td>
<td>0.650</td>
<td>0.420</td>
</tr>
<tr>
<td>Basketball court</td>
<td>1</td>
<td>0.136</td>
<td>0.716</td>
</tr>
<tr>
<td>Open grass</td>
<td>1</td>
<td>0.039</td>
<td>0.858</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>1</td>
<td>0.780</td>
<td>0.780</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>--</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>1</td>
<td>9.918</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>1</td>
<td>0.072</td>
<td>0.789</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>1</td>
<td>0.489</td>
<td>0.484</td>
</tr>
<tr>
<td><strong>Location of positive play</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large equipment</td>
<td>1</td>
<td>24.884</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Basketball court</td>
<td>1</td>
<td>6.158</td>
<td>0.013**</td>
</tr>
<tr>
<td>Open grass</td>
<td>1</td>
<td>1.945</td>
<td>0.162</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>1</td>
<td>0.527</td>
<td>0.468</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>--</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>1</td>
<td>20.471</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>--</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>1</td>
<td>9.042</td>
<td>0.003*</td>
</tr>
<tr>
<td><strong>Students' gender (males vs. females)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large equipment</td>
<td>1</td>
<td>5.828</td>
<td>0.016**</td>
</tr>
<tr>
<td>Basketball court</td>
<td>1</td>
<td>1.222</td>
<td>0.269</td>
</tr>
<tr>
<td>Open grass</td>
<td>1</td>
<td>0.140</td>
<td>0.709</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>1</td>
<td>1.371</td>
<td>0.242</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>1</td>
<td>16.310</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>1</td>
<td>0.459</td>
<td>0.498</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>1</td>
<td>12.141</td>
<td>0.001*</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>1</td>
<td>0.487</td>
<td>0.486</td>
</tr>
<tr>
<td><strong>Students' grade</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large equipment</td>
<td>3</td>
<td>14.023</td>
<td>0.003*</td>
</tr>
<tr>
<td>Basketball court</td>
<td>3</td>
<td>27.858</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Open grass</td>
<td>3</td>
<td>16.220</td>
<td>0.001*</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>3</td>
<td>4.608</td>
<td>0.203</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>3</td>
<td>33.985</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>3</td>
<td>4.827</td>
<td>0.185</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>3</td>
<td>20.969</td>
<td>0.001*</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>3</td>
<td>111.266</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>
School

<table>
<thead>
<tr>
<th>Predictor</th>
<th>N</th>
<th>Odds Ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>2</td>
<td>0.3921</td>
<td>0.822</td>
</tr>
<tr>
<td>Basketball court</td>
<td>2</td>
<td>46.818</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Open grass</td>
<td>2</td>
<td>25.881</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Climbing structure</td>
<td>2</td>
<td>11.215</td>
<td>0.004*</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>2</td>
<td>16.860</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>2</td>
<td>39.037</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>1</td>
<td>17.686</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>1</td>
<td>127.796</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

*Note. DF = degrees of freedom; (---) denotes a predictor that was not included in the model for that location.

* Significant at p < .01
** Significant at p < .05

The magnitude of the effect increases as the odds ratio increases (above one) and as the odds ratio approaches zero (below one). For interpretation purposes for this study, when the odds ratio was less than one, the inverse relation was calculated. This calculation was conducted by dividing one by the odds ratio. For example, if the odds ratio was 0.114 then if 1 were divided by .0114 then the odds ratio of the event not occurring would be 8.77, suggesting a large effect of the inverse relation. This allowed for comparison of the magnitudes of the effects because, with this correction, the greater the odds ratio, the greater the effect.

Tables 9, 10, and 11 contain the odds ratios, the inverse odds ratios (for odds ratios that were less than 1), and confidence limits for the dichotomous predictors (i.e., where adults stand, location of positive play, and students’ gender). For these predictors, the data was incorporated into one of two categories: the yellow sticker was in the same location as the red sticker or it was not, the green sticker was in the same location as the red sticker or it was not, and the students’ gender was either male or female. For the predictors that had more than two levels (e.g., grade and school), dummy coding was...
used when entering the data. This allowed for comparisons between each of the levels for each predictor. Tables 12 and 13 contain the contrast results (Wald chi-square and p-values), odds ratios, and inverse odds ratios for significant locations (at the .01 and .05 statistically significant levels) for grade and school. The odds ratios and the inverse odds ratios were manually calculated due to not being standard information included in the contrast estimation table produced by the computer statistics package. Therefore, confidence limits could not be calculated for the variables that required dummy coding.

**Research Question One Results**

Logistic regressions were conducted to determine if the location in which peer conflict occurs at recess was related to the location where adult supervisors stood at recess. Of the seven models that included location of adult supervisors as a predictor, the secondary equipment was the only location that demonstrated a significant relation ($p = 0.002$) between where supervisors stood and where peer conflict occurred (see Table 8).

Table 9

*Odds Ratios and Confidence Limits for the Significant Type 3 Analyses of Effects for Location Where Adult Supervisors Stand*

<table>
<thead>
<tr>
<th>Location</th>
<th>Odds Ratio</th>
<th>Inverse Odds Ratio</th>
<th>95% Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary equipment</td>
<td>2.652</td>
<td>1.445 – 4.865</td>
<td></td>
</tr>
</tbody>
</table>

As explained above, adult supervisor location, as indicated by placement of the yellow sticker, was not included in the model for the transportation structure due to quasi-separation of data. Specifically, the odds that peer conflict occurred on the secondary equipment were 2.652 times larger when adult supervisors were standing there than when they were not (see Table 9). When students put a yellow sticker on the
secondary equipment then the odds of them also placing a red sticker in the same location were significantly increased.

**Research Question Two Results**

Logistic regressions were conducted to determine if the location in which peer conflict occurred at recess was related to the location where positive play occurred at recess. Of the six models that included location of positive play, four of the locations (the large equipment, basketball court, secondary equipment, and four square court areas) demonstrated a significant relation between locations of peer conflict and positive play (p = <.001, 0.013, <.001, and .003, respectively; see Table 8). As previously mentioned, the location of positive play, as indicated by placement of the green sticker, was not included in the models for the transportation structure or soccer field due to quasi-separation of data. For the large equipment area, the odds of peer conflict occurring there were 8.772 times larger when positive play did not occur there. (The odds of putting a red sticker on the large equipment area were 8.772 times larger when students did not put a green sticker in that location than when they did.) For the basketball court, the odds of peer conflict occurring there were 12.658 times larger when positive play did not occur there. (The odds of putting a red sticker on the basketball court were 12.658 times larger when the student did not put a green sticker there.) For the secondary equipment location, the odds of peer conflict occurring there were 7.519 times larger when positive play did not occur there. (The odds of putting a red sticker on the secondary equipment location were 7.519 times larger when the student did not put a green sticker there.) Finally, for the four square court location, the odds of peer conflict occurring there were 10.309 times larger when positive play did not occur there. (The odds of putting a red sticker on the four
square court were 10.309 times larger when the student did not put a green sticker there.)

See Table 10 for details. Taken together, results suggested that the odds of peer conflict occurring in these four locations were significantly higher if positive play did not also occur there.

Table 10

*Odds Ratios and Confidence Limits for the Significant Type 3 Analyses of Effects for Location of Positive Play*

<table>
<thead>
<tr>
<th>Location</th>
<th>Odds Ratio</th>
<th>Inverse Odds Ratio</th>
<th>95% Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>0.114</td>
<td>8.772</td>
<td>0.049 - 0.268</td>
</tr>
<tr>
<td>Basketball court</td>
<td>0.079</td>
<td>12.658</td>
<td>0.011 – 0.586</td>
</tr>
<tr>
<td>Secondary equipment</td>
<td>0.133</td>
<td>7.519</td>
<td>0.055 – 0.319</td>
</tr>
<tr>
<td>Four Square Court</td>
<td>0.097</td>
<td>10.309</td>
<td>0.021 – 0.444</td>
</tr>
</tbody>
</table>

**Research Question Three Results**

Logistic regressions were conducted to determine if students’ gender was related to the locations where peer conflict occurred at recess. Three locations (the large equipment, transportation equipment, and the soccer field areas) demonstrated a significant relation between peer conflict and students’ gender (p = 0.016, <.001, and .001, respectively; see Table 8). The odds of females indicating that peer conflict occurred in a specific location were 1.724 times larger as compared to males in the large equipment location and 1.873 times larger as compared to males in the soccer field location. For the transportation structure, the odds of males indicating that peer conflict occurred in that location were 3.480 times larger than for females. See Table 11 for detailed odds ratio information for students’ gender. Overall, when there was a significant
relation between gender and location of peer conflict, the odds of males versus females indicating that peer conflict occurred there was dependent on the specific playground location.

Table 11

Odds Ratios and Confidence Limits for the Significant Type 3 Analyses of Effects for Students’ Gender (Males vs. Females)

<table>
<thead>
<tr>
<th>Location</th>
<th>Odds Ratio</th>
<th>Inverse Odds Ratio</th>
<th>95% Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>0.580</td>
<td>1.724</td>
<td>0.372 – 0.902</td>
</tr>
<tr>
<td>Transportation structure</td>
<td>3.480</td>
<td>1.900</td>
<td>6.375</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>0.534</td>
<td>1.873</td>
<td>0.375 – 0.760</td>
</tr>
</tbody>
</table>

Research Question Four Results

Logistic regressions were conducted to determine if students’ grade was related to the locations where peer conflict occurred at recess. Six of the eight playground locations (the large equipment, basketball court, open grass, the transportation structure, the soccer field, and the four square court areas) demonstrated a significant relation (p = 0.003, <.001, 0.001, and <.001, respectively; see Table 8) between peer conflict and students’ grade.

Results from four of the locations suggested that students in younger grades were more likely to report that conflict occurred in that location when compared to older students’ reports. For the large equipment area, the odds of a second grader indicating that peer conflict occurred in that area were 3.778 times larger when compared to fifth grade students. Similarly, the odds of a third grader indicating that peer conflict occurred
Table 12

*Grade Contrast Test Results for Significant Locations*

<table>
<thead>
<tr>
<th>Location by Contrast</th>
<th>Wald Chi-Square</th>
<th>P-Value</th>
<th>Odds Ratio</th>
<th>Inverse Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 5th</td>
<td>12.124</td>
<td>.001*</td>
<td>3.778</td>
<td></td>
</tr>
<tr>
<td>3rd vs. 5th</td>
<td>9.531</td>
<td>.002*</td>
<td>3.348</td>
<td></td>
</tr>
<tr>
<td>4th vs. 5th</td>
<td>11.937</td>
<td>.001*</td>
<td>3.814</td>
<td></td>
</tr>
<tr>
<td><strong>Basketball court</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 5th</td>
<td>23.758</td>
<td>&lt;.001*</td>
<td>6.631</td>
<td></td>
</tr>
<tr>
<td>3rd vs. 5th</td>
<td>4.857</td>
<td>0.028**</td>
<td>2.529</td>
<td></td>
</tr>
<tr>
<td>4th vs. 5th</td>
<td>10.262</td>
<td>0.001*</td>
<td>3.624</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 3rd</td>
<td>10.534</td>
<td>0.001*</td>
<td>2.622</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 4th</td>
<td>5.010</td>
<td>0.025**</td>
<td>1.830</td>
<td></td>
</tr>
<tr>
<td><strong>Open grass</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 3rd</td>
<td>6.807</td>
<td>0.009*</td>
<td>2.876</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 4th</td>
<td>12.099</td>
<td>0.001*</td>
<td>5.807</td>
<td></td>
</tr>
<tr>
<td><strong>Transportation structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 5th</td>
<td>14.095</td>
<td>&lt;0.001*</td>
<td>46.187</td>
<td></td>
</tr>
<tr>
<td>3rd vs. 5th</td>
<td>7.834</td>
<td>0.005*</td>
<td>18.211</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 3rd</td>
<td>8.628</td>
<td>0.003*</td>
<td>2.536</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 4th</td>
<td>19.416</td>
<td>&lt;0.001*</td>
<td>7.488</td>
<td></td>
</tr>
<tr>
<td>3rd vs. 4th</td>
<td>4.850</td>
<td>0.028**</td>
<td>2.952</td>
<td></td>
</tr>
<tr>
<td><strong>Soccer Field</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 5th</td>
<td>16.490</td>
<td>&lt;.001*</td>
<td>0.349</td>
<td>2.865</td>
</tr>
<tr>
<td>2nd vs. 3rd</td>
<td>16.412</td>
<td>&lt;.001*</td>
<td>2.738</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 4th</td>
<td>7.610</td>
<td>0.006*</td>
<td>0.488</td>
<td>2.049</td>
</tr>
<tr>
<td><strong>Four Square Court</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd vs. 5th</td>
<td>69.697</td>
<td>&lt;.001*</td>
<td>0.056</td>
<td>17.857</td>
</tr>
<tr>
<td>3rd vs. 5th</td>
<td>79.441</td>
<td>&lt;.001*</td>
<td>0.024</td>
<td>41.667</td>
</tr>
<tr>
<td>4th vs. 5th</td>
<td>15.369</td>
<td>&lt;.001*</td>
<td>0.304</td>
<td>3.289</td>
</tr>
<tr>
<td>2nd vs. 3rd</td>
<td>4.059</td>
<td>0.044**</td>
<td>2.327</td>
<td></td>
</tr>
<tr>
<td>2nd vs. 4th</td>
<td>28.223</td>
<td>&lt;.001*</td>
<td>0.184</td>
<td>5.435</td>
</tr>
<tr>
<td>3rd vs. 4th</td>
<td>41.039</td>
<td>&lt;.001*</td>
<td>0.079</td>
<td>12.658</td>
</tr>
</tbody>
</table>

* Significant at p < .01
** Significant at p < .05
there were 3.348 times larger when compared to fifth graders. The odds of fourth graders indicating that peer conflict occurred there were 3.814 times larger when compared to fifth graders (see Table 12). A similar pattern was found for the basketball court in that the odds of students in the lower grades indicating that peer conflict occurred there were higher when compared to the fifth graders’ reports. Specifically, the odds of second, third, and fourth graders indicating that peer conflict occurred on the basketball court were 6.631, 2.529, and 3.624, respectively, times larger when compared to fifth grade students’ reports. Further, the odds of second grade students indicating that peer conflict occurred on the basketball court were 2.622 and 1.830 times larger when compared to third and fourth grade students’ reports, respectively (see Table 12). In regards to the open grass area, the odds of a second grader indicating that peer conflict occurred in that location were 2.876 and 5.807 times larger as compared to third and fourth graders’ reports, respectively (see Table 12). For the transportation structure area, all but one of the possible grade comparisons indicated significant differences between students’ report of peer conflict. All of the significant relations suggested that students in lower grades indicated that peer conflict was more likely to occur at the transportation structure than students in the compared upper grade. Specifically, the odds of second grade students indicating that peer conflict occurred at the transportation structure were 2.536, 7.488, and 46.187 times larger as compared to third, fourth, and fifth grade students, respectively (see Table 12). Also, the odds of third grade students indicating that peer conflict occurred at the transportation structure were 2.952 and 18.211 times larger as compared to fourth and fifth grade students, respectively (see Table 12).
In two locations, students in higher grades were often more likely to indicate that peer conflict occurred there as compared to the reports of students in lower grades. On the soccer field, this pattern was confirmed as indicated by the findings that the odds of fourth and fifth graders indicating that peer conflict occurred there were 2.049 and 2.865, respectively, times larger when compared to second grade students (see Table 12). However, when second and third graders’ reports were compared, it was found that the odds of second grade students indicating that peer conflict occurred at the soccer field were 2.738 times larger as compared to third graders. Finally, on the four square court, the odds of fifth graders indicating that peer conflict occurred there were 17.857, 41.667, and 3.289 times larger than second, third, and fourth grade students, respectively (see Table 12). This trend continued with fourth graders’ reports as compared to students in the younger grades. Specifically, the odds of fourth grade students indicating that peer conflict occurred there were 5.435 and 12.658 times larger than second and third grade students’ reports, respectively. Similar to the comparison between second and third grade students’ reports on the soccer field, it was found that the odds of second graders indicating that peer conflict occurred on the four square court were 2.327 times larger than third graders.

Overall, these results suggest that there were significant grade differences in where students experienced peer conflict. However, the direction of the grade differences was dependent on the specific playground locations.

**Research Question Five Results**

Logistic regressions were conducted to determine if the students’ school was related to the locations where peer conflict occurred at recess. For seven of the eight
playground locations (the basketball court, open grass, climbing structure, transportation structure, secondary equipment, soccer field, and four square court locations), a significant relation ($p = <.001$, $<.001$, $0.004$, $<.001$, $<.001$, and $<.001$, respectively) between peer conflict and the students’ school was demonstrated (see Table 8).

Table 13

School Contrast Test Results for Significant Locations

<table>
<thead>
<tr>
<th>Location by Contrast</th>
<th>Wald Chi-Square</th>
<th>P-Value</th>
<th>Odds Ratio</th>
<th>Inverse Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball court</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>45.230</td>
<td>&lt;.001*</td>
<td>0.159</td>
<td>6.289</td>
</tr>
<tr>
<td>School B vs. School C</td>
<td>7.002</td>
<td>0.008*</td>
<td>0.362</td>
<td>2.762</td>
</tr>
<tr>
<td>Open grass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School B</td>
<td>25.099</td>
<td>&lt;.001*</td>
<td>0.105</td>
<td>9.562</td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>10.200</td>
<td>0.001*</td>
<td>0.241</td>
<td>4.149</td>
</tr>
<tr>
<td>School B vs. School C</td>
<td>6.998</td>
<td>0.008*</td>
<td>2.300</td>
<td></td>
</tr>
<tr>
<td>Climbing structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School B</td>
<td>4.349</td>
<td>0.037**</td>
<td>3.305</td>
<td></td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>8.989</td>
<td>0.003*</td>
<td>4.577</td>
<td></td>
</tr>
<tr>
<td>Transportation structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School B</td>
<td>3.885</td>
<td>0.049**</td>
<td>0.528</td>
<td>1.859</td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>11.023</td>
<td>0.001*</td>
<td>4.605</td>
<td></td>
</tr>
<tr>
<td>School B vs. School C</td>
<td>19.203</td>
<td>&lt;.001*</td>
<td>8.557</td>
<td></td>
</tr>
<tr>
<td>Secondary equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School B</td>
<td>18.521</td>
<td>&lt;.001*</td>
<td>5.687</td>
<td></td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>27.629</td>
<td>&lt;.001*</td>
<td>5.808</td>
<td></td>
</tr>
<tr>
<td>Soccer Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School B</td>
<td>17.686</td>
<td>&lt;.001*</td>
<td>0.447</td>
<td>2.237</td>
</tr>
<tr>
<td>Four Square Court</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School A vs. School C</td>
<td>127.796</td>
<td>&lt;.001*</td>
<td>0.021</td>
<td>47.619</td>
</tr>
</tbody>
</table>

* Significant at $p < .01$

** Significant at $p < .05$
For the basketball court, the odds of students from School A and School B indicating that peer conflict did not occur there were 6.289 and 2.762, respectively, times larger when compared to students from School C (see Table 13). For the open grass area, the odds of students from School A indicating that peer conflict did not occur there were 9.562 and 4.149 times larger when compared to students from School B and C, respectively (see Table 13). However, the odds of students from School B indicating that peer conflict occurred in the open grass area were 2.300 times larger than students from School C. For the climbing structure, the odds of students in School A indicating that peer conflict occurred there were 3.305 and 4.577 times larger when compared to students in School B and C, respectively (see Table 13). In regards to the transportation structure, the odds of students from Schools A and B indicating that peer conflict occurred in that area were 4.605 and 8.557 times larger when compared to student reports from School C, respectively (see Table 13). However, the odds of students from School A indicating that peer conflict did not occur at the transportation structure were 1.859 times larger than students from School B. For the fifth area, the secondary equipment area, the odds of students in School A indicating that peer conflict occurred there were 5.687 and 5.808 times larger than students in School B and C, respectively (see Table 13).

In the case of the soccer field and four square court locations, school differences could only be calculated amongst two schools due to the fact that the third school did not have that specific area on their playground. For the soccer field, the odds of students in School B indicating that peer conflict occurred there were 2.237 times larger than
students in School A. Similarly, for the four square court, the odds of students in School C indicating that peer conflict occurred there were 47.619 times larger than students in School A, suggesting that students in School C are far more likely to experience conflict on the four square court than students in School A.

Taken together, these results suggest that there were often differences between schools in where students experienced peer conflict. However, the between school differences depended on the playground location.
CHAPTER 5: DISCUSSION

Recess plays an important role in students’ school days because it provides students opportunities to interact with their peers in a more unstructured, non-academic environment. Some research has explored the relation among peer conflict within school contexts and how it is related to locations of positive play and the presence of adult supervisors. Further, researchers have conducted studies to examine within-group differences for gender and grade, as well as between school differences. However, results in the extant literature have been mixed. The essential question of this dissertation was which variables predict where peer conflict occurs during recess.

Research Question One: Is the Location of Playground Peer Conflict Related to the Location Where Adult Supervisors Stand?

This study found a significant relation between where supervisors stood and where peer conflict occurred for only one of the common playground locations (secondary equipment). The results suggested that the odds that peer conflict occurred on the secondary equipment were significantly larger when adult supervisors were standing there than when they were not. This result was contrary to the hypothesis that peer conflict would be less likely to occur in a location if an adult supervisor was also in the same location.

These results are surprising for several reasons. First, only one of the seven models that included location of adult supervisors as a predictor demonstrated a significant relation. This suggests that the presence of adults may not play an important role in deterring peer conflict in most specific locations. This is surprising because previous research suggests that students often behave differently when adults are present
(Schwebel & Bounds, 2003). Second, given that the peer conflict was more likely to occur when adult supervisors were near the secondary equipment area than when they were not there suggests that the adult presence co-occurred with increased peer conflict. Although this relation was only noted for one location, it is contrary to previous research that suggests that adult supervision decreases peer conflict (Doll & Brehm, 2010; Franzen & Kamps, 2008; Lewis et al., 2000; Schwebel et al., 2006; Siemers, 2006).

Researchers have suggested that students engage in peer conflict in places where adult supervisors cannot see or hear the conflict (Doll & Brehm, 2010; Olweus, 1993; Pellegrini, 2005). Doll and Brehm (2010) described anecdotal reports that adults stand in predictable locations on the playground, which makes it easier for students to recognize which areas are minimally supervised. One possibility is that the secondary equipment area allowed students to engage in peer conflict while hiding from adult supervisors in tunnels and slides or on equipment that is tall and difficult to supervise from the ground. Though adult supervisors were located in this playground location, it could have been outside of the watchful eyes of adult supervisors given the structures of playground equipment where students can hide.

Alternatively, it is possible that supervisors were standing there because so much conflict occurred on the secondary equipment. This could be tested by asking adult supervisors to also indicate where they often stand on the playground and then by comparing students’ and teachers’ reports of the same data. It might also be helpful to ask adult supervisors why they stand in those locations. If results were to indicate that adult supervisors are indeed standing in specific locations because that is where they observe the most peer conflict, these results may suggest that adult supervisors’ presence in a
location does not cause peer conflict to occur there. Instead, active supervision that involves frequent interactions between adult supervisors and students playing on the playground may be necessary to thwart peer conflict from occurring over and above simply placing an adult on the playground. Therefore, it might mean that more frequent and active supervision ought to occur on playgrounds at recess. Future research should attempt to test these possibilities to determine if there is indeed any relation, positive or negative, between where peer conflict occurs and adult supervision.

**Research Question Two: Is the Location of Playground Peer Conflict Related to the Location Where Positive Play Occurs?**

The second research question explored the relation between peer conflict and positive play. Results showed that a significant relation did exist between locations where peer conflict and positive play occurred for four of the six possible playground locations (the large equipment, basketball court, secondary equipment, and four square areas). However, contrary to the hypothesis, the results suggested that the odds of peer conflict occurring in a certain location increased when positive play did not occur there. This is contrary to the hypothesis that stated that the odds that peer conflict occurred in a location would be higher if positive play also occurred in that location.

This finding contradicts previous research that found that students experience peer conflict and positive play in some of the same school locations (Zumbrunn et al., 2013). Similarly, Dooley et al. (2011) found that the most frequently selected places for “where kids get along” and “where kids do not get along” on the playground were the same. A major difference between this dissertation and Dooley et al.’s study was that Dooley’s participants were from one school, while this study used data across three different
schools. It could be that the results from Dooley et al.’s study were a product of that one particular school given that the results did not replicate across the playgrounds included in the current study. One explanation for the current study’s results could be that if students engaged in peer conflict on the basketball court, for example, other students moved to a different location so that they could play positively with their peers.

Similarly, it is possible that certain groups of students who engage in more peer conflict establish dominance and control the resources in certain playground locations making it more likely for other students to find different playground locations to play.

Based on this finding, if positive play occurred in a location then the likelihood that peer conflict also occurred there was significantly reduced and, therefore, may not be an area that would be in need of significant intervention. The occurrence of positive play may deter peer conflict from occurring in locations without additional peer or adult intervention required. Previous research suggested that peer conflict and positive play occur in the same locations, but did not specifically look at the probability of negative peer interactions occurring if positive peer interactions also occurred there. Future research could attempt to determine if positive and negative interactions occur in some locations based on happenstance or if the occurrence of one interaction significantly increases the probability that the opposite peer interaction will also occur in that location as was found in four of the locations in this study.

**Research Question Three: Do Male and Female Students Identify Different Locations Where Peer Conflict Occurs?**

This question examined the relation between peer conflict and students’ reported gender. Results showed a significant relation between location of peer conflict and
gender for three of the eight locations (the large equipment, transportation structure, and soccer field areas). Specifically, in the transportation structure area, the odds of males indicating that peer conflict occurred there were significantly larger than females, but for the large equipment and soccer field areas the relation was opposite in that the odds of females indicating that peer conflict occurred there was significantly higher than males. The hypothesis that the location of peer conflict would not be related to students’ gender was confirmed for the five playground locations that demonstrated no significant relation between location of peer conflict and positive play.

In regards to the relation between peer conflict and gender differences, the results from this study were mixed, which is similar to previous research in this area. Some prior research suggests that males and females experience peer conflict differently (Crick, Bigbee, & Howes, 1996; Salmivalli, Lappalainen, & Lagerspetz, 1998; Skues, Cunningham, & Pokharel, 2005), while other studies have found no differences (Dooley et al., 2011; Hanish, Kochenderfer-Ladd, Fabes, Martin, & Denning, 2004). Similarly, mixed results have been found when examining gender differences of locations in which peer conflict is likely to occur. Astor (1998) found that male and female students perceived peer conflict differently in various school locations, while Zumbrunn et al. (2013) and Astor et al. (2001) reported no gender differences in student reports of locations where peer conflict occurred at school.

In this study, a significant relation between peer conflict and gender was demonstrated in three of the playground locations and no significant relation was demonstrated in the other five playground locations. This raises the possibility that male and female students’ experience of peer conflict may depend upon the physical
playground location. It is possible that gender differences in peer conflict may be linked to social conventions on the playgrounds. This may suggest that male and female students engage in different types of play even though the play is occurring in the same locations. Pellegrini et al. (2004) found that there were indeed differences in the type of games that males and females played at recess. Specifically, boys played more games than girls, boys played more ball and chase games than girls, and girls played more games that had verbal components than boys. Taken together with the results from the current study, one possibility is that male and female students were engaging in different types of play in the locations that demonstrated a significant relation and, as a result, their experiences of peer conflict in these locations differed. Future research could test this theory by coupling the playground map data with interviews that ask students to describe the types of games and play that occur in the different common locations. This would allow for qualitative analysis of the interviews to determine if there are indeed differences in the type of play that occurs there.

**Research Question Four: Is the Location of Playground Peer Conflict Related to Students’ Grade Level?**

The fourth research question examined the relation between peer conflict and students’ grade level. This study found a significant relation between peer conflict and grade level for six out of the eight playground locations. This finding was contrary to the hypothesis that peer conflict that occurred in a location would be the same for each grade level. Instead, this study found a consistent pattern in which students in the lower grades indicated that peer conflict was more likely to occur in four locations than the higher-grade students’. Perhaps due to their younger age, second grade students may have more
difficulty navigating peer conflict than their older peers. These results are similar to prior studies that suggested that students perceive locations of peer conflict differently as they get older (Astor et al., 1999; Astor et al., 2001; Dooley et al., 2011; Zumbrunn et al., 2013) because their play and behavioral expectations in specific locations change for each grade level (Darling et al., 2005; Garton, 1991). Results to date suggest that students experience peer conflict differently in different locations based on their grade level. One way to test this would be to ask students to indicate on the map which games are typically played in the common locations. This would allow for a better understanding of whether the types of games played at recess differ across the grades. Alternatively, students could be verbally interviewed or given written prompts in order to capture their perspective as to why peer conflict occurs in the location that they indicated on the map. This would allow for a more thorough understanding of not just whether peer conflict occurred there, but also why it occurred in that location. This information would assist researchers in understanding why peer conflict is occurring in some locations for certain grades and not others. Also, the information could help adult supervisors understand where and why peer conflict is occurring, which could then be used to determine the best supervision practices for their school. It could be the case that, for example, second graders indicate that the odds of peer conflict occurring on the transportation structure are higher than fifth graders’ reports. This information could have profound implications on supervision practices, such as having the adult supervisors monitoring the transportation structure more closely for second graders than would be needed for the fifth grade students.
For the soccer field and four square court locations, the higher grades reported that conflict was more likely to occur there. One possibility is that this is due to students’ growing maturity in game play with age. It could be possible that as students get older their play becomes more competitive. When students engage in game play that has a prescribed set of rules, it could be possible that peer conflict is perceived to occur when students do not agree on rules, do not follow the set rules, or are not able to accept defeat when they do not win a game.

Although students in different grades may spend different amounts of time in the same playground location, this was statistically controlled for by including the location where students spend most of their time (indicated by the blue sticker) as a predictor. Therefore, it is not likely, for example, that second grade students spend more time on the basketball court than fifth graders and so this is not a likely explanation of why the odds of peer conflict occurring there were higher for second graders than fifth graders.

**Research Question Five: Are There Differences Between Schools That Affect Where Peer Conflict Occurs?**

The last research question examined school differences in the locations where peer conflict occurred on the playgrounds. The results from this study found that there were school differences in a majority of the common playground locations (i.e., seven of the eight playground locations). This confirmed the hypothesis that the location of peer conflict would be related to which school the student was enrolled in. Interestingly, no consistent pattern was found in which school had higher odds ratios. This likely suggests that even though there were major differences across the demographic makeup of the
schools (e.g., total school enrollment, ethnic diversity, school location), there was not one school that was consistently found to be more different than the other two schools.

Though the locations across the three playgrounds were held constant, the size of the playgrounds and the number of students and adult supervisors at recess at one time differed across the three schools and could not be held constant (see Table 4). Zumbrunn et al. (2013) found that student perceptions of their school environment influenced their ratings of where peer conflict and positive play occurred at school. Dooley et al. (2011) found differences across three schools in students’ reports of peer relationships and peer conflict. Specific to the playground at recess, Siemers (2006) suggested that games played at recess (both competitive and non-competitive) may vary between schools and, therefore, may affect where conflict occurs on each playground. Therefore, it is not surprising that previous results combined with the results of this study suggest that school contexts, specifically on the playground, are related to the nature of students’ interactions. This is an important issue for further study because the peer interactions that occur (positive play or peer conflict) in a common location on one playground may not occur in the same location on another playground due to differences in playground structures and activities available, as well as differences in recess rules and student expectations. It would be advantageous for adult supervisors to understand the peer interactions that occur on their specific school’s playground because the profile of peer interactions may be unique to their school’s playground and their students. More strategies are needed to help adult supervisors understand the unique dynamics on their own playground. Additional research should be conducted in order to look at peer interactions within and across playgrounds.
Limitations

There were several limitations to this study. First, the playgrounds were not equivalent in size or equipment. While all of the playgrounds were well furnished and had numerous playground structures (e.g., slides, climbing equipment, etc.), the sizes and amount of available structures varied. As noted in Table 4, the amount of space that the playgrounds occupied also varied. While the larger playground corresponded to the school with the largest student populations, thus making the space appropriate for the number of students occupying the space at one time, the playground size and available equipment were not held constant for this study. It is also important to note that the schools included in this study were all Midwestern schools. It may be the case that these schools have more space available to designate as a playground area than would be possible for more urban schools. If the same study were to be conducted in urban schools, the results may differ due to limited amount of space available for playgrounds. It might also be the case that overcrowded schools may not only have smaller playgrounds, but may also have more students on the playground at one time. In this study, the number of students on the playground during their recess time differed. Some differences detected between schools may be due to the differing number of students on the playground at one time. More students vying for playground equipment and space to play at recess may increase the amount of peer conflict that occurs.

School personnel approved the playground maps before data collection began. However, on School A’s playground a new piece of equipment was added between the time that the map was made and when data collection occurred. Data collectors had to accommodate this addition to the playground by orienting the students to the location
where the new playground equipment was placed. This required a modification in the
directions that were given to students. It could be the case that by specifically pointing
out one piece of playground equipment that students were then primed to place their
stickers on that location since the other locations were not specifically discussed by the
data collectors.

Students in Schools B and C indicated that more peer conflict occurred on the
large equipment area than occurred on the secondary playground equipment. However,
for School A, almost twice as many red stickers were placed on the secondary equipment
(the new equipment) than the large equipment area. It is possible that the difference
between schools may be due to the novelty of the new equipment for School A. If the
same information was collected from students several months after the addition of the
new equipment, the novelty may have worn off and, thus, the results may have differed.
See Figures 1 and 4 for a comparison of the playground map distributed to students and
the playground map that was used for coding purposes, which incorporated the new
equipment location.

To compare results across schools, this study analyzed data from locations that
were common to at least two of the schools studied. There were six common locations
across all three playgrounds used in this study and there were two additional locations
that were common to two schools in the study. However, the original maps were divided
into several locations (ranging from 9 to 12 locations) based on naturally occurring
divisions between each playground area. Since each playground’s naturally occurring
divisions were different, it resulted in playground locations of various sizes within and
between playgrounds. For instance, for School B, the size of the soccer field area was
significantly larger than any other area on the school’s map and compared to the soccer field area on School A’s map. Even with these size differences, the maps were drawn as true to scale as possible.

Additionally, the methodology that was used in the study accurately captured students’ perspectives of where peer conflict and positive play occurred, but did not capture students’ perspectives of why they believe that the specific peer interactions occurred in the different playground locations. Potential possibilities for the results of this study, based on previous research findings, were raised earlier in this chapter. However, conclusions could not be definitely stated for why peer conflict did or did not occur in the different common locations.

**Directions for Future Research**

Understanding how different student variables are related to the peer conflict that occurs on the playground is essential in being able to enhance students’ perceptions of peer interactions during recess. Given that only three Midwestern schools were used in this study, the results need to be replicated. Future research should attempt to replicate these procedures across schools with different student populations and playground structures to see if the same results are found for the same locations on different playgrounds.

The simple, straightforward data collection procedures that were used in this study could easily be used by school staff to understand where positive and negative peer interactions are occurring on their specific playground. This could allow for focused interventions to increase positive play and decrease peer conflict. Further, this methodology allows for repeat measurement to determine if the interventions are
successful. Future research could also explore whether interventions concentrating on teaching adult supervisors active supervision methods would impact students’ perceptions of where peer conflict and positive play occur. Additionally, this study’s methodology could be used to assess students’ perspectives pre- and post- interventions that are aimed to change the activities that students engage in on the playground. Intervention studies would be useful in determining if specific manipulation of adult supervisors’ interactions with students or changes in playground characteristics would impact how students view interactions that occur on the playground.

The process of collecting students’ perceptions of where peer conflict and positive play occur at recess could be refined further by gathering qualitative information to better understand students’ perspectives as to why these interactions occur in the specific playground locations. Further, asking students to describe the types of games and play that occur in the different common locations would allow for analysis of gender and grade differences in play across the locations. Including a qualitative component to the current study’s methodology would help address some of the questions that were raised by the current results. For example, using a mixed-methods approach would allow for a more thorough understanding of students’ peer interactions at recess.

Additional research should be conducted in order to understand the type of games and play that occur in the various common locations. Gathering students’ perspectives on the play that occurs in these locations would help understand which types of activities promote positive and negative peer interactions. Determining which activities are perceived to be fun and engaging would help school personnel promote activities that students enjoy and would allow for adults to help foster positive play within those
activities. Further, understanding the types of games that occur in the different locations would allow for a better understanding of how this play is affected by both peer conflict and positive play.

**Implications for Practice**

The results of this study have several implications for practice. First, school personnel may find that using this study’s methodology in their own school could help them understand the student interactions that occur at recess from the students’ perspectives. This would allow for implementation of interventions specific to their student population and playground configuration. Whether the intervention components need to be at the student, supervisor, or structural level would be able to be determined for each specific school. As mentioned earlier, playground interventions could be assessed by collecting the playground maps before and after intervention implementation to determine if changes occurred in where students indicated peer conflict and positive play occurred at recess. It also may be the case that adult supervisors may not be aware that many students view a specific playground location as a peer conflict prone area. A more thorough understanding of how students within one recess period view the peer interactions that occur across the playground would be helpful for adult supervisors to have a better understanding of what might actually be occurring based on the students’ perspectives.

Further, the results obtained from this study and future studies using the same methodology can help refine our understanding of effective playground practices. The impact of active supervision practices on student interactions across playground locations could be assessed. Moreover, rules and expectations for student behavior at recess could
be assessed to determine what the most clear, useful rules are for promoting positive student interactions across playground activities.

Finally, evidence from this study suggests that the odds of peer conflict occurring in certain playground locations are affected by student specific characteristics (i.e., grade and gender). Playground activities that are developmentally appropriate for each age level would likely be useful in promoting positive play at recess. Further, activities that are closely linked to gender specific social conventions and play may be linked to the peer interactions that occur at recess. Inspection of student expectations based on gender and grade may be useful across schools when trying to understand differences in peer interactions.
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Figure 1. School A Playground Map

Gender: Male Female Grade: 2 3 4 5
Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
Figure 2. School B Playground Map

Gender: Male Female Grade: 2 3 4 5

Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
Figure 3. School C Playground Map

Gender: Male Female Grade: 2 3 4 5

Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
Figure 4. School A Divided Playground Map With Common Locations Labeled

Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
Figure 5. School B Divided Playground Map With Common Locations Labeled

Gender: Male  Female  Grade: 2 3 4 5

Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
Figure 6. School C Divided Playground Map With Common Locations Labeled

Gender: Male Female Grade: 2 3 4 5

Directions: Please think about the last 2 weeks and place the GREEN sticker where kids DO get along at recess. Place the RED sticker where kids DO NOT get along at recess. Place the YELLOW sticker where ADULTS STAND at recess. Place the BLUE sticker where kids spend MOST OF THEIR TIME at recess.
APPENDIX A: ClassMaps Research Parent Notice: English Version

ClassMaps Research Information (Parent)

Dear Parent:

Your child is invited to participate in the following ClassMaps School and Playground Study to improve the class’s environment for learning. You can ask that your child not participate. Read the following description, and then decide whether you want to make that request. At the end, you will find information about how to ask that your child not participate.

Project: ClassMaps School and Playground Study

Purpose of the project: Your child’s teacher will participate in this study, and will be using ClassMaps to improve the class’s environment for learning. The class’s students will help by completing anonymous surveys or marking playground maps, and making suggestions for class change. Your child will spend no more than 90 minutes, total, in activities related to this project.

Procedures: All ClassMaps activities will occur in your child’s classroom. First, the class’s students will complete anonymous surveys or mark playground maps asking about learning supports in the class. The survey asks questions about students’ confidence in schoolwork, interactions with classmates and the teacher, ability to take charge of their learning, rules following in their class, worries about other kids, and talks with parents about their learning. The map asks students to mark the places where students do and do not get along, and the places where teachers stand on the playground. The classroom teacher will give non-participating students alternative work to do during this time. Next, a university researcher will compile the student surveys and will give the teacher simple graphs that show the survey results. Most teachers will hold a classroom meeting to show the graphs to students, and ask for their ideas about how to improve the class. The teacher might also show this graph to parents, or to others who work with the class. Teachers will give the researcher information about the class including the grade, number of students, their ethnicity, and the percent of students working below grade level in reading and math. Some teachers may also give records of classwide behavior and activities to the researcher. Examples of classwide records include the percent of students who turn in homework, the number of discipline referrals made, class performance on weekly quizzes, or attendance rates. These records will always describe the whole class and will never describe any individual student.

Some teachers may also work with the researcher to improve their class. In this case, the teacher will make a plan for improving the class. Sometimes, other teachers or parents will help with the plan. More anonymous student surveys will be collected to see if the plan works. The teacher will also keep simple records to see if the plan works. Notes will be kept of the teacher’s plans and meetings.

Risks and/or discomforts: Risks to your student are less than minimal. Student surveys and playground maps will not have student names on them, and will be shredded once the information has been recorded and coded into graphs.

Benefits: Classes will benefit from ClassMaps because teachers will learn what to do to improve the class’s learning supports. Schools will benefit from the procedure for strengthening
class environments for learning.

Confidentiality: ClassMaps’ student surveys, playground maps, and graphs will not identify students, classes or teachers. Instead, all class records will be identified only by a number or nonsense name. Students will not write their names on the anonymous student surveys or maps. Once information from the student surveys or maps have been recorded in a data file, these will be shredded. Records from this study will be stored for 5 years in a locked cabinet in the university researcher’s office and will only be seen by the researcher or graduate assistants. The information obtained in this research may be published in professional journals or presented at scientific meetings, but the data will be reported as group data and will not identify any class or school by name.

Compensation. Your child’s teacher and your child will not receive any money for participating in this project.

Opportunity to ask questions. You can ask questions about ClassMaps and get answers to your questions now or anytime during the study. Or, you may call Beth Doll to discuss the research, telephone 402 472 2238 or email bdoll2@unl.edu. If you have concerns about the study or if Dr. Doll cannot answer questions about your rights as a research participant, you can contact the University of Nebraska Lincoln Institutional Review Board, telephone 402 472 6965.

Freedom to withdraw. Your child’s participation in this study is voluntary. You or your child are free to decide not to participate or to withdraw at any time. If you withdraw your child from the study, it will not harm your relationship to Dr. Doll, the University of Nebraska-Lincoln or your school. If you withdraw, you will not lose any benefits that you are otherwise entitled to receive.

Consent. To ask that your child not participate in this study, simply call or send a note to the school, your teacher, or Dr. Beth Doll by the following date: ___________. If you do not ask to have your child left out of the study, your child will participate in the classroom meeting and the anonymous surveys and map in a group with other students in the class. If you ask that your child be left out of the study, your child will not complete the surveys or map, but will still be part of any classroom discussions.

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APPENDIX B: ClassMaps Research Parent Notice: Spanish Version

Información de Investigación sobre Mapas de Clase y Recreo (Padre de Familia)

Querido Padre de Familia:

Su hijo/a está invitado a participar en el siguiente estudio de consultoría sobre Mapas de Clase y Recreo para mejorar el ambiente de aprendizaje en el salón de clase. Usted puede elegir que su hijo/a no participe. Lea la siguiente descripción y luego decida si le permitirá a su hijo/a participar o no. Al final, encontrará detalles sobre cómo informar que su hijo/a no participará del estudio.

Proyecto: Proyecto de Consultoría sobre Mapas de Clase y Recreo

Objetivo del proyecto: El maestro o la maestra de su hijo/a participará en este estudio y usará Mapas de Clase para mejorar el ambiente de aprendizaje dentro del salón de clase. Los estudiantes que participen completarán una encuesta de forma anónima o etiquetarán el mapa del patio de recreo y darán sugerencias sobre cómo modificar el salón de clase. Su hijo/a no dedicará más de 90 minutos en las actividades relacionadas con este proyecto.

Procedimientos: Todas las actividades sobre Mapas de Clase ocurrirán dentro del salón de clase. Primero, los estudiantes del salón llenarán encuestas anónimamente sobre los apoyos de aprendizaje dentro del salón de clase o etiquetarán el mapa del patio del recreo indicando donde se encuentran estos apoyos. La encuesta hace preguntas acerca de la confianza de los estudiantes en las tareas escolares, las interacciones con sus compañeros de clase y el maestro(a), la capacidad de hacerse cargo de su aprendizaje, seguir las reglas dentro del salón, preocupaciones por los demás estudiante, y conversaciones con padres sobre su aprendizaje. El mapa pide a los estudiantes que etiqueten los lugares donde los estudiantes se llene bien o no, y los lugares donde los maestros están en el patio de recreo. El maestro(a) dará a los estudiantes que no participen otro trabajo que hacer durante este tiempo. Próximo, un investigador de la universidad recogerá todas las encuestas y le dará al maestro o maestra gráficas simples sobre los resultados de las encuestas. La mayoría de los maestros/maestras tendrán una reunión en el salón con los estudiantes para mostrar las gráficas y preguntarles sobre ideas de cómo mejorar el salón de clase. El maestro/maestra podría también mostrar estas gráficas a los padres de familia u otras personas que colaboran con el salón de clase. Los maestros le darán información al investigador sobre la clase, incluyendo el grado, número de estudiantes, su origen étnico, y el porcentaje de estudiantes que trabajan por debajo del nivel esperado en lectura y matemáticas. Algunos maestros/maestras también podrán dar registros al investigador sobre la conducta y las actividades de toda la clase. Ejemplos de registros sobre toda la clase incluyen el porcentaje de estudiantes que entregar tareas, número de problemas de disciplina registrados, desempeño de la clase en exámenes semanales o registros de asistencia. Estos registros siempre describirán al salón como grupo y nunca describirá a un estudiante en particular.

Algunos maestros/maestras también podrán colaborar con el investigador para mejorar sus salones de clases. En dado caso, el maestro/maestra hará un plan para mejorar el salon de clase. En ocasiones, otros maestros/maestras o padres ayudarán con el plan. Encuestas anónimas adicionales se harán y recogerán entre los estudiantes para
identificar si el plan de mejora funcionó. El maestro/maestra también mantendrá registros simples para observar si el plan está funcionando. Se mantendrán notas sobre los planes de los maestros y las reuniones.

Riesgos y/o incomodidades: Riesgos a su estudiante son mínimos. Las encuestas de los estudiantes son anónimas y serán destruidas una vez que la información esté registrada y codificada en las gráficas.

Beneficios: Salones de clase se beneficiarán de Mapas de Clase porque los maestros/maestras aprenderán que hacer para mejorar los apoyos de aprendizaje dentro de su salón de clase. Las escuelas se beneficiarán del desarrollo de un nuevo procedimiento para mejorar los ambientes de aprendizaje.

Confidencialidad: Las encuestas y las gráficas generadas por los Mapas de Clase y Recreo no identificarán estudiantes, salones de clase, o maestros/maestras. De hecho, todos los registros sobre el salón de clase serán identificados solamente por un número o un sobrenombre. Los estudiantes no escribirán sus nombres en las encuestas. Una vez la información de las encuestas hayan sido registradas en un archivo de datos, las encuestas serán destruidas. Registros de este estudio serán guardados bajo llave en la oficina del investigador en la universidad por 5 años y solamente serán vistos por el investigador y sus asistentes. La información obtenida en esta investigación podrá ser publicada en revistas científicas o presentada en conferencias científicas. No obstante, los datos a reportarse serán sobre el grupo y no identificarán ninguna clase o escuela por su nombre.

Compensación. Ni el maestro/a ni su hijo/a recibirá dinero por participar en este estudio.

Oportunidad de hacer preguntas. Usted puede hacer preguntas sobre Mapas de Clase y estas serán contestadas hoy o en cualquier momento durante el estudio. Usted también puede hablar con la Dra. Beth Doll sobre esta investigación comunicándose al (402) 472-2238 o por email bdoll2@unl.edu. Si tiene dudas sobre el estudio o si la Dra. Doll no puede responder a preguntas sobre sus derechos como participante, puede contactar la Junta Institucional de Revisiones de la Universidad de Nebraska Lincoln al 402 472 6965.

Libertad de retirarse. La participación de su hijo/a es voluntaria. Usted o su hijo/a están libres de decidir no participar o retirarse de la investigación en cualquier momento. De retirar a su hijo/a del estudio, su relación con la Dra. Doll, la Universidad de Nebraska-Lincoln o la escuela de su hijo/a no se verá afectada.. De retirarse del estudio, no perderá ningún beneficio.

Consentimiento. Para pedir que su hijo/a no participe en este estudio simplemente llame o envíe una nota a la escuela, al maestro/a o a la Dra. Beth Doll para la siguiente fecha: __________. De usted no solicitar que su hijo/a no tome parte del estudio, su hijo/a participará en la reunión de la clase y las encuestas anónimas y étiquetarán los distintos mapas en grupo con otros estudiantes. Aún cuando su hijo/a no participe del estudio, y no complete las encuestas o los mapas, seguirá siendo parte de cualquier discusión que se genere dentro del salón.

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APPENDIX C: ClassMaps Research Teacher Consent

ClassMaps Informed Consent Form (Teachers, Others who help teachers)

**Project:** ClassMaps School and Playground Study

**Purpose of the research:** The purpose of the ClassMaps School and Playground Study is to help teachers improve the class learning environment. You are invited to participate because you are a teacher in a school that is using ClassMaps, or because a teacher asked you to help with ClassMaps in their class. Teachers using ClassMaps in their own class will spend between 1 and 5 hours working with the project. Others who are helping a teacher with ClassMaps will spend up to 2 hours participating in the research.

**Procedures:** All ClassMaps activities will occur in the classroom. First, students will complete anonymous surveys or playground maps asking about learning supports in the class. You will be asked to give non-participating students alternative work to do during this time. Next, a university researcher will give the teacher simple graphs that show the survey results. Most teachers will hold a classroom meeting to show the graphs to students, and ask for their ideas about how to improve the class. The teacher might also show this graph to parents, or to others who work with the class. Teachers will give the researcher information about the class including the grade, number of students, their ethnicity, and the percent of students working below grade level in reading and math. Some teachers may also give records of classwide behavior and activities to the researcher. Examples of classwide records include the percent of students who turn in homework, the number of discipline referrals made, class performance on weekly quizzes, or attendance rates. These records will always describe the whole class and will never describe any individual student.

Some teachers may also work with the researcher to improve their class. In this case, the teacher will make a plan for improving the class. Sometimes, other teachers or parents will help with the plan. More anonymous student surveys will be collected to see if the plan works. The teacher will also keep simple records to see if the plan works. Notes will be kept of the teacher’s plans and meetings.

**Risks and/or discomforts:** ClassMaps can be uncomfortable for teachers because suggestions for change can feel like criticism. However, these risks are minimal for the teacher and less than minimal for the students and others who help the teacher.

**Benefits:** Classes will benefit from ClassMaps because teachers will learn what to do to improve the class’s learning supports. Schools will benefit from the development of a new procedure for strengthening class environments for learning.

**Alternative resources:** As an alternative to ClassMaps, you may ask your school’s grade level teams or Student Assistance Teams for help in improving class practices.

_________Please initial that this page has been read.
Confidentiality. ClassMaps’ student surveys, playground maps, and graphs will not identify students, classes or teachers. Instead, all class records will be identified only by a number. Students will not write their names on the anonymous student surveys or playground maps. Once information from the student surveys or maps has been recorded in a data file, the surveys will be shredded. Records from this study will be stored for 5 years in a locked cabinet in the university researcher’s office and will only be seen by the researcher or graduate assistants. The information obtained in this research may be published in scientific journals or presented at professional meetings, but the data will be reported as group data and will not identify any participant, class or school.

Compensation. You will not receive any monetary compensation for participating in this project.

Opportunity to ask questions. You can ask questions about ClassMaps and get answers to your questions now or anytime during the research. Or, you may call Beth Doll to discuss the research, telephone 402 472 2238 or email bdoll2@unl.edu. If you have concerns about the study or if Dr. Doll cannot answer questions about your rights as a research participant, you can contact the University of Nebraska Lincoln Institutional Review Board, telephone 402 472 6965.

Freedom to withdraw. Your participation in this study is voluntary. You are free to decide not to participate or to withdraw at any time. If you withdraw from the study, it will not harm your relationship to Dr. Doll, the University of Nebraska-Lincoln or your school. If you withdraw, you will not lose any benefits that you are otherwise entitled to receive.

Consent. By signing, you are saying that you have decided to participate in this ClassMaps Consultation research project, and that you have read and understood the information above. You will be given a copy of this consent form to keep.

I have read and understood the information presented on this consent form and agree to participate in the study as described.

______________________________    __________________________
Signature                      Date

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