

A Descriptive Analysis of the Social Interaction Skills of First Grade Children

Lindsay M. Myatich

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Reading Committee:

Ilene Schwartz, Chair

Nancy Rosenberg

Charles Peck

Deborah Kartin

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Lindsay M. Myatich

University of Washington

Abstract

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Lindsay M. Myatich

Chair of the Supervisory Committee:
Professor Ilene Schwartz, PhD
College of Education

This study investigated the peer interactions of 11 typically developing (TD) and 15 children with an autism spectrum disorder (ASD) at the end of first grade. Data from 54 play observations were assessed and the frequency of social initiations and responses, social interaction skills (e.g., requesting, play organizing), and contextual variables (e.g., verbal content, number of games played) are described. Results revealed the frequency of peer interactions of children in the TD group were significantly different from the ASD group. Differences were further observed in the types of social skills children used during play. Implications for the selection of skills to use in social skills training groups for children with ASD are discussed.

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Dedication

The last four years have been an incredible journey, one that would have never begun without the encouragement and support of my family, friends, and colleagues. To my parents, William and Paula Wilson, thank you for teaching me to love learning from an early age. To my husband Scott, and my children Greyson and Deacon, thank you for your love and patience every step of the way.

A Descriptive Analysis of the Social Interaction Skills of First Grade Children

Social interactions influence every aspect of life. Even before the development of spoken language, nonverbal social interactions like smiling and cooing are an integral part of the relationship between a mother and child. As toddlers, children interact with others by using words to share what they observe (e.g., I see a duck!) as well as to make requests or demands (e.g., *my* truck). Social interactions become increasingly sophisticated over time and as experiences with new people and environments occur.

The advance of social interaction skills is a crucial part of child development. Children who are more socially skilled develop relationships with others and make friends easily at school. Strong social skills during early elementary school have been found to predict academic achievement for both typically developing (TD) children and children with autism spectrum disorder (ASD) in the later elementary school years (Estes, Rivera, Bryan, Cali, & Dawson, 2010). On the other hand, children with poor social skills are at a disadvantage for difficult relationships later in life (Odom, McConnell, & McEvoy, 1992).

Social-communication is one of the primary deficits of ASD. Therefore, most children with ASD struggle to engage in successful and age appropriate social interactions with others. Unlike TD children, children with ASD require direct and explicit instruction to develop social skills. Social skills training (SST) groups provide an evidence-based approach to deliver this instruction. SST groups have demonstrated positive results with school-aged children with ASD and related disorders, but applications of the intervention vary greatly across the research literature. In particular, the selection of skills for instruction, appropriate benchmarks for fluency, setting events and curricular content have undergone limited study.

Thus, there were two goals for this study. The first was to be able to describe the differences in peer interaction observed during play for two groups of children: one with all TD children, and a second group that included a child diagnosed with ASD placed with several TD children. It was hypothesized that the peer interactions of children with ASD would differ significantly from TD children. In addition to an assessment of overall interactions, I was interested in the extent to which several social skills often taught in social skills training groups was exhibited by children in both participant groups. Specifically, it was also anticipated that seven targeted skills selected for this study (i.e., commenting, turn taking, etc.) would be observed in most of the peer interactions, though it was expected that the frequency of each skill would vary between children in both participant groups. Finally, this study was also designed to investigate several of the setting and curricular factors related to social skills training groups that have been relatively unexplored in the literature at this time.

Literature Review

Defining Social Skills

Social skills are a collection of behaviors an individual uses to interact with others (Gresham, 1986). Social skills include both verbal behaviors and nonverbal behaviors. Some social skills are easy to observe directly, such as asking questions, commenting, making an offer of help, and extending a handshake, smiling, or nodding.

Other social skills represent a broader collection of behaviors that are more difficult, or even impossible to observe directly. Examples include social cognition, emotional recognition, and executive functioning skills (Stichter, O'Connor, Lierheimer, & McGee, 2012). Deficits in these social behaviors can impact a child's ability to acquire and process the contextual information necessary to engage in successful interactions with others (Stichter et al.).

Social competence refers to an individual's ability to use social skills to interact with others, to establish and maintain relationships, and to have personal needs and interests met (Stitcher et al., 2007). A socially competent child is able to apply social skills at the appropriate time to obtain a desired outcome. Socially competent children are accepted and befriended by others while children who lack social skills, on the other hand, are often rejected by the peer group (Strain & Kohler, 1988). Thus, addressing social skill deficits during the early years at school is critical to avoiding negative outcomes. Direct and explicit instruction specific to a child's social skill deficits has been shown to be an effective strategy for improving overall social competence outcomes (Ozonoff & Miller, 1995).

Social Skills Development in Early Elementary School

By early elementary school, typically developing (TD) children are using social interaction skills for a variety of purposes. A socially skilled child is able to proficiently

communicate with teachers, solve problems with peers, and to deliver messages between school and home (Mize, Ladd, & Price, 1985). School-aged children use social skills to acquire knowledge – by asking questions, sharing ideas, and commenting on what they, or others are doing and to develop relationships – by helping, listening, and sharing, for example.

One of the ways children continue to develop social skills at this age is through play (Feitelson & Ross, 1973). Samanci (2010) suggests that playing games with peers is an essential part of overall social development. By playing in a group, children develop an ability to work toward a common goal, to follow rules, and to share with others. According to Harris (1985), the content of peer interactions during play at this age are largely based in immediate events. That is, children talk about what they are doing, or what is going on in their immediate environment during play. Very few children at this age are observed to have decontextualized interactions (e.g., talking about something unrelated to the ongoing activity), though it is likely that they are developmentally able to engage in such interactions (Harris).

Successful peer interactions during play support the development of friendships. The main function of friendship during the preschool years is to mutually share in an activity (Bauminger, Shulman, & Agam 2004). Not surprisingly, children at this age often select peer partners, or friends, based largely on proximity (Cherry, 2014). However, children become much more selective about whom they choose as friends when they enter elementary school. Children who demonstrate desirable social characteristics, like sharing, taking turns, and listening are likely to be befriended by others, while those who engage in aggressive or problem behavior are avoided (Strain & Kohler, 1988). Further, friendship is important to social development because it teaches young children to regulate and display their emotions during interactions with peers (Bauminger et al.). Research suggests friendships at this age are relatively unstable (e.g., one's "best" friend may change daily) (Hay, Payne, & Chadwick, 2004); however,

simply having one reciprocal (i.e., mutually identified) friend in childhood is a protective feature against later peer rejection (Hay et al.). Reciprocal nominations, where two children identify each other as a 'friend' or 'best friend', have been shown to be more indicative of a true friendship than a unilateral nomination (Berndt & Candles, 2009).

In addition to supporting interpersonal relationships, strong social skills in young childhood have been shown to relate to positive, long-term outcomes. Children who are described as socially skillful are resilient under stressful conditions, seek help when needed, have stronger relationships with others, and, overall, are successful at school (National Association of School Psychologists, [NASP], 2014).

Developmental Considerations for Children with ASD

Autism spectrum disorder (ASD) is a developmental disability characterized by significant deficits in social interaction and communication (American Psychiatric Association [APA], 2014). The social development of children with ASD is atypical in comparison to other children. Developmental differences are observed in the child's ability to communicate for social purposes, change his or her interactions dependent upon the context of the situation or needs of the listener, and follow the rules for conversation and story telling (APA). In turn, these distinct differences impact the child's ability to use a host of different skills. For instance, children with ASD have difficulties initiating and responding, taking turns, sharing, asking questions, and using nonverbal communication (APA). In particular, elementary school-aged children with ASD have less mature play skills (Anderson, Moore, Godfrey, & Fletcher-Flinn, 2004; Pierce-Jordan and Lifter, 2005), have delayed joint attention skills (Paparella, Stickles Goods, Freeman, & Kasari, 2011), less efficiently identify social intentions from body language

(Centelles, Assaiante, Etchegoyhen, Bouvard, & Schmitz, 2013), and interact with others less frequently (Anderson et al.).

Skill deficits impact interpersonal relationships on a daily basis (Mackay, Knott, & Dunlop, 2007). It is more challenging for children with ASD to process and integrate information from the environment, to establish and sustain relationships, and to communicate with others (Bellini, Peters, Benner, & Hopf, 2007). A large body of research has also shown children with ASD have problems developing relationships with their peers in elementary school (Bauminger & Kasari, 2000; Kasari, Locke, Gulsrub, & Rotheram-Fuller, 2012; Rotheram-Fuller, Kasari, Chamberlain, & Locke 2010). Compared to TD children, children with ASD have fewer friendships, poorer quality of friendships, and experience loneliness more often (Bauminger & Kasari). For example, when social involvement of elementary-aged children with ASD was compared to a TD peer group, the children with ASD were found to be significantly less socially involved, less accepted, and on the periphery of social networks (Rotheram-Fuller et al.). While the children with ASD did not differ from TD children in their rates of reciprocal friendships in early grades, they became increasingly less involved in the social networks of their classmates as they progressed through elementary school (Rotheram-Fuller et al.). One possible explanation is that children with ASD may be perceived by their peers as uninterested in play, resulting in fewer bids to enter the peer group (Proulx & Poulin, 2013). Exclusion is especially problematic because the more the child is removed from the peer group; the fewer opportunities to enhance social interaction through practice exist.

Long term, a lack of peer relationships may present further struggles for individuals with an ASD (Solomon, Goodlin-Jones, & Anders, 2004; Stichter et al., 2012; Strain & Schwartz, 2002). Children without reciprocal peer relationships are observed to have higher rates of depression and anxiety in the adolescent years (White & Roberson-Nay, 2009) especially if

problems persist over time. Further, poor social skills can also have an adverse impact on long-term academic growth. In a study examining social skills and academic achievement for children with ASD, social skills at age six were shown to be predictive of academic achievement at age nine, specifically in word reading (Estes et al., 2010). Thus, effective interventions are essential during the early years of elementary school.

Group-based Social Skills Training

Social skills training (SST) groups are widely used and recommended for teaching social interaction skills to children with ASD. With the inclusion of more children with ASD in general education classrooms, as well as legislative mandates requiring the use of scientifically based instruction, there is an urgent need to provide educators with a framework to deliver social skills instruction in a way that improves student outcomes and is feasible to implement in a school setting.

To support the mass number of practitioners charged to deliver this instruction, experts in educational research at The National Professional Development Center (NPDC) on Autism Spectrum Disorders have established a series of resources to guide the use of their list of 27 evidence-based practices (Wong et al., 2014). Included in this list, are SST group interventions. Like all practices identified by the NPDC, implementation guidelines for SST groups provide explicit implementation directions developed from a review of the existing evidence base. Their recommendations for the implementation of social skills groups include: an identification of target skills, organization of groups of students with similar needs, a collection of baseline data on target behaviors, a schedule of regular group meetings, development of a structure for group sessions, organization of topics for instruction, selection of instructional strategies and materials,

training of group leaders, regular group meetings, and the collection of ongoing data to use to inform decision making (Collet-Klingenberg, 2009).

The implementation guidelines are a helpful framework for developing SST group interventions. However, they are written broadly and require the implementer to review the existing evidence base to design the SST group. In doing so, a practitioner may select skills based on one of the studies in the evidence base, but use a different study to select materials and instructional strategies. The extent to which the effectiveness of SST may change when one or more components identified in the study are adjusted remains unknown.

In addition to the work of the NPDC, several comprehensive and critical reviews of SST interventions have been published in the last decade. The earliest reviews have questioned the potential of SST groups to improve social outcomes and produce generalized behavior change (Rao, Beidel, & Murray, 2008; White, Koenig, & Scahill, 2007). More recent reviews continue to be critical, but support the viability of the social skills group as an effective practice, especially as additional SST group interventions continue to show positive outcomes, including several randomized control trials (Dawson & Burner, 2011; Reichow, Steiner, and Volkmar, 2012; Reichow & Volkmar, 2010). While there are a number of implications, which can be taken from the thorough reviews of the literature, issues relating to the skills targeted and/or the curriculum used to deliver instruction during SST groups has been relatively unexplored at this time.

Social Skills Groups in Early Elementary School

Despite an increase in the number of reported SST group studies, very few include one or more early elementary school-aged participants (i.e., five to seven years old). This is surprising, considering the increasing popularity of social skills groups in elementary schools. At this time,

only six published studies are available to review using social skills groups to provide skill-specific training for this age group. Table 1 lists each study. Three (Gonzalez Lopez & Kamps, 1997; Kamps, Leonard, Vernon, Dugan, & Delquadri, 1992; and Kamps et al., 2002) were conducted in school settings, and three were conducted in the clinic setting (Barry et al., 2003; Owens, Granader, Humphrey, & Baron-Cohen, 2008, and Stichter et al., 2012).

Targeted skills in School-based SST. All three school-based social skills training groups selected or adapted skills available from published curriculum (Table 1) and implemented groups with kindergarten and/or first grade participants. In each of the studies (Gonzalez Lopez & Kamps, 1997; Kamps, Leonard, Vernon, Dugan, & Delquadri, 1992; and Kamps et al., 2002) skills were taught to one or more children with ASD. Two of the studies (Gonzalez-Lopez & Kamps; Kamps et al.) included one child identified as having an ASD and three to five same-aged TD peers.

A review of the skills targeted during each intervention shows differences in the selection of both curriculum and skills (Table 1). For example, in the earliest available study, Kamps et al. (1992) taught 13 different skills to children with ASD over a one-year period. Skills included: initiating an interaction, responding to initiations, keeping an interaction going; conversations, greetings, and topics; giving and accepting compliments; taking turns and sharing; helping others and asking for help; including others in activities. Likewise, Gonzalez Lopez and Kamps (1997) also targeted a set of 12 skills to a group of TD children and children with ASD. Skills taught to groups of kindergarten and first grade participants included: saying hello, asking friends to play and answering, asking questions about the toys, keeping the conversation going by talking about the toys while playing, saying goodbye, imitation, following simple instructions, sharing and taking turns, asking for help and requesting. Finally, Kamps et al. (2002) taught three first-grade children with ASD a set of ten social skills: looking, using names, play organizers,

asking/answering questions, commenting, sharing materials, taking turns, demonstrating (imitating) play behaviors, and helping.

Targeted Skills in Clinic-based SST. Similar to the school-based interventions, Barry et al. (2003) taught four children with ASD to initiate and respond during greetings, conversations, and play opportunities. Group instruction was implemented using a curriculum, though no mention is made of how skills were selected (i.e., if they were included as part of the curriculum packaged). On the other hand, Stichter et al. (2012) used a SST group and a manualized curriculum to teach five complex social interaction skills: recognizing facial expressions, sharing ideas, turn taking in conversations, recognizing feelings and emotions of self and others and problem solving. Owens et al. (2008) compared two social skills training group interventions. The first, a LEGO therapy group, targeted joint attention; turn taking, sharing, joint problem solving, listening and other social communication skills (undefined by the researcher) during indirect, facilitated social skills groups. There was no manualized curriculum for the approach, rather a set of “LEGO Club Rules” which facilitators used to prompt contextually appropriate social interactions. The second intervention group, however, did follow a manualized curriculum (The Social Use of Language Programme [SULP], Rinaldi, 2004) systematically targeting several skills including eye contact, listening, turn taking, proximity, and prosody.

Comparisons Between Studies

Given the available information regarding practice standards and research on social skills training group interventions, several comparisons can be made in the existing evidence for early elementary-aged participants.

Target skills. Many different social skills, both discrete and complex, (Table 1) were targeted during SST. It was unfortunate that no study included an operationalized definition of each skill. Concern with variation among target skills has been critiqued in several reviews of

social interaction skills training for children with ASD (Rao et al., 2008; Reichow et al., 2012; White et al., 2007). In this sample, there was no way to infer, for example, if *turn taking* was, or was not measuring the same skill as *turn taking in conversations*. By one definition, a turn taking skill might include a nonverbal initiation or response to continue a game. In another, the skill might be applied to refraining from interrupting another peer. To further illustrate this point, all of the school-based studies included one or more nonverbal social interaction skills. However, nonverbal social interactions targeted by Kamps et al. (1992) included only sharing; while looking, sharing, and imitating were taught in the work by Kamps et al. (2002); and imitation, following directions, and sharing were taught in the study by Gonzalez-Lopez and Kamps (1997).

There were several notable differences between skills selected for school-based and clinic-based SST groups. All three clinic-based studies selected fewer target skills than studies conducted in the school setting. All targeted skills in school-based interventions were discrete, (e.g., saying hello, commenting, and helping), while, with the exception of Barry et al. (2003), clinic-based SST groups included mostly complex social skills, (e.g., recognizing facial expressions, problem solving).

Peer-Inclusive Groups. School-based interventions in this study included TD peers during SST sessions (Gonzales-Lopez & Kamps, 1997; Kamps et al., 2002), and during generalization observations (Kamps et al). On the other hand, no TD peers were included during SST for the clinic-based groups. With the exception of one study (Stitcher et al., 2012), TD children were included in generalization observations.

Sessions. School-based groups met several times per week, for short periods of time (e.g., 20-25 minutes). Social skills training was conducted during the school day, and continued anywhere from approximately twenty weeks (Kamps et al, 1992), to two years (Kamps et al.,

2002). On the other hand, clinic-based SST groups met for eight (Barry et al., 2003), eighteen (Owens et al., 2008), or twenty weeks (Stichter et al.). Sessions were approximately one hour in length with the exception of Barry et al., where groups met for two hours.

Ongoing data-based decision making. A single study of SST groups described changes in instructional delivery based on performance assessments (Stichter et. al, 2012). In the remaining studies, the shift to a new skill appeared to be made according to a pre-identified instructional time frame (e.g., one to two weeks per unit). This was an interesting observation, given the implementation guidelines established by the NPDC identify on-going data collection to inform decision making as a core component of the intervention.

Outcomes. In all but one study (Stichter et al., 2012), direct observation was used to assess the use of social interaction skills by children with ASD in generalized settings. In that study, pre- and post-intervention questionnaires, direct assessments (e.g., The Test of Problem Solving – 3 [TOPS-3: Elementary; Bowers et al., 2005]), and rating scales were used to measure improvements in overall social competence.

Each of the remaining studies included a direct observation of children with ASD at play. For example, Kamps et al. (1992) measured the social initiations and responses for children with ASD during 5-minute playgroup sessions. Results found social interaction behaviors increased from baseline to follow-up. Following intervention, children with ASD had mean social interaction rates of 3.05 combined interactions, as compared to only 1.73 interactions during baseline. Initiations were observed more often than responses in both conditions. Likewise, Gonzalez-Lopez & Kamps (1997) also measured social interactions during 5-minute play observations following SST groups. Similar to Kamps et al., (1992), children with ASD had mean social interactions between 1.8 and 4.0 during a return to baseline phase. In addition to overall observation of interactions, additional data assessed the use of selected social skills.

Gains were made for participants in several skills including greetings, nonverbal (e.g., following a peer's direction), and responding to a peer; however no changes were seen in asking for help, asking for materials, and giving materials to others, interacting for more than one minute, and initiating to more than one peer. Barry et al. (2003) also used direct observation to assess specific skills taught during SST. Significant improvements were observed during 5-minute play observations with TD peers for several of the taught social skills (e.g., greetings and play, conversations), while no improvements were made in the control skills.

Only two of the studies also provided comparison data for TD children. Kamps et al. (1992) found TD children showed increases in social interaction from an average of 3.8 interactions in a 10-minute baseline, to 5.9 interactions during follow-up. Gonzalez Lopez and Kamps (1997) found similar rates of interaction during a baseline condition (ranging from zero to four interactions), but did not collect any post-intervention data for this group.

Table 1
Skills Taught During Social Skills Training Groups

	Skills and Curriculum
Kamps, Leonard, Vernon, Dugan, & Delquadri (1992)	Initiating an interaction, responding to initiations, keeping an interaction going; conversations, greetings, and topics; giving and accepting compliments; taking turns and sharing; helping others and asking for help; including others in activities.
Gonzalez Lopez & Kamps (1997)	Saying hello, asking friends to play and answering, asking questions about the toys, keeping the conversation going by talking about the toys while playing, saying goodbye, imitation, following simple instructions, sharing and taking turns, asking for help and requesting things
Kamps et al. (2002)	Looking, using names, play organizers, asking/answering questions, commenting, sharing materials, taking turns, demonstrating (imitating) play behaviors, and helping
Barry et al. (2003)	Responding to and initiating a greeting, initiating and responding in conversation, responding to an invitation to play and requesting others to play
Owens, Granader, Humphrey, & Baron-Cohen (2008)	Joint attention, turn taking, sharing, joint problem solving, listening, eye contact, listening, turn taking, proxemics, and prosody
Stichter, O'Connor, Herzog, Lierheimer, & McGhee (2012)	Recognizing facial expressions, sharing ideas, turn taking in conversations, recognizing feelings and emotions of self and others and problem solving

Summary

An analysis of the components of SST groups and their relationship to improved social outcomes is a large task that has not yet been explored. Appropriate selection of target skills is a critical first step in this process. There is limited data available for the direct observation of social interaction in natural environments for both TD children and children with ASD. Assessing the social interactions school-aged children when a peer with ASD is, and is not included, is a valuable way to understand what it is necessary for children with ASD to learn to successfully participate in these environments. Thus, this dissertation will explore social interactions in groups of TD children, as well as groups of TD children that include a peer with ASD. Using a set of discrete social skills often taught to young children with ASD, an assessment of the use of these skills will also be conducted with both groups. Finally, several contextual factors – such as issues of content, materials, and collateral skills will be explored to provide recommendations for future research.

Research Questions

1. How frequently does a sample of typically developing children engage in social interaction during play at the end of first grade? How does this compare to children with ASD during the same time period?
2. To what extent are social interaction skills that are often taught in social skills groups (e.g., asking, sharing, commenting, play organizing) observed in the play of typically developing children at the end of first grade? How does this compare to the use of these skills in the play of children with ASD during the same time period?

3. What contextual variables are observed around the social interaction skills of typically developing children and children with an ASD at the end of first grade that may influence how practitioners teach social interaction skills to these children?

Methods

Participants

Twenty-six first grade children participated in this study. Fifteen (11 male, 4 female) were children with ASD who were part of the control group of a larger study, the Peer Networks Project (Kamps, et. al, 2013), an IES funded research project examining literacy and social skills. Eleven (7 male, 4 female) were a convenience sample of TD children from the control group of the Peer Networks Project. Inclusion criteria for children with ASD were: 1) a medical diagnosis or educational determination of ASD; 2) a score of 50 or higher on the Peabody Picture Vocabulary Test-IV (PPVT-IV, Dunn & Dunn, 2007); and 3) some functional language, defined as the ability to make one word requests and follow simple directions. Children were excluded if they had a score below 50 on the PPVT during initial assessment or if they scored at a second grade or higher level on two of three subscales on the Woodcock Johnson Mastery Test (Woodcock, 1987) reading measure at initial assessment. No entry criteria were established for the TD children.

As part of the assessment procedures in the larger study, children with ASD participated in three 10-minute play observations three times a year. The data used for this study were collected during the spring of their first grade year, which was their second year participating in the Peer Networks Project. For each child with ASD, a group of six TD children from their class was identified. Consent forms were sent home to all of the classmates of the control child with ASD. The first six children who returned consent to school were included in the project.

The 11 TD children involved in the current study were part of this group. When a play observation was conducted, the classroom teacher selected two TD children from this sample to participate, most often based on attendance on that day. Thus, play observations included a child with ASD and two TD peers from their classroom. In a small number of play observations (n=6) a second child with ASD joined the group because of scheduling needs, resulting in a group of four. The majority of play observations (n=24) were of a child with ASD and two peers.

In addition to participating as TD peers in the play observations for the ASD group, 11 TD children also participated in at least one additional 10-minute play observation in the spring of their first grade year for this dissertation study. Groups of three children were formed to create play observations of children without identified disabilities. These groups were arranged at the discretion of the teacher and largely based on individual schedules and attendance. No attempt was made to control for either group's composition according to gender and study participants did not have exposure to the Peer Networks Project intervention.

Setting and Materials

Play observations of the children with ASD took place in small instructional rooms (n=20), special education (n=5) and general education (n=3) classrooms, and common areas (n=2) within the school. For the TD sample, all of the 8 groups occurred in small instructional rooms. With the exception of the researcher, no other adults were involved in the observation. The primary role of the researcher was to set up the materials and monitor the play observation. A table was staged with up to four age-appropriate games and activities (e.g., Ned's Head, Memory, Uno, toy trains). These toys were a subset of the materials used in the play observation sessions in the Peer Networks Project. In collaboration with the classroom teacher, the researcher selected one of the four games or activities based on the preferences of the child with

ASD. The researcher was seated behind a video camera during the play observation. All observations were recorded and coded at a later date.

Measures

Social Interaction. The two primary measures of social interaction were initiations and responses. An initiation was defined as the focal participant starting a communication episode by spontaneously directing communication to a peer, or to the group as a whole. Responses were defined as communicative behaviors contingent upon a peer's previous communication act. Responses needed to occur within three seconds of the peer's previous initiation. If the response exceeded three seconds, it was then coded as a new initiation.

Social interaction behaviors were further categorized into one of the following secondary variables: (a) comment, (b) ask and share, (c) play organizer, (d) nonverbal, (e) help, (d) social nicety, and (e) turn take. Table 2 provides definitions for each of the seven variables. These variables represented the social interaction skills taught to the intervention group in the larger study.

Table 2

Social Interaction Definitions

Comment	describe events/actions, label objects or pictures, answer a question	<i>You got it; That's a dog; Sure</i>
Ask and share	offer toys or materials make a request, or ask a question.	<i>Here you go; Look at this; Do you have a 6?</i>
Play organizer	set up or organize play	<i>Let's play Uno; We are supposed to put pieces in castle</i>
Social nicety	compliment, be polite, or apologize	<i>I like your shirt; Thank you, I'm sorry</i>
Nonverbal	use a gesture to communicate	<i>Shakes head "yes"; shrugs shoulders to say 'I don't know'</i>
Turn take	request a turn, direct a peer to take a turn, or find out who's turn it is	<i>Can I be next?; It's your turn, Who's going to be first?</i>
Help	offer or accept help or assistance	<i>Can I help you?; I'll help you do that</i>

Contextual Variables. Several contextual variables were identified to be able to analyze additional factors that might be associated with the overall social interaction skills observed in the play observations. The contextual variables included: (a) games/materials, (b) context of initiations and responses, (c) verbal participation, (d) activity engagement, and (e) use of a child's name. Definitions and an example of each target behavior are provided in Table 3.

Table 3

Contextual Variables Definitions

Variable	Description
Games/materials	any item(s) one or more participants manipulated
Verbal Content	(a) off topic/perseverative, (b) immediate/game based, or (c) decontextualized topics unrelated to the game.
Verbal participation	(a) all, (b) some, or (c) no peers verbally participating in the activity
Activity engagement	(a) all, (b) some, or (c) no participants physically engaged with the games/materials in play
Name use	(a) the focal participant's name was, or (b) was not used.

Note: All variables were measured at one-minute intervals.

Procedures

Children were arranged around a table so each child's face was visible on the video camera. A single, verbal direction was provided to the group: "You get to have some free time today, so you may play and talk just like you do when you have free time. Your only rules are: stay at the table and play nicely with your friends." At that time, the observation began. For ten minutes, no instruction or feedback was provided. The researcher verbally redirected children only if they left their seats or engaged in problem behavior. If a child directed a question or comment to the researcher they were told to "ask their friends".

Data Collection

Direct observation of social interaction variables. Data were collected on each play observation using a hand-held portable data collection instrument using Noldus software to record a child's interactions into primary and secondary categories. The primary category classified the social interaction as an initiation or response directed toward a peer in the group.

The secondary category classified the interaction into one of seven categories of interaction (Table 2). For example, if a participant responded with the answer “You live in the jungle!” after a peer asked the question “Where do I live?” the interaction would have been recorded as a (a) response (*primary category*) and (b) comment (*secondary category*). This frequency data was collected for every initiation or response made by the focal participant during the 10-minute observation. The data collection tool automatically terminated recording after ten consecutive minutes. Observations were labeled with a unique name and uploaded to a computer for summary and analysis. Data were collected across a total of twenty-four observations of TD children and thirty observations of children with ASD. In all, data was collected for fifty-four 10-minute play observations.

Direct observation of contextual variables. The contextual variables were scored during separate viewings of the play observations. A one-page worksheet was developed to further analyze the contextual variables and overall social interactions for each of the fifty-four available play observations (Appendix A). Time-sampling techniques were used to score the contextual variables identified in Table 3. Each play observation was divided into 1-minute intervals, yielding a total of ten observations per participant. At the onset of each interval, the game/materials children were engaged with and their seating position (i.e. middle or end) was recorded. As additional games entered play, they were recorded. A frequency count of the overall social interactions made by the focal child was also recorded throughout each interval. Content, verbal participation, activity engagement, and name use were also coded throughout the interval. Measures of content, verbal participation, and activity engagement were assessed using a rating scale, and the use of the focal participant’s name was observed for occurrence/nonoccurrence. At the end of one minute, the videotape was paused and observations of the background, gender composition of the group, and setting were recorded.

Data were collected according to the procedures above for the twenty-four play observations of TD group. This yielded 240 unique 1-minute intervals available for analysis (8 play observations X 10 intervals X 3 TD children in each group). Thus, each group was coded three times, once for each child in the group. In addition, identical data were collected for the thirty children in the ASD group. This yielded a total of 300 unique, 1-minute intervals (30 play observations X 10 intervals X 1 child with ASD in each group) available for analysis.

Training and Reliability. Two graduate-level research assistants (the author and one additional staff member from The Peer Networks Project) coded the videos for social interaction. Both staff were previously trained according to a project staff coding manual developed for the larger study. Therefore, no additional training was required to conduct the initial scoring pass of the play observations in the present study. Reliability was calculated for twenty-five percent of the total play observations. The overall percentage agreements for all play observations exceeded 87%.

The observational measures of contextual variables were operationalized in a coding manual as well, developed specifically for the present study (Appendix B). The author independently scored each of the fifty-four play observations.

Data Analysis

Direct observation of social interaction variables. Descriptive group statistics and independent sample *t*-tests were used to answer the first research question: *how frequently does a sample of typically developing children engage in social interaction during play at the end of first grade? How does this compare to children with ASD during the same time period?*, analyses were conducted using SPSS-16 for the 24 play observations of the TD children and 30

play observations of children with ASD. Thus, analyses were conducted for a total of 54 play observations.

First, descriptive group statistics were obtained for both groups to assess the range, mean, standard deviations, and standard errors for social initiations, responses, and combined (initiation + response) interactions.

Next, data were assessed for normalcy, skewness, kurtosis, and to determine if the assumptions of homogeneity of variances had been met. If so, independent samples *t*-tests were conducted to compare the means between groups.

Finally, each of the 54 scores for overall social initiations, responses, and combined interactions during a play observation were placed on a scatterplot. The relationships between individual scores for both groups were described by comparing scores exceeded one standard deviation of the mean for the TD sample.

To answer the second question: *to what extent are the social interaction skills often taught in social skills groups (e.g., asking, sharing, commenting, play organizing) observed in the play of typically developing children at the end of first grade? How does this compare to children with an ASD during the same time period?*, each of the secondary behavioral variables identified in Table 2 were entered into SPSS-16 so the range, means, standard deviations, and standard errors could be calculated and described. Next, data were inserted into an Excel file to assess the extent to which the children in the ASD and TD groups used the seven skills that had been part of the intervention for the Peer Networks Project.

Direct observation of contextual variables. To answer the third, and final, research question: *What contextual variables are observed in both the social interaction skills of typically developing children and children with an ASD at the end of first grade that may influence how practitioners develop social skills groups?*, the data from 54 contextual variable worksheets

(Appendix A) were entered into Excel and data were sorted to enable descriptive analysis of variable categories.

First, for the dependent variable *games/materials*, the games listed in each interval were coded into one of three categories describing the number of games in play during the 10-minute observation: (a) single game, (b) two games, (c) three or more games. A percentage for each of the three categories was calculated where each of the codes (a-c) was divided by the total number of group observations. Total games played were analyzed for 30 play observations of children with ASD and eight play observations of typically developing children. The reduced number of observations for the typically developing sample was because three participants were observed in a single play observation. Therefore, there were only eight unique play sessions, yielding interaction data for 24 TD children

Context variables were coded to analyze what children talked about during the play observations. The context variable was scored in 240 intervals for typically developing children and 300 intervals for children with ASD. Three percentages were calculated for each group: percent of intervals of off topic/perseverative talk; percent of intervals of decontextualized topics unrelated to the game; and percent of intervals of immediate/game-based topics / total intervals.

Likewise, percentages were also calculated for the variables *verbal participation* and *activity engagement*. In all 240 intervals for typically developing children and 300 intervals for children with ASD, three percentages were calculated to analyze the extent to which all, some, or none of the peers verbally participated in the activity (i.e., offered one or more initiations and/or responses) as well as the extent to which all, some, or none of the participants engaged with the games/materials.

Finally, name use was scored in 240 intervals for typically developing children and 300 intervals for children with ASD. Four percentages were calculated for each group. First,

intervals were scored where the focal participant's name was used / total intervals as well as intervals where the focal participant's name was not used / total intervals. Next, using the numerator in each of the above groups, a percentage was calculated based on the focal participant's social interaction (occurrence/nonoccurrence) when (a) their name was used, and (b) when their name was not used.

Results

Similar to the previous section, results from the present study will be organized by research question.

Research Question 1: How frequently does a sample of typically developing children at the end of first grade engage in social interaction during play at the end of first grade? How does this compare to the frequency of social interactions in children with ASD during the same time period?

The data collected on social interactions is described in the following three sections: combined social interactions (a calculation of the initiations + responses), initiations, and responses. The mean scores, standard deviations, range, and p -values for both groups are reported in Table 4. Observed differences between in the means for combined interactions, initiations, and responses are presented in Figure 1.

Children's Total Peer Interactions During Play

As shown in Figure 1 and Table 4, there was a statistically significant difference between the mean combined social interactions for the ASD group and TD group $t(52) = 2.41, p = .019, d = 0.67$. The ASD group ($M = 24.90, SD = 16.29$) demonstrated, on average, 9.68 fewer combined social interactions per ten minute time period than the TD group, $M = 34.58, SD =$

12.21. Combined interactions ranged from zero to 56 interactions for the ASD group, and 13 to 64 interactions for the TD group.

Individual combined interaction scores for both the ASD and TD groups are illustrated Figure 2. Each data point represents the total combined interaction scores for a participant (30 ASD, 24 TD). The 29 scores that fell within +/- 1 standard deviation of the mean for typically developing children (i.e., mean scores between 22.37 and 46.79) are displayed in the shaded portion of the figure. Thirteen scores were within this range for the ASD group, while 16 were from the TD group.

Nine children had scores that exceeded one standard deviation of the mean for the TD group. Of those eight, four children were from the ASD group, while five were from the TD group. Seventeen scores fell more than one standard deviation below the TD mean. Of those 17 scores, 14 were from the ASD group. In taking a closer look at the lowest scores across both groups, while the lowest score for a child in the TD group was 13 combined interactions, eight of the children in the ASD group had scores which were lower than 13.

Table 4

Descriptive Statistics

		<u>N</u>	<u>Mean</u>	<u>Min</u>	<u>Max</u>	<u>Std. Deviation</u>	<u>p-value</u>
Combined Interactions	TD	24	34.58	13.00	64.00	12.21	.019*
	ASD	30	24.90	0.00	56.00	16.29	
Initiations	TD	24	16.00	8.00	32.00	5.71	n/a
	ASD	30	12.63	0.00	34.00	9.32	
Responses	TD	24	18.50	3.00	40.00	9.79	.020*
	ASD	30	12.27	0.00	31.00	9.21	

* $p < .05$

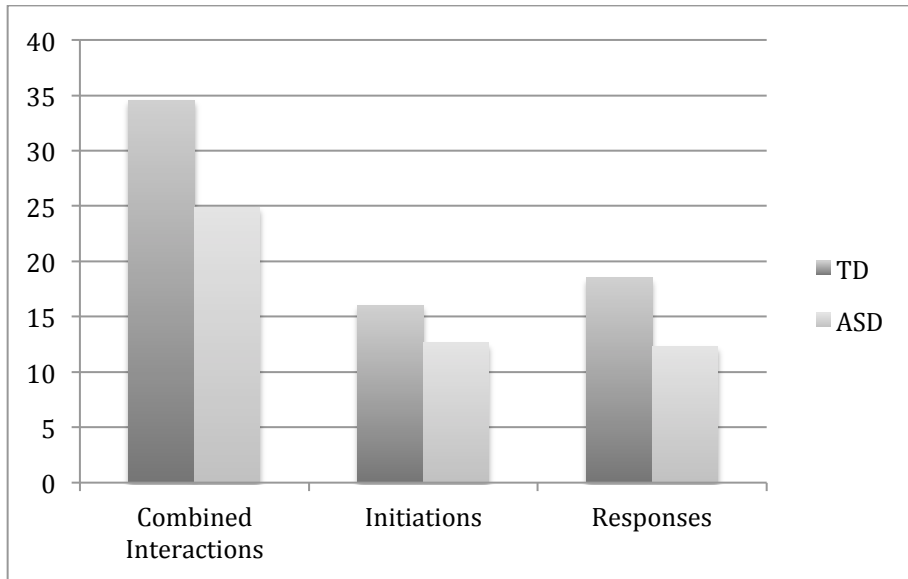


Figure 1. Mean Peer Interactions by Group

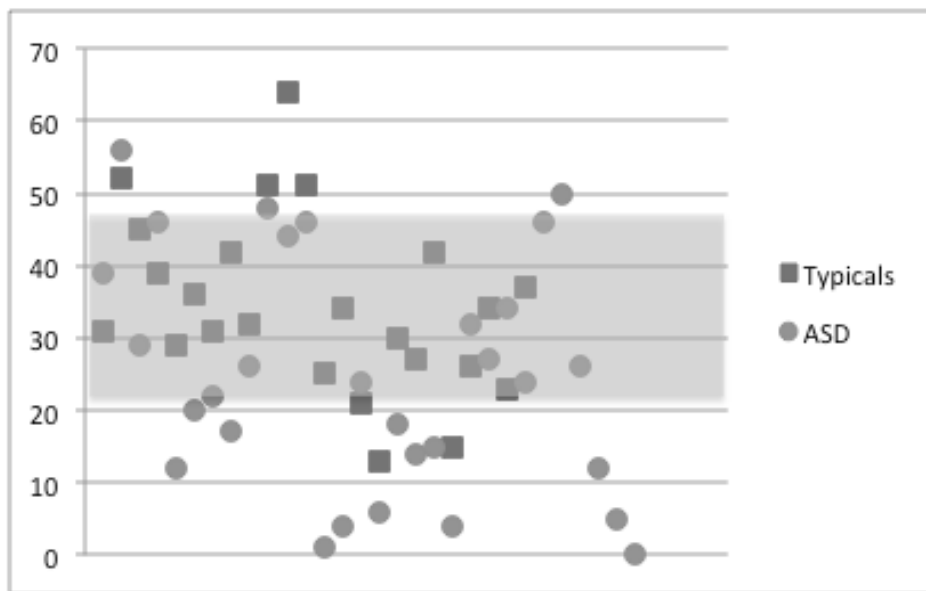


Figure 2. Individual Combined Peer Interaction Scores with Mean for TD Group Shaded

Children’s Peer Initiations During Play

The mean social initiation score for the ASD group ($M = 12.63, SD = 9.32$), was lower than the TD group ($M=16, SD = 5.71$) (Figure 1). The ASD and TD sample distributions were abnormal and the assumption of homogeneity of variances was unsatisfied according to Levene’s F test $F(52) = 7.35, p = .009$. Thus, differences between the means were not assessed. On

average, children in the ASD group initiated 3.37 fewer times than the TD group. Social initiation behaviors ranged from zero to 34 in the ASD group and 8 to 32 in the TD group.

Individual initiation scores are reported in Figure 3, and scores falling within ± 1 standard deviation of the mean for the TD children (i.e., between 10.29 – 21.71) are displayed in the shaded portion of the graph. There were extreme differences observed in the distribution of the initiations between the two groups. For example, 20 out of the 24 scores for the TD group were within the highlighted range. The most striking difference can be observed in the number of children with ASD who initiated at rates below one standard of the mean for the TD group. As compared to one TD child whose initiations fell within this range, twelve children with ASD were observed to have low rates of initiation. Further, three children with ASD did not initiate at all during the observation. Also interesting was that more children in the ASD group were observed to be high initiators, with 24, 26, 31, and 34 initiations during the observation. Specifically, there were four children with ASD in this range, and only three TD children.

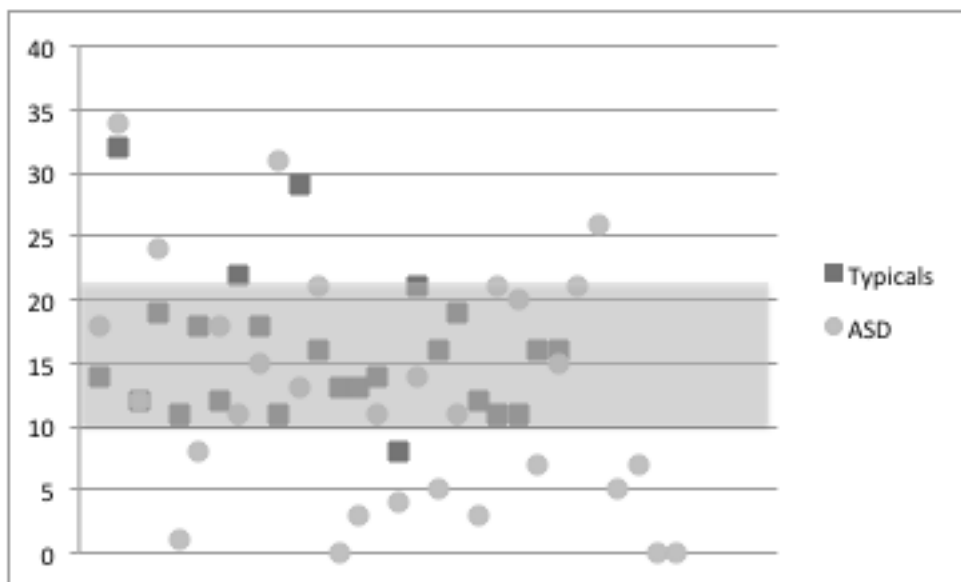


Figure 3. Individual Scores for Peer Initiations with Mean for TD Group Shaded

Children's Peer Responses During Play

A statistically significant difference between groups was observed in the frequency of peer responses. Children in the ASD group responded significantly less frequently than children in the TD group $t(52) = 2.40, p = .02; d = 0.31$. On average, the responses of children in the ASD group ($M = 12.27, SD = 9.21$) were 6.23 fewer per ten minute time period than the responses of children in the TD group, $M = 18.50, SD = 9.79$, (Figure 1). Peer responses ranged from zero to 31 for children with ASD and from three to 40 for typically developing children.

As shown in Figure 4, 17 out of 30 scores for the ASD group and 15 out of 24 scores for the TD group fell within ± 1 standard deviation of the mean for typically developing children (i.e., between 8.71 and 28.29 responses per observation). Children with ASD responded much less frequently than the TD children. For example, out of the 19 scores which were below one standard deviation, 14 were scores of children with ASD. On the other hand, while four TD children responded to peers at a relatively high rate (33,35,35, and 40 responses, respectively), only one child with ASD was observed to respond to peers more often than an average TD child was likely to respond (31 responses).

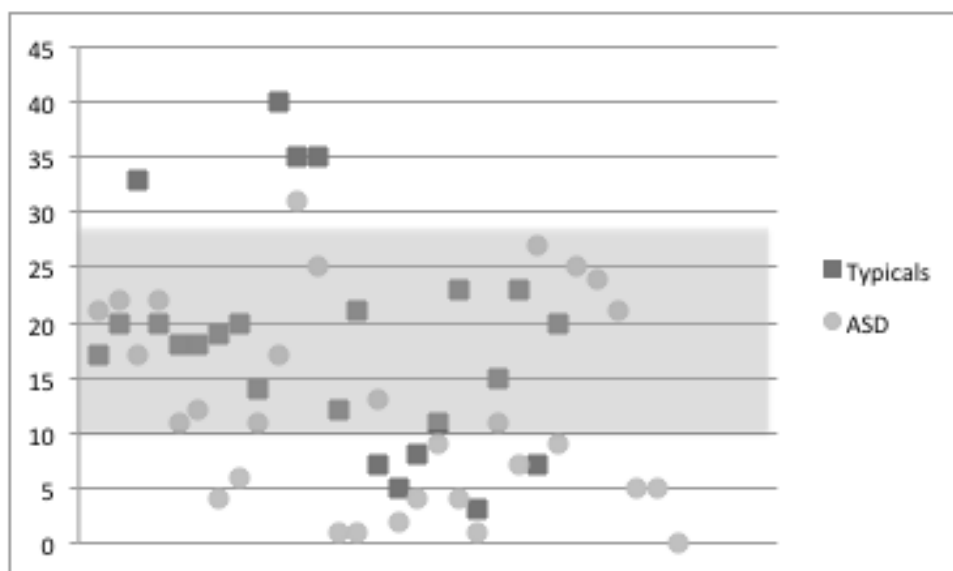


Figure 4. Individual Scores for Peer Responses with Mean for TD Group Shaded

Research Question: To what extent are social interaction skills often taught in social skills groups (e.g., asking, sharing, commenting, play organization) observed in the play of typically developing children at the end of first grade? How does this compare to children with ASD during the same time period?

Description of Social Skills Used

Table 5 shows how often children performed each of the seven interaction skills (e.g., commenting, helping, etc.) during a play observation. The descriptive statistics for each of the social interaction skills are reported in in Table 4. All scores are reported based on the mean number of initiations and responses for a 10-minute sample. Figures 5 and 6 illustrate the total percentage of children in each group who were observed to use the identified social skills during play for initiations and responses respectively. These data are further described in Figures 7 and 8 that present the mean number of initiations and responses across skills for the TD and ASD groups.

Commenting. The majority of children in both the ASD and TD groups talked with their peers by making comments. With the exception of one child in the TD group and two children in the ASD group, all participants used comments to respond during play. All but one observation from the TD group (n=23) included comments to initiate, however, this was observed less frequently (n=20) in the observations of the children with ASD. Children from the TD group were also observed to use more comments during play. On average, they initiated 1.47 more comments and responded with 2.75 more comments compared to the ASD group.

Ask and Share. As mentioned earlier, this study defined ask and share behaviors as *offering toys or materials, making a request, or asking a question*. As with commenting, most of the TD children were observed to ask and share during play. All TD children initiated and all

but one responded by asking and sharing across all play observations. This was observed to a lesser extent in the play observations of children with ASD. All but four children with ASD initiated by asking and sharing, but only slightly over one-third of children responded using this skill. Also similar to the use of commenting, TD children used the ask and share skill more often than the ASD group. However, whereas comments were used more often to respond to peers for both the ASD and TD groups, the ask and share skill was observed to be used more often to initiate an interaction. There were still differences in the average number of ask and share interactions used between the two groups. In fact, the only statistically significant difference between the two groups was for ask and share responses. Children with ASD had an average of 1.79 fewer responses than the TD group using the ask and share skill, which was statistically significant at the .02 level.

Play Organizer. There were large differences observed between the two groups in play organization. Children in the TD group used play organizers in more than two-thirds of the play observations. Nineteen children used play organizers to initiate an interaction, and 16 children used the skill to respond to a peer. On the other hand, only 10 children in the ASD group used play organizers to initiate play, and even fewer (3) used play organizers to respond. Once again, the children in the TD group who did use play organizers used them more frequently than their peers in the ASD group. On average, every child in the TD group used approximately 2 play-organizing statements to initiate play, while only 1 out of every 2 children with ASD used a play organizer. Likewise, every child in the TD group used a play organizer as a response at least once during play, while only 1 out of every 3 children with ASD used a play organizer to respond during play.

Social Niceties. Few children in either group used social niceties during play, though children from the TD group continued to use social niceties more frequently than their peers with

ASD. Overall, while seven TD children used social niceties to initiate or respond, only a single child with ASD used a social nicety across all observations. For both groups, social niceties were more often used as a response than an initiation.

Nonverbal. Nonverbal initiation was observed in only seven play observations for TD children, and 3 for children with ASD. In both groups, the children who did initiate using nonverbal communication did so between 1 and 3 times per observation. On the other hand, children with ASD used nonverbal communication to respond more often than the TD children. One child with ASD, in particular used nonverbal communication to make 10 responses during a play observation. No child in the TD group exceeded 5 nonverbal responses per observation.

Turn Take. Neither group was observed to use turn taking language very often. For both initiations and responses, turn taking language was only used once, or twice, at most during a play observation. More children with ASD used turn taking to initiate and respond to their peers. Specifically, seven children used turn taking to initiate, and six used turn taking to respond. Quite the opposite was observed in the skill use of children in the TD group. Here, only 1 child initiated, and 1 child responded with turn taking language across all of the observations.

Help. Not a single child initiated help from a peer in any of the fifty-four play observations. Only one child in each of the ASD and TD groups was observed to offer help to a peer during a play observation.

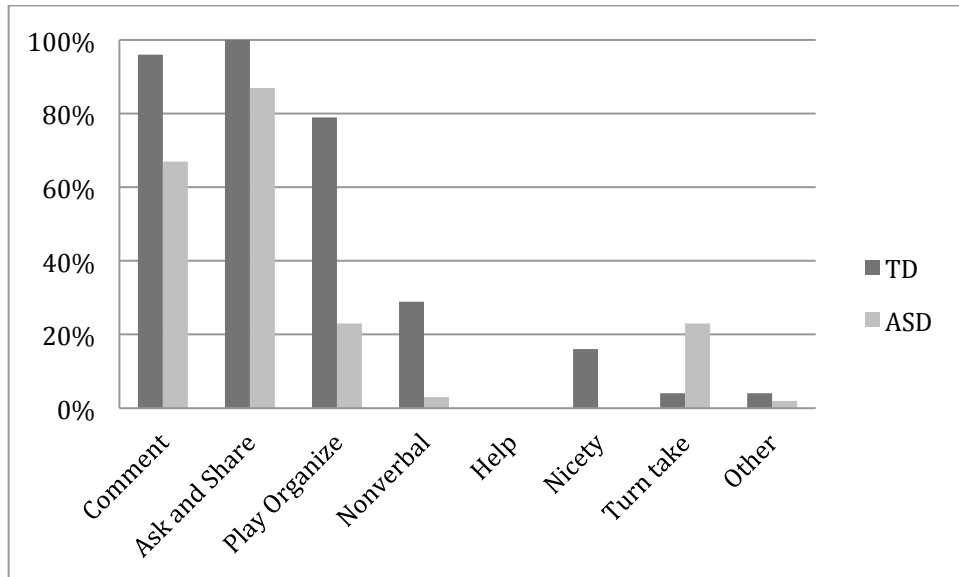


Figure 5. Percentage of Children Using Skill to Initiate Peer Interaction

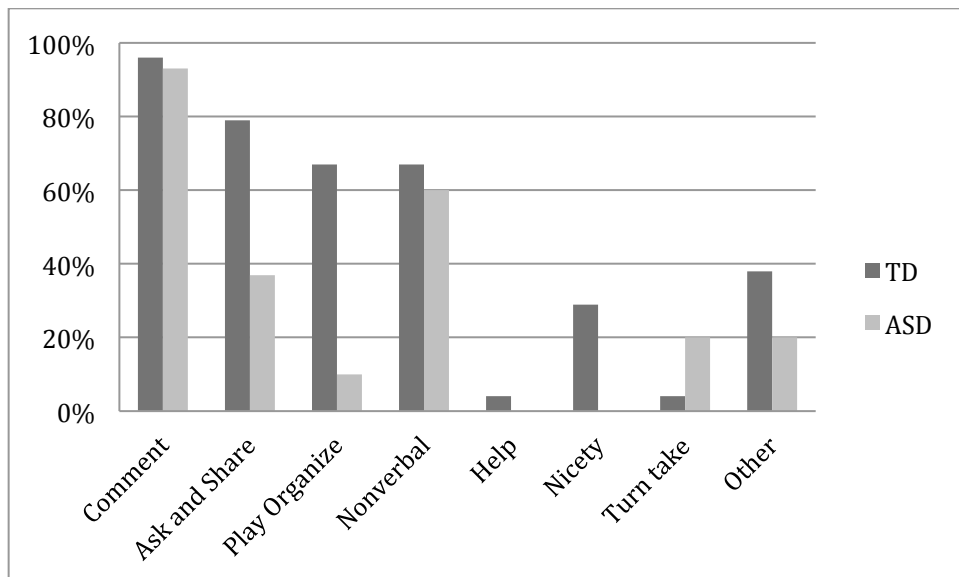


Figure 6. Percentage of Children Using Skill to Respond to Peer Interaction

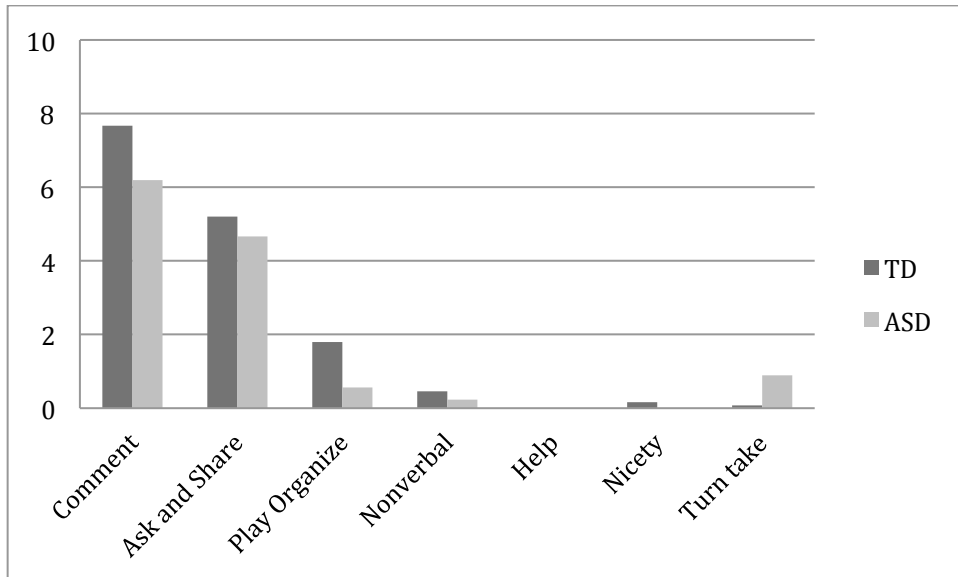


Figure 7. Mean Initiations by Skill

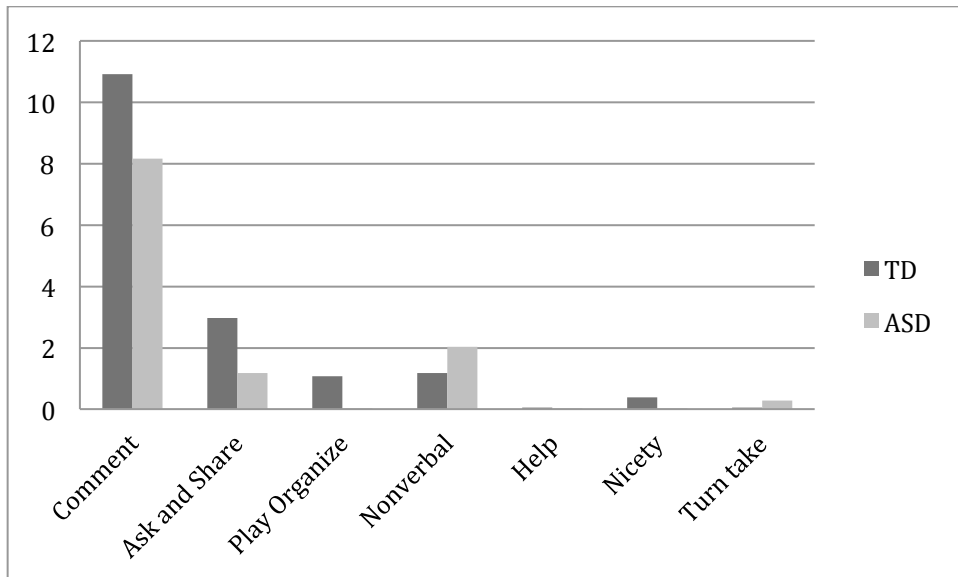


Figure 8. Mean Responses by Skill.

Table 5

Summary of Descriptive Statistics by Social Interaction Skills

		<u>TYPICAL</u>			<u>ASD</u>			
	Range	Mean (SD)	Total observations	% of overall interactions	Range	Mean (SD)	Total observations	% of overall interactions
<hr/>								
Comments								
Initiations	0-16	7.67 (3.36)	23	52%	0-16	6.20 (4.46)	20	48%
Responses	0-31	10.92 (7.55)	23	59%	0-20	8.17 (6.78)	28	70%
Ask and Share								
Initiations	1-14	5.21 (3.29)	24	31%	0-14	4.67 (4.72)	26	32%
Responses	0 -15	2.96* (3.31)	23	15%	0-10	1.17 (2.26)	11	6%
Play organizer								
Initiations	0-9	1.79 (2.25)	19	11%	0-6	0.57 (1.35)	7	4%
Responses	0-4	1.08 (1.06)	16	9%	0-5	0.33 (1.09)	3	1%
Nicety								
Initiations	0-1	0.17 (.38)	7	1%	0-1	0.00 (.00)	3	0%
Responses	0-3	0.38 (.71)	16	2%	n/a	0.03 (.18)	18	<1%
Nonverbal								
Initiations	0-3	0.46 (.88)	0	3%	0-3	0.23 (.73)	0	2%
Responses	0-5	1.17 (1.24)	1	7%	0-10	2.03 (.27)	1	15%
Turn take								
Initiations	0-2	0.08 (.41)	4	<1%	0-1	0.90 (2.65)	0	4%
Responses	0-1	0.04 (.20)	7	<1%	0-2	0.27 (.18)	1	1%
Help								
Initiations	n/a	0.00 (.00)	1	0%	n/a	0.00 (.00)	7	0%
Responses	0-1	0.04 (.20)	1	<1%	n/a	0.03 (.18)	6	<1%

Note. *p < .05

Research Question: What contextual variables are observed in both the social interaction skills of typically developing children and children with ASD at the end of first grade that may influence how practitioners develop social skills groups?

Contextual Variables for Play Group Observations

Games. In all, a total of eight different games were available for the project staff to select when setting up a play observation. As mentioned earlier, researchers were able to select four games for each play observation from the available inventory of age-appropriate games used in the Peer Networks Project. Results showed every game offered was selected for play by at least one group. Offered games included: Ned's Head, Guess What I Am, Memory, Uno, Trains, Pop the Pig, Candyland Castle, and Zingo. Figure 9 summarizes the number of games played by group.

Children in both groups began to interact with the materials almost immediately and to continue to play with them throughout the observation. In fact, all TD children (100%) were engaged throughout the play observation. The same was observed in 81% of the observations for children with ASD.

At least one game was in play for 98% of the total play intervals for TD group and 99% of the total play intervals ASD group. In all, there were only seven intervals where children were not playing with a game. During those intervals, children were generally talking about how to organize play before handling a game.

On the other hand, the overwhelming majority of groups switched games one or more times during play. Of the eight TD playgroups, only one group played with the same game (trains) during the ten-minute play session. Half of the groups (n=4) played with two games, and three groups played with three or more games. Further, children

were observed to often play with multiple games even within a one-minute time sample. In nearly half of all intervals (45%) multiple games were observed to be in play. For example, in one observation, children were observed to alternate play between Guess What I Am and Ned's Head at the same time. The results were similar among the thirty group observations of play for children with ASD. Only four groups (13%) played with a single game, while eighteen (60%) played with two, and eight (27%) played with three or more games in ten minutes.

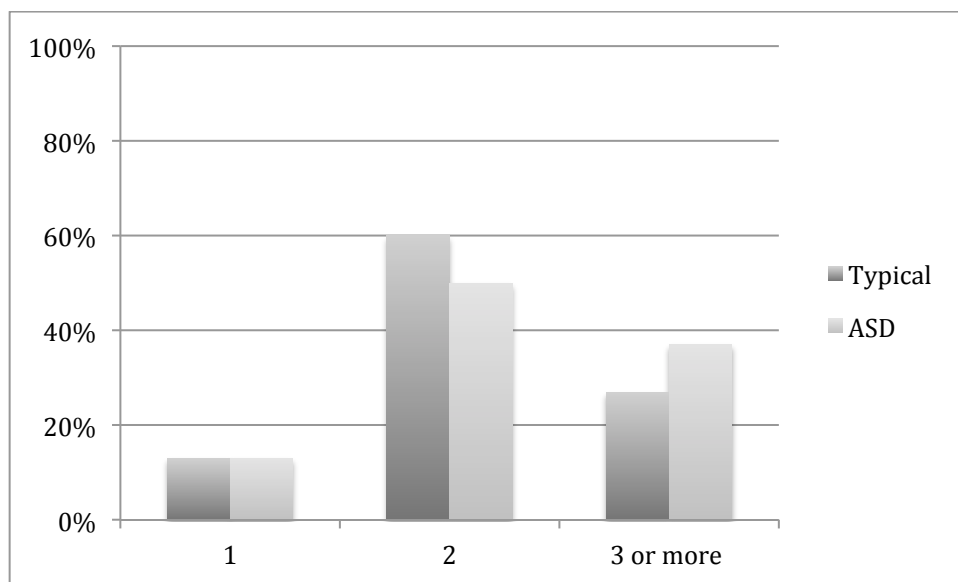


Figure 9
Number of Games Played by Group

Verbal Content. Social interactions for both the TD and ASD groups were largely focused on the game they chose to play, as shown in Figure 10. Specifically, 97% of the intervals of social interaction observed in playgroups with a child with ASD were game-specific. In a typical example of reciprocal interaction, a child from the ASD group made the statement “I keep getting 9’s!” during a game of Uno, and a peer responded by requesting “Let me see the cards!” The peer interactions observed in the play groups with only TD children were also largely game oriented (87%), though not as much so as

the interactions observed in the ASD group. No children used perseverative talk in play observations.

Children occasionally used social interactions that were decontextualized. This was observed in 13% of play intervals for typically developing children and 3% of intervals for the ASD groups included social interaction topics unrelated to the game/activity. For example, one of the TD groups had a brief conversation about an earlier recess activity.

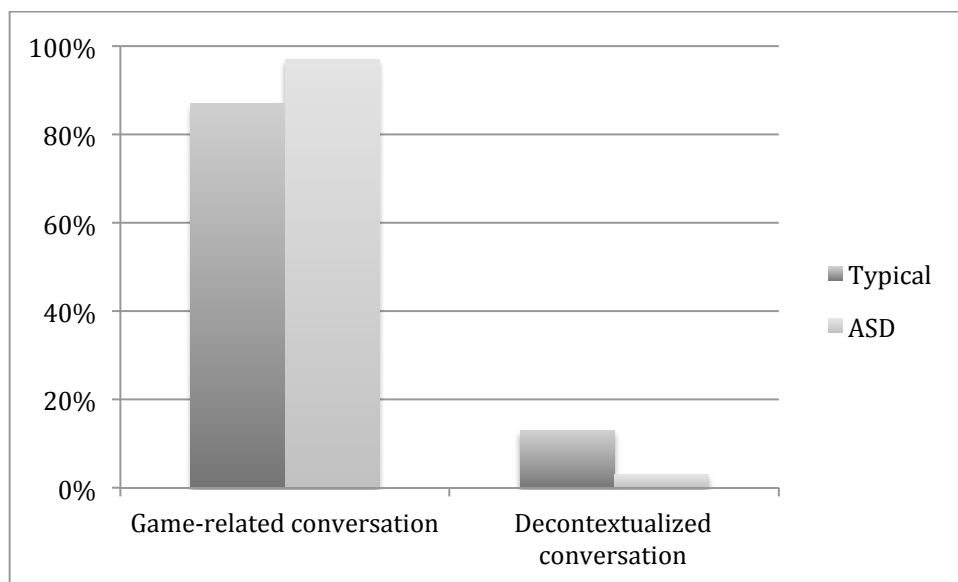


Figure 10
Content of Conversations during Play

Names. The use of a peer's name was much less frequently observed in the TD group as compared with the ASD group (Figure 5). In fact, only nine of the 24 individual observations showed that a TD child used a peer's name. When a child in the TD group's name was used, they were observed to initiate or respond during that same interval. On the other hand, even when a typical child's name was not used, they were observed to offer a verbal initiation or response in 96% of all intervals. Thus, not only did using a peer's name not appear to be a skill that the TD group used, the frequency of

participation (more than 96% of all intervals) suggests TD children did not need to use names as a strategy to engage in an interaction with a peer.

Unlike the TD group, the peers who participated in the ASD group were observed to use the name of the participant with ASD more frequently. In fact, the child with ASD's name was used by a peer in 26 of the 30 play observations. For all observation intervals where a TD child's name was used, he or she also interacted with peers at least once during that interval. On the other hand, for all observation intervals where a child with ASD's name was used, he or she only interacted with peers 35% of the time.

Table 6

Child's Name Use by Group and Peer Interactions Observed

		Typical	ASD
Focus child's name used	6%		35%
Peer interaction observed		100%	35%
No peer interaction observed		0%	65%
Focus child's name not used	94%		65%
Peer interaction observed		96%	65%
No peer interaction observed		4%	35%

Discussion

The purpose of this study was to better understand how children in first grade interacted with one another during play and the extent to which they used certain social skills during these interactions. In particular, this study sought to assess the differences in peer interactions for children with ASD and TD children.

In addition to how often children interacted, and the types of social skills they used, this study also explored setting events and curricular content— such as the topics of children’s conversations, the games they chose to play, and if children used one another’s names during play.

The results supported the original hypothesis that the social interactions of children with ASD would differ significantly from the social interactions of TD children. Overall, children with ASD engaged in fewer initiations, fewer responses, and fewer combined interactions with their peers, with statistically significant differences observed in both combined interactions and peer responses. Direct observations of a set of social skills frequently taught during SST also revealed differences between groups related to both the skills children used, and how often they used them in peer interactions. Surprisingly, several social skills hypothesized to be used during play, such as helping, turn taking, and social niceties were rarely observed in either group.

The results from an assessment of setting events and curricular content related to play revealed several interesting findings as well. First, this study observed the verbal content of the children’s interactions during play. Overall, when children were given games to play with little or no adult direction, the majority of peer interactions were mostly based in immediate events. That is, children talked about the game they were

playing, or occasionally, topics related to the game. Rarely were any groups in the sample observed to have conversations about unrelated or decontextualized topics (e.g., what happened in science class earlier in the day). Even when conversations about unrelated topics did occur, they were very brief (no more than two minutes). Additionally, an assessment of the games children played also provided several insights. Across the majority of the groups, children appeared to engage with games for brief periods of time. As mentioned earlier, each group was given four games to play with during an observation. In the majority of play observations, however, children played with multiple games, sometimes several at a time. Very few groups played with a single game from the start of the observation to the end. Finally, this study assessed how often children used one another's names during play. After an entire year in the same class, most children in the sample likely knew the names of the peers in the play observation groups, yet, children in both groups seldom used another child's name during play. Notably, the names of children with ASD were used more frequently than names of TD children.

In the next section, these results will be further discussed according to the specific research question that was addressed and will include possible explanations for the findings. The paper concludes with implications for future research and recommendations for the implementation of SST groups.

How frequently does a sample of typically developing children at the end of first grade engage in social interaction during play? How does this compare to children with ASD at the same time period?

Without exception, all of the TD children initiated, responded, and engaged in social interaction with their peers during the play observations. By comparison, these behaviors were observed less frequently in the peer interactions of children with ASD. This finding is consistent with previous research documenting children with ASD as less adept at engaging in social interactions with their peers (Anderson, Moore, Godfrey, & Fletcher-Flinn, 2004; Bauminger, Shulman, & Agam, 2003; Jahr, Eikeseth, Eldevik, & Aase, 2007; McGee et al., 1997).

Higher mean peer interaction scores were found across initiations, responses, and combined interactions for TD children. However, the differences between means were not as large as were expected. As an example of this, mean initiations for the TD children were, on average, 1.6 initiations per minute; while children with ASD engaged in 1.3 initiations per minute. One might compare the means and conclude that children with ASD in the sample initiated nearly as often as the TD children, which is not the case. In fact, the mean scores likely overestimate the average interactions of the children with ASD, considering several outlying scores in the sample, as well as the relatively small sample size.

Overall, the individual scores for combined interactions, initiations, and responses shows nearly half of all peer interaction scores for children with ASD were not within one standard deviation of the peer interaction scores for the TD group. Again, this finding was not surprising. Prior research has demonstrated children with ASD engage in social interaction less frequently than TD children (Murdock, Cost, & Tieso, 2007). Notably, children with ASD were observed to initiate to peers slightly more often than they responded to peers. However, this finding should be interpreted cautiously. Of the

individual scores that were below the mean for the TD group, all but one belonged to a child with ASD. In fact, while every TD child initiated at least once during play, three children with ASD never initiated at all. On the other hand, out of all of the scores that were above the mean for the TD group, two of the three highest scores also belonged to children with ASD. Thus, the few students that interacted at very low and very high rates contributed to the overall mean score. Excluding these extreme scores, it becomes clear that the majority of children with ASD were clustered well below the mean of the TD group, which is consistent with previous research suggesting children with ASD have pronounced difficulty with social initiations (Stone & Caro-Martinez, 1990, in Thiemann & Goldstein, 2004).

Although several students with ASD had very high numbers of interactions, this does not necessarily suggest they were highly proficient at socializing. In fact, a closer look at their interactions suggests that their high individual scores might be further explained by considering several of the characteristic features associated with an ASD diagnosis. For instance, children with ASD are observed to have an inflexible adherence to routines and a desire for sameness (American Psychiatric Association, 2014). This point is illustrated through an observation of the peer initiations of the child who had the highest social initiation score in the sample. During the observation, this particular student became upset when her peers chose to deviate from the traditional rules for one of the games (i.e., Ned's Head). Throughout the observation she perseverated on this issue by repeatedly asking, "Can we play by the rules? Do you want to play the right way?" In fact, she was never observed to engage in any meaningful, or reciprocal conversation during the play observation. Rather, she made repeated requests or statements about the

rule violation without problem solving. Thus, while her score may appear to represent the initiations of a socially skilled child, she was unable to use a skill she had obviously learned (i.e., play organizing) to have her own needs met. A second individual observation further illustrates a relationship between characteristics of ASD and the observed peer interactions. In this example, immediately following the researcher's directions to begin, a male child with ASD grabbed the box with trains (a preferred activity for him and one of the materials available to the group), covered the box with his head and arms, and waited until his peers began a different activity before opening the box to play. This child had no interactions with his peers during the observation. In part, this may have been a result of a lack of desire to share his interest with his peers (American Psychiatric Association).

Previous research comparing children with ASD to TD children has also shown that there is variability in the peer interactions of TD children as well (Gonzales-Lopez, 1997; Kamps et al., 1992). Again, a single direct observation may not be representative of a child's social competence. One of the few low peer interaction scores, for example, was from a female child grouped with two male peers. In this observation, the males were observed to play aggressively with the materials (e.g., using one of the games to shoot coins at one another). In fact, they were redirected by the researcher twice to *play nicely with the games*. This was the only observation in the entire TD sample where the researcher needed to intervene. Not surprisingly, the female child chose to play with a different game at the end of the table for the majority of the observation time. Her interactions to the peers were mostly used to request they stop taking her materials or to prompt them to play nicely. While her interactions were sparse, they were contextually

appropriate. And, when they were not effective she was able to problem solve (a more complex social skill) and moved away from their activity to play alone. Thus, despite her low observed peer interaction score, a closer look at the observation is illustrative of a socially skilled child.

On the other hand, for a number of the children with ASD, peer interaction scores did fall within one standard deviation of the peer interaction scores for the TD group. Whether or not those interactions resulted in successful social interactions was not explored. Indeed, many children with ASD now receive early and intensive behavioral services as well as educational services that target social interaction outcomes. As a result of receiving these services, these children many of these interactions may have led to meaningful and age-appropriate interactions.

To what extent are social interaction skills often taught in social skills groups (e.g., asking, sharing, commenting, play organization) observed in the play of typically developing children at the end of first grade? How does this compare to children with ASD?

Seven different social skills: commenting, asking and sharing, play organization, nonverbal communication, helping, social niceties, and turn taking were measured during the play observations. It was hypothesized that this set of social skills were likely to be observed in the play of the TD children, and to a lesser extent the play of the children with ASD. As in the previous question, the TD group was expected to use this set of social skills more frequently than the children with ASD. For the most part, the results supported this hypothesis. Five of the seven skills were observed less frequently in the peer interactions of children with ASD. This finding was consistent with findings from

an earlier assessment of four social-communications skills, where children with ASD were observed to use 40% to 57% fewer of each observed social skill when compared to their classroom peers (Murdock, Cost, & Tieso, 2007). Examples of these skills included commenting, asking questions, nonverbal communication, and requesting.

On the other hand, this study found that peer interactions using turn taking language as well as nonverbal responses were observed more frequently in the peer interactions of children with ASD, and several skills: helping, social niceties, and turn taking were rarely observed in the peer interactions of children in either group.

More than any other skill, children commented to their peers during play. It is interesting to note that only one of the school-based SST group interventions (Kamps, et al., 2002) and one clinic-based group (Barry et al., 2003) explicitly taught this skill to children with ASD. This is surprising, considering that the majority of interactions for both TD children and children with ASD were largely comments, and comments have also been identified as one of the social skills most likely to evoke a social response from a partner (Ferrell, as cited in Goldstein, Kacqmarek, Pennington, & Shafer, 1992).

It is a possibility that the direct observation of comments in this study, however, is inflated. This study selected a small range of games for children to use during play. Of these games, the two most preferred games were Ned's Head and Guess What I Am. In Ned's Head, children reach into an inflated head and pull an unusual object (e.g., a dirty diaper) from the head in an attempt to match their card. In Guess What I Am, children place a cardboard cutout of a person or animal (e.g., a doctor or lion) over their face and their peers give them clues to guess the character. Thus, both games provided many opportunities to comment. Anecdotally, these games were also observed to be novel to

many of the children, which, again, is another factor, which could have influenced the high number of comments made. A different subset of games may have resulted in the use of different social skills.

The finding that helping, social niceties, and turn taking were rarely used during play was surprising, given that helping and turn taking were taught in all of the school-based SST groups from the evidence base, and social niceties were taught in one of the studies as well (Kamps et al., 1992). Of course, there could be several explanations for this finding too.

To explain the lack of observed helping skills, it should be restated that the games available for play were both age and developmentally appropriate and all materials were fully assembled. Thus, the absence of helping behaviors may have been because none of the children required assistance. A different set of games and materials could have occasioned more helping behaviors.

Social niceties were never observed in the interactions of children with ASD. “Please” and “thank you” are discrete social niceties, but applying them at the right time requires an ability to take someone else’s perspective, or recognize and understand their emotions: all of which are challenging for children with ASD and may explain why the skill was not observed. On the other hand, social nicety skills were not used frequently by the TD children either. Thus, a second explanation may be that social niceties are not part of the normal developmental peer interactions at this age. Developmentally, by the time children are five years olds are able to offer compliments when something good happens to someone (e.g., a classmate beats them in a game), and they can apologize for

accidents (e.g., stepping on someone's foot)(Coplan & Arbeau, 2006). However, these findings suggest children may not apply these skills during peer interactions at play.

Turn taking was the only social skill used more frequently by children with ASD. Given that the materials used in the study were mostly structured games (e.g., Uno, Memory, Guess What I Am, etc.) and that turn taking was explicitly taught in all but one of the social skills studies reviewed (Barry et al., 2003) it was anticipated that children would use basic turn-taking language, such as “*my turn*” or “*you're next*” during play. However, less than 5% of the TD children used turn taking language to initiate or respond to peers. The children with ASD used turn taking language slightly more often, but on average, no more than once per observation. Does this mean children in first grade no longer take turns during play? No, of course it does not. A closer look at any of the videos shows children take turns not by verbalizing “*my turn*”, but by observing the environment and actions of others. Some groups did establish turn taking order, but once this happened turn taking itself was nuanced. Children waited for the natural end of a peer's turn before beginning his or her own. Or, they picked up materials after another child finished using them. Turn taking in first grade appeared to be a measure more of one's ability to observe the context to identify the appropriate time to take a “turn”. Turn taking in this study, however, was defined as *requesting a turn, directing a peer to take a turn, or finding out who's turn it is*. Thus, data collection only captured behaviors with a verbal acknowledgement of turn taking, which did not appear to be a part of the normal, developmental play in our sample.

Next, it should be noted that the measurement of social skill behaviors could also explain why social niceties, turn taking, and helping behaviors were infrequently

observed. According to the project coding manual, if a verbal and nonverbal social interaction occurred at the same time a verbal social interaction was the one coded. Therefore, even if a child helped a peer open a box while making the comment “*It’s really stuck!*” a comment would have been coded, not a helping skill. As a result, some opportunities where helping, social niceties, and turn taking were present may not have been recorded.

This research question was limited in that it only assessed the use of seven, discrete social skills. While these specific skills provided one framework for describing the social skills used during play, other frameworks would likely identify different, but equally important skills.

These results are further limited due to the largely unreported use of discrete social skills in both TD and children with ASD. Even though all of the articles included in the literature review for this study identified social skills for intervention, none assessed the frequency with which a set of *specific* social skills (e.g., comment, help, etc.) were used in baseline, treatment, or post-intervention conditions. This type of reporting may be especially valuable when evaluating the usefulness of manualized curriculum and appropriate benchmarks for children with ASD. This study took an initial step in identifying the frequency of seven skills with only a small sample of TD children and children with ASD.

What contextual variables are observed in both the social interaction skills of typically developing children and children with an ASD at the end of first grade that may influence how practitioners develop social skills groups?

This study explored the games children played, and engagement with those games; verbal content during interactions, and the use of a child's name as contextual variables that may be useful considerations in developing social skills groups.

Several interesting findings were revealed when investigating the games available to children during observations. As mentioned earlier, children were provided with four different games to play. The majority of children played with at least two games, and some groups played with three or more games during a brief, ten-minute play observation. With more than half of the groups playing with at least two games, 5 minutes may be a more developmentally appropriate expectation for sustained play. Additionally, a variety of games were also selected for this study with differing levels of complexity. Some, like Ned's Head, required only basic commenting and requesting skills for participation. Others, like Uno, required the participant to be able to count, create, and follow patterns. For example, to play Uno a child needs to be able to adjust his or her play based on the actions of other group members. After a peer takes a turn, the child must decide, based on his or her own hand of cards, which card would be best played at that moment in time. Thus, the complexity of the game may have contributed to observed social interactions. In fact, previous research has identified a relationship between peer interaction and play materials for TD children and children with ASD (Anderson et al., 2004; Pierce-Jordan & Lifter, 2005). Child preferences may have also influenced observed social interactions in this study. To encourage participation, research staff included at least one game suspected to being of high interest to the child with ASD. Previous investigations of social interaction during play have shown children

with ASD demonstrating higher and more consistent peer interaction when engaged with a preferred game (Morrison, Kamps, Garcia, & Parker, 2001).

Both the social exchanges of TD children and children with ASD were largely game related. Children were observed to talk about what was happening in front of them, and occasionally included some content that was not directly about, but still related to the game. For example, in one observation of a group of TD children, several exchanges about dreidels were made after a child commented that the dice in Guess What I Am looked like a dreidel from his home. Related comments such as this were brief and only observed in a few of the play groups for both TD children and children with ASD. This finding was especially of interest, considering many interventions for young children with ASD focus on conversation skills. In the presence of games, it does not appear that TD children at the end of first grade are engaging in decontextualized conversation. This finding may be different in other settings, such as the school cafeteria or while playing at a local park, but decontextualized conversation did not appear to be a skill children in first grade used to interact with their peers while playing games.

As a final contextual variable, this study assessed the extent to which children used one another's names during play. Overall, the names of TD children were seldom used during any play observation, though when the name of a TD child was used during an interval, that child was observed to initiate, or respond to a peer 100% of the time. On the other hand, a TD child was observed to interact with peers (96% of intervals) whether or not his or her name was used. Thus, using a TD peer's name to get his or her attention appeared to be a successful strategy to use, though it may not have been needed often since these children initiated and responded consistently throughout play observations.

On the other hand, for the ASD group, a child's name was used considerably more frequently. In only slightly more than half of all opportunities where a child with ASD's name was used, however, did the child interact with a peer. Thus, using a child with ASD's name did not appear to lead to a verbal contribution from him or her in our sample data. There could be several possible explanations for this as well. The first is, that name use might not have been used as an attention gaining strategy when a peer communicated with a child from the ASD group. For instance, the child's name may have been used as a way to request the child with ASD stop engaging in a certain behavior (e.g., Joey, *no!*). It is quite likely that using a child with ASD's name to gain his or her attention is a valuable strategy for peers, but that those peers who participated in the play groups with children with ASD lacked training to know how to use it. Specifically, untrained peers may not have persisted, or used multiple strategies (e.g., a nonverbal cue such as a tap on the shoulder) if the child with ASD did not respond the first time their name was used.

In sum, this question provided a small scope of several contextual variables that may influence instructional planning or teaching strategies for young, school-aged children with ASD. It is limited in that it only investigated several of many possible factors related to group interactions.

Implications

This study provided a description of the peer interactions observed in children with ASD and TD children in first grade. Observations of this nature are a critical step in identifying the most pivotal skills to teach and designing interventions that sustain in natural environments (McGee et al., 1997). The way TD children interact with one another provides important data to be considered in this process.

TD children use a combination of discrete and complex social skills in their interactions with peers. Thus, it may be worthwhile to concurrently teach, and measure, both discrete and complex social skills to children with ASD as well. If children are learning discrete skills in training groups, but have no opportunity to learn the related, and complex skills that will facilitate appropriate and meaningful interactions in the natural environment, then any intervention is unlikely to truly improve social competence.

Setting appropriate benchmarks for performance is also important. According to McGee (1997) performance goals within the normal range of skill use for TD children might support improved maintenance and generalization. Further, including TD children could avoid unnecessarily teaching skills to artificially high levels, or assuming the default of “80-100% mastery” will support continued use in the natural environment. It will be important for future studies to compare how the normal range of skills vary between groups of TD children, thus investigating the differences between local groups of children. For example, Jahr and his colleagues (2007) identified latency to engage in peer interaction for TD children in kindergarten in order to set appropriate benchmarks for children with ASD. At this point, few studies have quantified normative frequencies of observable social skills for young children. This study attempted to provide this information for children at the end of first grade, though additional skill-specific assessments would provide necessary and valuable information in establishing age-appropriate social skill interventions.

When selecting skills for instruction, comparisons between studies will be essential in understanding if positive outcomes can be replicated. Therefore, social skills targeted in

SST groups should be operationalized and thoroughly described in the study design. Without these definitions, there is no way to compare treatments and really begin to draw comparisons between the most successful curriculums and most pivotal skills to teach children with ASD.

The individual examples mentioned in this study, where children with ASD engaged in high levels of peer interactions provided evidence that we should cautiously interpret frequency as a sole measure of peer interaction. Likewise, when practitioners are using SST groups to provide instruction and translate student needs into measurable goals, the extent to which the child appropriately uses the skill and obtain a successful outcome will provide much more valuable data than frequency alone.

Manualized curriculum or protocols may prove to be valuable in creating replicable SST group interventions. However, several considerations should be made in their development. In the existing evidence base for young, school aged children, the majority of studies of SST groups did follow, or adapt, skills from a manualized curriculum. In the majority of these studies, each curriculum or protocol allocated approximately one to two weeks to teach a target skill. However, a rigid implementation may not be sufficient to produce sustained behavior change in natural environments. For example, while many of the studies targeted play organizing skills as part of the intervention content, play organizing was infrequently observed in the peer interactions for children with ASD in this study. Considering this finding, it may be more beneficial for SST groups to monitor how often, and how well children are using a skill before moving to a different unit of study. A single study from the evidence base did follow a manualized program that also utilized embedded supports to individualize instruction (Stitcher et al., 2012), and

improvements in social competence ratings were reported. Further, other group-based interventions addressing academic skills, such as direct instruction, have a strong history of systematically addressing individual need within a group structure. Thus, this type of differentiation could be feasible in designing SST curriculum as well.

Finally, it may also be important to consider the possibility that there may not be a prescribed set of components that, when assembled and delivered according to a protocol produce consistent, positive changes in social interaction for children with ASD. The contextual factors that will inevitably change from child to child may play a very important part of the development of a SST group. In fact, it has also been previously noted the creation of peer-inclusive social groups for children with ASD may not be an exact science (Goldstein & Thiemann-Bourque, 2012). Rather, capitalizing on common interests may increase social interaction and develop peer relationships. Considering this perspective, choosing materials that may increase motivation, or selecting preferred peers as members in the group could prove to be very important. In fact, one of the studies reviewed in the literature for this study (Owens et al., 2008) used LEGO-based project groups as a context to facilitate peer interactions. There are a number of studies using LEGO Therapy to improve peer interactions with children with ASD. This intervention provides embedded opportunities to practice social interactions within an activity that is preferred by many children with ASD. Thus, further investigation on instructional delivery and secondary teaching strategies (e.g., prompting, reinforcement, etc.) are also warranted.

Conclusions

In sum, there is still a great deal to be learned about improving social interactions for children with ASD. Peer interactions are one of the many indicators of social behavior, and one of the most highly used measures of social competence in early childhood (Odom et al., 1992). The results of this study provide support that direct observation can be a valuable tool in understanding the differences between the peer interactions of TD children and children with ASD. On direct observation measures of peer initiations, responses, and combined interaction behaviors, the TD children consistently interacted with peers more frequently than the children with ASD. However, the presence and absence of skills alone cannot provide sufficient information in understanding what skills children need to be socially competent. The skills most pivotal to improved social competence remain largely unexplored. Unlike many previous studies, the present study contributed to the research on SST groups by operationalizing the social skills assessed, and comparing their use against the behaviors of typically developing children. Future studies should continue to assess the efficacy of the many setting and curricular factors in SST groups, and continue to include comparisons to TD children. Additional descriptive information can help facilitate replications of successful interventions, and improve social competence for children with ASD.

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Appendix A

Child/Video ID: _____ Focus child gender: _____
 Video date: ____/____/____ Dissertation Assessment Date: ____/____/____

Materials available: _____

	Games/Materials	Interactions	Content	Verbal Participation	Activity Engagement	Name	Position	Background	Seating	Room	Gender	Notes
Begin 0:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1	0 1	1 2 3 4 5 6	0 1 2	
1:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
2:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
3:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
4:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
5:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
6:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
7:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
8:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				
End 9:00			0 1 2	0 1 2	0 1 2 3	0 1	0 1	0 1				

Child Behaviors

Interactions: tally frequency of focus verbal initiations/responses
Content: 0 - off topic/perseverative, 1 - game based, 2 - other topic
Verbal Participation: 0 - no peers, 1 - 1 peer, 2 - both peers
Activity Engagement: 0 - focus disengaged from activity, 1 - peers 2 - focus + 1 peer, 3 - focus + both peers
Name: 0 - focus name not used; 1 - focus name used during interval

Contextual Variables

Games/Materials: name of game(s) used during interval
Position: 0 - end; 1 - middle
Background: 0 - low/no distractions or 1 - high distractions
Seating: 0 - kid seat/table; 1 - adult seat/table
Room: 1 - Small Instructional Room; 2- Special Education Classroom; 3 - General Education Classroom; 4 - Conference Room; 5 - Hallway; 6 - Other (describe)
Gender: 0 - same gender, whole group, 1 - peers opposite gender from focus, 2 - dif gender each peer

Appendix B

Coding Manual

General Description of Coding Worksheet

The worksheet is designed to capture data from a ten-minute play observation. There are ten intervals in all, and each represents a 60-second interval of the observation. While some data can be captured during the minute, at the end of each minute, the video is paused and all observational categories are coded and reviewed.

For minute one, a total of eleven observational categories are recorded. For minutes two through ten, eight categories are recorded.

A “notes” section has been developed to allow the recorder to write in student initiations or responses during the interval. The recorder is to write five or more initiations or responses for each video reviewed.

A worksheet is completed for a single child in the observation group (otherwise known as the “focus” child).

Games/Materials

1. When the interval begins, record the game(s) or materials in play. “In play” means one or more children are physically handling the item(s).
2. During the interval, continue to add any additional game(s) or materials which enter into play.

Interactions

Measure frequency of the focus child verbally initiating and/or responding to a child(ren) in the group. During each one-minute interval, any initiation or response is coded with a single hash.

If a child initiates/responds to an adult, no data is recorded.

If a child initiates/responds within 3 seconds of a previous initiation/response, then it is recorded as a single occurrence.

Content

One or more codes can be applied to each interval.

- **0 – Off topic/perseverative:** Focus child repeats the same initiation/response 3 or more times
- **1 - Game based:** Initiations/responses are about the game/materials in play. Examples would include play organizers (e.g., “Let’s play Ned’s Head”), asking

- questions (e.g., “Can I have the card?”), turn taking statements (e.g., “It’s my turn”), and commenting about the activity/materials (e.g., “Ew, a dirty diaper!).
- **2 – Other topic:** Conversations are situated outside of the present activity. For example, children talking about what they will do at recess that day, other games they like to play, etc.

Verbal Participation

- **0 – No peers:** During the interval, no verbal initiations/responses of peers occur.
- **1 – 1 peer:** During the interval, one peer verbally initiates/responds to any group member.
- **2 – 2+ peers:** During the interval, two or more peers verbally initiate/respond to any other group member(s).

Activity Engagement

This is a measure of materials engagement. This category represents the extent to which children are interacting with the games/materials provided to them.

- **0 – Focus is disengaged from the game/materials “in play”.** A child can be engaged in the activity without verbal participation. This would be the case if a child, for example, is “leaning in” to the group, physically taking turns, etc. A disengaged child is not facing the group, interacting with the game/materials, etc.
- **1 – Peers.** 1 peer is engaged in the game/materials “in play”.
- **2 – Focus + 1 peer.** The focus child and 1 peer are engaged in the game/materials “in play”.
- **3 – Focus + 2 peers.** The focus child and 2 peers are engaged in the game/materials “in play”.
- **4 – Focus + 3 peers.** The focus child and 3 peers are engaged in the game/materials “in play”.

Position

Three or four children participate in each video observation.

- **Groups of 3.** The single participant with a child on either side is coded 1 – middle. The other children are coded 0 – end.
- **Groups of 4.** The two children with a child on either side would each be coded 1 – middle. The two children at the outside of the table are coded as 0 – end.

Background

- **1 - Low/no distractions.** Either a.) the location of the play observation is quiet and free of auditory distractions, or b.) the location may have some level of auditory distraction, however the participants do not acknowledge the distractions (e.g., no participants look away from the action, or engage with other children outside of the group).

- **2- high distractions.** Participants physically look/turn toward auditory noise outside of the group (either environmental or from individuals). Participants verbally engage with other children outside of the group.

Gender

Record gender of each group member.

- 0 – All peers in the group are the same gender (e.g., all girls).
- 1 – Peers are the opposite gender of the focus (e.g., focus child is a girl, and peer participants are boys).
- 2 – Peer participants include at least 1 boy and 1 girl.

Seating

- 0 – kid seat/table. Children are seated at tables and in chairs appropriate for their size. Chairs are standard school chairs (no wheels).
- 1 – adult seat/table. Children are seated in conference room, office, or other adult sized chairs and tables.

Room

Record the type of room used during the play observation.

- 1- Small instructional room. Example: small group learning support room, breakout room
- 2 – Special education classroom.
- 3 – General education classroom.
- 4 – Conference room.
- 5 – Hallway.
- 6 – Other. Example: outdoor classroom, playground, computer lab, etc.