HELPING YOUTH WITH AUTISM SPECTRUM DISORDER DEVELOP SOCIAL COMPETENCE IN COMMUNITY-BASED SETTINGS

by

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ABSTRACT

The purpose of the current dissertation is to identify the features of effective interventions by exploring the experiences of youth with ASD who participate in such interventions, through two intervention studies (Studies 1 and 2) and one interview study (Study 3).

Studies 1 and 2 were designed to support the development of social competence of youth with ASD through Structured Play with LEGO™ (Study 1, 12 youths with ASD, ages 7–12) and Minecraft™ (Study 2, 4 youths with ASD, ages 11–13). Over the course of the sessions, the play of the youth developed from parallel play (children playing alone, without interacting) to co-operative play (playing together with shared objectives). The results of Study 2 showed that rates of initiations and levels of engagement increased from the first session to the final session.

In Study 3, 12 youths with ASD (ages 10–14) and at least one of their parents were interviewed to explore what children and their parents want from programs designed to improve social competence, which activities and practices were perceived to promote social competence by the participants, and which factors affected their decisions regarding these programs. The adolescents and parents looked for programs that supported social development and emotional wellbeing, but did not always have access to the programs they would have preferred, with factors such as cost and location reducing their options.

Three overarching themes emerged through analysis of the three studies: (a) interests of the youth; (b) structure, both through interactions and instruction; and (c) naturalistic settings. Adolescents generally engage more willingly in interventions that incorporate their interests, such as play with Minecraft™ in Study 2. Additionally, Structured Play and
structured instruction were crucial components of providing safe and supportive contexts for the development of social competence. Finally, skills learned in naturalistic settings tend to be applied more successfully in everyday situations. The themes are analysed through the lens of Vygotsky’s (1978) perspectives on learning, play, and development. Implications of the results for practitioners and researchers are discussed.
CO-AUTHORSHIP

Study 1 was co-authored with Ian Matheson and Dr. Nancy Hutchinson.
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STATEMENT OF ORIGINALITY

I hereby certify that all of the work described within this thesis is the original work of the author. Any published (or unpublished) ideas and/or techniques from the work of others are fully acknowledged in accordance with the standard referencing practices.

(Jeffrey William Harris MacCormack)

(May, 2016)
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LIST OF ABBREVIATIONS

ABA – Applied Behaviour Analysis

APA – American Psychological Association

ASD – autism spectrum disorder

IBI – Intensive Behavioural Intervention

SRS-2 – Social Responsiveness Scale, Version 2
CHAPTER 1: INTRODUCTION

Sometimes I play with zero people…I go and scream into my pillow a thousand, thousand times or I go outside and run around and scream. (Youth, Study 3)

Over the course of the current dissertation, I spoke with many young people with autism spectrum disorder (ASD) and their parents, but screaming into a pillow a thousand, thousand times may be one of the best articulations of the frustration of social exclusion that I heard. Like the youth quoted, the parents of youth with ASD were also deeply concerned about their children’s social success. What did these parents want for their children? As described by a mother in Study 2, parents perceived that their children’s social competence and lifelong trajectories were foundationally connected:

All I want is for my child to be happy. I can’t help but compare with my nephew and how he started off similarly…My nephew graduated high school last year and he sits around and plays video games. He doesn’t have any social interaction and that’s my nightmare. I want something more for him. [My son] doesn’t have to turn into a social butterfly or play on the team or run the council, but he has to have some friends he can spend time with…I’m working on that, but…all I want for [my son] is to be in the world and be happy. (Mother, Study 2)

Purpose

The purpose of this dissertation is to identify the features of effective social competence interventions for youth with ASD by exploring the experiences of youth with ASD who participate in such interventions. The current dissertation incorporates two strategies that focus on this purpose. The first strategy is to design, and evaluate the
effectiveness of, social skills interventions within naturalistic, community-based settings that incorporate interests into play-based activities for youth ages 7–13. In Study 1, I evaluated the effectiveness of a pre-existing program, without contributing to the design of the intervention. In Study 2, I designed and evaluated the intervention and program. The second strategy (Study 3) is to learn which program features are perceived by youth with ASD and their parents to promote social competence.

Definitions

The five key terms used in these current studies are: autism spectrum disorder, social competence, initiation, social engagement, and interests.

Autism spectrum disorder (ASD) is a developmental disorder characterized by persistent deficits of social communication, such as reduced social-emotional reciprocity and poorly integrated nonverbal language, and restricted, repetitive patterns of interests (American Psychological Association [APA], 2013).

Social competence is a multi-layered construct that describes the capacity of an individual to meaningfully interact with others, incorporating cognitive, emotional, and behavioural abilities. Social competence is difficult to measure objectively and is often quantified as the culmination of observable social skills and perceived social success (Nangle, Erdley, Adrian, & Fales, 2010). Increased social competence has been measured as number of initiations (LeGoff, 2004) and level of social engagement (Koegel, Kuriakose, Singh, & Koegel, 2012).

Initiations refers to spontaneous, non-mediated originations of a social interaction, such as opening new topics of discussion (verbal) or approaching and facing another person (nonverbal). An initiation is not a continuation of a previous sequence (Bauminger,
Shulman, & Agam, 2003). Rates of initiations represent an imperfect measure of social competence because they do not encompass the full scope of improvements in social interactions (Conn, 2014). Despite the weakness of the measure, initiations are often used as a proxy for social competence because rates of initiations tend to only increase when social improvements are made across multiple subcategories (e.g., social motivation, social communication, Social Responsiveness Scale Version 2 [SRS-2], Constantino & Gruber, 2012).

*Social engagement* refers to observable use of appropriate behaviour in social contexts. Appropriate behaviour is specific to the context but, in general, youth are considered to be socially engaged when they make eye contact, smile at others, and share objects (Koegel, Matos-Freden, et al., 2012). Social engagement is generally considered to be disrupted when youth tease others and use verbal aggressiveness (Bauminger et al., 2003).

*Interests* are attentions focused on an object, activity, or topic (Dunst et al., 2012). In the literature, the construct of interest describes objects, activities, and topics that are of personal or situational interest to the youth with ASD. Researchers commonly use interviews or surveys to learn the interests of participants (e.g., Baron-Cohen & Wheelwright, 1999); taxonomies of common interests of people with ASD have also been used as a proxy for personalized surveys (e.g., Sasson & Touchstone, 2014). Previously, topics of interest were avoided in the design of interventions because intense interests were considered to be a deficit (Lewis & Bodfish, 1998; Szatmari et al., 2009). More recently, the incorporation of interests has been recognized as crucial for the success of interventions of youth with ASD and their increased wellbeing (Campbell & Tincani, 2011; Dunst et al., 2012).
Researcher Positionality

My interest in supporting the developmental needs of children with ASD began when I started working as a classroom teacher. As I became comfortable in my role, it became more important to me that every student felt safe and had equal opportunity to learn. I was also influenced by my daughter Lily who has ASD. As she moved through the grades, I started to see the failures of the school to support her needs. In my dual role as a parent and educator, I worked closely with her classroom teachers to find strategies to support her learning.

After seven years of teaching in general education classrooms, I started teaching in a specialized classroom designed for youth with ASD. Unlike most of the students in general education classrooms, the students in the specialized classroom were non- or partially verbal and required extensive supports to communicate. The most challenging part of the classroom was motivating the students to learn. When I went to the school board for help, the resource teachers recommended that I introduce external reinforcements, which is in line with the Ministry of Education’s adoption of Applied Behaviour Analysis (Ontario Ministry of Education, 2007). External reinforcements like token economies and edible rewards were not effective for very long, so I started to look at different forms of motivation.

Even though many of my students were non-verbal, they were very interested in screen technology such as iPads, SMART Boards, and computers. To incorporate screen technology into the programs of the students in my classroom, we raised money in the school and mounted a SMART Board, which we used for calendar time and daily physical activity. I also advocated at the school board for funding for iPads. I was granted enough money to purchase iPads and apps for every student and iPods for the Educational
Assistants. As part of a comprehensive communication and social skills program, we used apps such as Proloquo2Go™ and First Then™ to help the students share their ideas, preferences, and feelings. As a result, the students initiated communication more often and responded appropriately to others. Based on these results, my classroom became a model for iPad programs and technology integration.

In contrast to the successes occurring in the classroom, my daughter Lily was having a hard time in her classrooms. Her school experience was so frustrating that we started to look at community-based programs to support her learning. Lily tried a variety of community-based programs but found that many programs were unstructured and poorly suited to support her needs. Around that time, I left my job as an educator and started my Ph.D. As a father and an educator, I had many questions about how programs work to support the development of youth with ASD. This dissertation represents my attempt to answer these questions.

**Literature Review**

The social frustration expressed by youth with ASD and the anxiety of their parents may not come as a surprise. As a diagnostic characteristic of the condition, youth with ASD have difficulty socializing and communicating (APA, 2013). While youth with ASD and their parents are highly motivated to improve the youths’ social competence, finding contexts wherein youth can improve their social competence is difficult. Unlike skills that can be learned and practiced in isolation, youth with ASD can only improve their social capacity through purposeful social exchanges with others in appropriate contexts (Bauminger-Zviely, 2013; Conn, 2014). Not only must youth with ASD develop new social skills, they must also learn to apply those skills during social interactions. However, the cues
and rules for these interactions may be in constant flux and difficult to predict. Participation in social exchanges requires verbal skills, such as oral and receptive language skills, and nonverbal skills, such as sharing attention, holding eye contact, and understanding different perspectives (Koegel & Koegel, 2012; Lainé, Rauzy, Tardif, & Gepner, 2011). To choose appropriate responses, effective socializers decode the layers of meaning embedded in social exchanges—a task that requires familiarity with other persons, keen awareness of cultural and societal contexts, and possibly specialized skills, such as recognizing sarcastic tones (Gresham, 1981; LeGoff, 2004).

Compared to typically developing youth, decoding layers of social meaning is more difficult for youth with ASD because the manifestations of social deficits of youth with ASD are profound and wide-ranging. Many persons with ASD find it hard to integrate into their social circles and may experience loneliness and isolation (Bauminger et al., 2003). The spiral of frustration and discouragement can compound the problem, because youth with ASD may miss out on opportunities to practice and strengthen their social skills (Bauminger & Kasari, 2000).

Behavioural psychologists developed the first interventions to improve social skills of people with ASD. Using rewards and punishments to help youth with ASD develop skills, behaviourist programs (e.g., Intensive Behaviour Intervention [IBI], Lovaas, 1987) focused on helping individuals with ASD develop social skills, such as making eye contact, sharing attentional gaze, and communicating preferences. In many ways, the behaviourist approach was positive and productive (Lovaas, 1987); however, by their nature, behaviourist strategies are not entirely suited for teaching complex skills such as social competence (Bandura, 1977; Greenspan & Wieder, 1999; Koegel et al., 1998). Social competence is not an isolated
set of social skills; social competence also requires that the skills be performed meaningfully in context. Even when youth have mastered a social skill, they may not perform it (Conn, 2014; Gresham, 1981). To support the performance and fluency of social skills, interventions should recognize that many people with ASD are already participating in social exchanges and can “fine-tune” those skills (Bauminger-Zviely, 2013).

Children and adolescents with ASD may not be motivated to socialize, which can hinder the effectiveness of social skills interventions because, even though youth may have the skills they need, they do not perform them (Barakova, Bairacharya, Willemsen, Lourens, & Huskens, 2014). Instead, youth with ASD may focus on the objects, activities, and topics of interest to them personally, while ignoring opportunities to socialize (Kanner, 1943). Program designers and interventionists have tried to use incentives to motivate young people with ASD and tended to avoid topics of intense interests to young people with ASD, which are diagnostic characteristics (e.g., Lovaas, 1987). However, the interests of individuals with ASD do not reduce learning, as once believed, but are strengths that can be used to support the development of skills (e.g., Barakova et al., 2014; Boyd, Conroy, Mancil, Nakao, & Alter, 2007), such as social skills (e.g., Jull & Mirenda, 2010), academic skills (e.g., Koegel, Singh, & Koegel, 2010), and communication skills (e.g., Campbell & Tincani, 2011). Indeed, in his systematic review of intervention approaches for youth with ASD, McConnell (2002) recommended that interventions include interests and play-based activities to maximize the level of engagement. Programs that incorporate interests have tended to be more effective at helping youth develop social competence outcomes than have programs that do not incorporate interests (Dunst, Trivette, & Masiello, 2012). When interests are used
to increase motivation, individuals with ASD often seek educational situations instead of avoiding them (Koegel, Bradshaw, Ashbaugh, & Koegel, 2013).

Play-based activities are well suited for social skills interventions because the structure of the game play can easily incorporate the youths’ interests and can be designed to mimic social rules (e.g., Baker, Koegel, & Koegel, 1998; Wainer, Ferrari, Dautenhahn, & Robins, 2010). Play-based activities used to facilitate social skills programs have incorporated traditional activities, such as construction (LeGoff, 2004), outdoor recess games (Baker, Koegel, & Koegel, 1998), and musical interactions (Elefant & Wigram, 2005). LeGoff (2004) embedded the interests (i.e., LEGO™ building blocks) of the participants in his study by developing a play-based activity.

Interventions designed to improve social competence are most effective when they use natural settings (McConnell, 2002). The value of natural settings for learning has been noted by educators (Dewey, 1913) and psychologists (Vygotsky, 1978) for many years. Learning in everyday settings with meaningful circumstances is particularly important for communication and social development (Baker, Koegel, & Koegel, 1998; Dunst et al., 2012; Koegel, Kuriakose, et al., 2012). Substantial research has, therefore, been focused on increasing the rate of skill transfer to the settings and contexts where youth need skills to socialize, such as school, home, and community. When interventions are designed for school, home, and community settings, youth with ASD are better able to transfer skills because they have developed and practiced skills with appropriate peers in settings where they would naturally socialize (Koegel, Matos-Freden, et al., 2012). Studying community-based interventions is important because, even though these programs are popular choices for youth with ASD (Stadnick, Stahmer, & Brookeman-Frazee, 2015), little empirical
evidence informs the development of the programs or their evaluation in this natural setting (Drahota, Aarons, & Stahmer, 2012; Ratcliffe, Wong, Dossetor, & Hayes, 2014).

Considering how important factors of motivation and setting are for the effectiveness of the development of social competence, research is needed to explore the characteristics of meaningful contexts for social development of youth with ASD. While it is broadly accepted that learning can be rich in meaningful contexts (e.g., Deci & Ryan, 2000; Koegel & Koegel, 2012), less is known about what types of contexts foster social development for youth with ASD and what types of interactions in those contexts best support the development and performance of social competence.

Description of Studies

The three studies in the current dissertation (two intervention studies and an interview study) build on one another and collectively inform the research purpose, through the use of observations (Studies 1 and 2), behaviour coding (Study 2), and interviews (all studies).

Study 1

During Study 1, 12 youth with ASD (ages 7–12) played with LEGO™ in Structured and Unstructured Play with five age-appropriate siblings without ASD and four adults. During Structured Play, youth interacted in groups using roles designed for the intervention (LeGoff, 2004) over four sessions of 60 minutes. In each group, two youth with ASD, one typically developing peer, and a staff member chose a building project from the available toy kits (e.g., build a jeep, build a cabin). The youth with ASD received direct and indirect instruction from peers and staff members. Through direct observation and interviews, results from Study 1 described the salient components of a community-based program developed
based on clinical research by LeGoff (2004). This study has already been published in
*Exceptionality Education International* (MacCormack, Matheson, & Hutchinson, 2015).

**Study 2**

Based on the findings of Study 1, the intervention in Study 2 was developed to include best practices (e.g., direct instruction, modelled learning, Structured Play) in the creation of a meaningful context for social development. Four youth with ASD, ages 11–13, participated in play with the videogame Minecraft™ during eight one-hour sessions. During Structured Play, the youth took on roles (Architect, Artist, Foreman) in small groups to complete team objectives and received support from video modelling, adult facilitation, and peer mediation. During Free Play, the youth were allowed to play the videogame without structured requirements and to do so alone or with others.

**Study 3**

The findings of Studies 1 and 2 informed the development and implementation of Study 3. During Study 3, I conducted interviews with 12 youths with ASD (ages 10–14) and at least one of their parents to establish the learning profile of the youth, perceptions of the programs and interventions in which the youth had participated, and the preferred leisure activities of the youth. Study 3 was designed to explore what goals youth with ASD and their parents sought to accomplish through participation in programs designed to improve social competence, which activities and practices were perceived to be effective, and which factors affected the decisions of parents of youth with ASD regarding social competence programs.

**Theoretical Framework**

Even though Vygotsky’s writings predated the identification of ASD by Kanner (1943) by many years, Vygotsky’s perspectives contribute substantively to the care and
instruction of youth with ASD and, by extension, to the current dissertation. Central to this discussion of Vygotsky’s work and its application to the current dissertation are two statements from a lecture Vygotsky delivered at the Leningrad Pedagogical Institute in 1933, and later published in *Mind in Society* (1978), on the interaction between play and development of youth. The first statement, “The influence of play on a child’s development is enormous” (Vygotsky, 1978, p. 96), frames a discussion of development and encapsulates key tenets of Vygotsky’s perspectives. Unwrapping the full implication of the statement requires an investigation into Vygotsky’s broader perspectives on learning and development.

Although Vygotsky’s best known contribution is the application of the zone of proximal development to instruction (Del Rio & Alcarez, 2007), Vygotsky’s (1978) perspective on learning and development went far beyond provisions for instructional methods. Vygotsky considered the relationship between learning and development to be the heartwood of any psychological analysis of teaching. Critical of his contemporaries such as Piaget (1926), who considered learning and development to be separate, and James (1902), who considered learning and development to be congruent, Vygotsky proposed that learning comes before development, especially for school-aged children. According to Vygotsky, children learn in developmental cycles with each cycle beginning with something learned and completing when the learning is internalized (development). Vygotsky called the lag between learning and development the zone of proximal development.

Understanding the zone of proximal development requires a close look at Vygotsky’s perspectives on social learning and imitation. According to Vygotsky (1978), all high-order functions develop through two steps, “first between people (interpsychological), and then inside the child (intrapsychological)” (p. 57). The first step of the developmental cycle is an
initial learning which, according to Vygotsky, occurs only through social interactions. Vygotsky considered social interactions, and speech in particular, to be crucial to problem solving: “Learning awakens a variety of internal development processes that are able to operate only when the child is interacting with people in his environment and in co-operation with his peers” (p. 90). Without social speech, children would not be capable of abstract thinking and would remain as concrete thinkers. The second step in the development cycle is the internalization of the learning. Vygotsky believed what a child can accomplish with the help of someone else will soon become independent skills. Although being able to mimic is not traditionally considered evidence of knowledge, Vygotsky believed that what a child can do with the support of others should be considered as part of the child’s knowledge because, through imitation, the child practices and solidifies learning. In his words, “Once these processes are internalized, they become part of the child’s independent developmental achievement” (p. 90).

While it is not clear how much Vygotsky (1978) envisioned the application of zone of proximal development to instructional methods, his perspectives have been applied to learning settings in a variety of ways. Based on the work of Vygotsky, integrated play groups have been used to improve social play by connecting expert players (typically developing youth) with novice players (youth with ASD) in natural settings (Wolfberg & Schuler, 1993). The concept of guided participation (Rogoff et al., 1993) is also based on Vygotsky’s perspectives and includes a process of dynamic development through co-operative activities. An oft-cited study of the zone of proximal development, the work of Palinscar and Brown (1984) on reciprocal teaching showed how socially shared activities could be transformed into internalized processes. In the classroom, concepts of gradual
release of responsibility (Pearson & Gallagher, 1983) and scaffolding (Hammond & Gibbons, 2005) are commonly described as Vygotskian in origin but, as noted by Daniels (2007), often have little to do with the processes of intrapsychological development as described by Vygotsky.

Returning to the concept of play, Vygotsky’s (1978) thoughts on play have not gained as much attention in educational settings as his thoughts on the zone of proximal development, so it may not be widely known that he considered play to be vital to development. Children are able in play to ignore the rules that regularly govern their interactions. While pretending to be a dragon, for example, the child can ignore the fact that he or she is a human. In their virtual play space in Study 2, for example, the boys were able to fly, build enormous structures, turn magma into rock with water, and grow cows from eggs, even though these tasks would be impossible for them in real life. In play, a stick is not simply a stick; a child’s conceptual understanding of the world is expanded so that a stick can be a horse or a sword. Vygotsky’s conceptions of play differ from play in the current dissertation because he was referring to pretend play and imaginative play, common with young children. Structured Play, as conceptualized in the current dissertation, is play embedded with social interactions as necessary components of participation. Despite these differences, his views of development of play are still relevant. The value of play, according to Vygotsky, is that children ignore their own inclinations and capacities and engage in play appropriate to the rules of the game. When children learn to play, they learn to ignore their own desires and submit themselves to the structure of the game. There is no such thing as play without rules, he wrote, and “the more rigid they are the greater the demands on the child’s application, the greater the regulation of the child’s activity, the more tense and acute
play becomes” (Vygotsky, p. 103). Through abstract problem solving and co-operation with peers, participation in Structured Play creates a context where children can push the limits of their capacities, internalize their learning, and make crucial gains in development.

The second statement from Vygotsky’s lecture at the Leningrad Pedagogical Institute that frames the current dissertation describes this perspective on play as crucial to development:

Play creates a zone of proximal development of the child. In play, a child always behaves beyond his average age, above his daily behaviour; in play it is as though he were a head taller than himself. As in the focus of a magnifying glass, play contains all developmental tendencies in a condensed form and is itself a major source of development. (Vygotsky, 1978, p. 102)

The perspective of play represented in the statement, as underpinned by Vygotsky’s description of social learning and development, is integral to the current dissertation. Its profound implications for the current body of work, particularly the results of Study 2, are expanded in the final chapter.

The three studies in the current dissertation (Chapters 2, 3, and 4) are well served by a theoretical framework based on Vygotsky’s (1978) perspectives. The two intervention studies (Studies 1 and 2) were designed to explore the play contexts and interactions involved with guided instruction of social skills. The support provided in Studies 1 and 2 by adult volunteers, typically developing peers, and the play structure constitute expressions of the youths’ zone of proximal development, whereby the participant youth with ASD translated interpsychological learning into intrapsychological development. With respect to the interview study (Study 3), youth with ASD and their parents contributed to the
discussion of zone of proximal development by describing programs and activities that were considered to be effective, thereby identifying the program components that best provide opportunities for learning and development of social skills.

According to Vygotsky (1978), those who look to explore the zones of proximal development should know that the zones vary widely among individuals and subject matter. Untangling the dynamic and complex relationships between youth and development goals within various fields of study requires, according to Vygotsky, “extensive and highly diverse concrete research based on the concept of the zone of proximal development” (p. 91). The current dissertation may contribute to the larger goal of resolving some of the complexities surrounding the concept of the zone of proximal development and its application to the development of social competence in youth with ASD, by demonstrating how young people internalize learning through practice, interaction, and play. The final chapter of this dissertation (Chapter 5), therefore, synthesizes the results across the three studies, by comparing their overarching themes and analyzing those themes through the most recent research literature on young people with ASD and the concepts emanating from Vygotsky’s (1978) work. The dissertation concludes with a discussion of implications for research and practice.
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CHAPTER 2: AN EXPLORATION OF A COMMUNITY-BASED LEGO® SOCIAL-SKILLS PROGRAM FOR YOUTH WITH AUTISM SPECTRUM DISORDER

It is 6:45 on a Wednesday evening in a mid-sized city in Ontario. Clustered on the floor of a large community hall, a group of 17 youths (mostly boys) and several young adults are sprawled out or seated on foam mats. In groups that include three youths and one young adult, the participants form circles around a pile of building blocks, a descriptive manual, and a half-constructed project. The youths are deep in concentration as they lean in closely. The youths talk casually, laugh occasionally, and when disagreements break out, order is restored through calm tones. As one youth shifts position, another unconsciously mirrors the body language of the first. One might not suspect from seeing these youth take turns, negotiate roles, and collaborate that most of them are here because they have difficulty socializing. Most of the youths have autism spectrum disorder (ASD) and usually have difficulty co-operating with peers.

Introduction

One of the diagnostic characteristics of ASD is the impairment of social skills (American Psychiatric Association, 2013). Social-skill impairments can manifest in a number of ways and are often unique to the individual. Youth with ASD may experience difficulty imitating others’ gestures and faces (Lainé, Rauzy, Tardif, & Gepner, 2011), inferring mental states of others (Baron-Cohen, Joliffe, Mortimore, & Robertson, 1997), and orienting focus to a shared object (Pruett et al., 2011). They may play less effectively than typically developing peers (Anderson, Moore, Godfrey, & Fletcher-Flinn, 2004) because they often find initiating and responding to social bids challenging (Murdock & Hobbs,
2011). They are generally less able to participate meaningfully in complex imaginative games, an inability that may limit the attention they receive from peers (Jordan, 2003).

Delays in developing social skills not only reduce the motivation for and enjoyment of interpersonal interactions but can also have long-term consequences. Early disruption of social-skill development can reduce the cognitive development of youth, making them less able to attend to caregivers’ referential gestures, which can limit the effectiveness of direct instruction (Pruett et al., 2011). Due to these social delays, youth with ASD may experience deep anxiety and emotional stress (Abell & Hare, 2005). The majority of youth with ASD live on the periphery of their social circles (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011), live in loneliness (Bauminger, Shulman, & Agam, 2003), and experience profound social isolation (Bauminger, 2002). The spiral of social exclusion means that, because youth with ASD have fewer opportunities to develop and practise social skills, their chances for success are further reduced (Bauminger, 2002).

Although clinical interventions have been shown to improve the rates of social-skill development (e.g., LeGoff, 2004), parents of youth with ASD frequently turn to community-based programs for social-skill development (Allen & Barber, 2015; Carter et al., 2004). Community-based programs provide cost-effective alternatives to clinical interventions, which often require considerable time commitments (intensive programming requires more than 30 hours per week, Koegel & Koegel, 2012; non-intensive programming requires at least 30 hours, spread over 10 to 12 weeks, Gresham, Sugai, & Horner, 2001). Unlike clinical interventions, community-based programs take place in naturalistic settings, which can increase the transfer of skills to other contexts (Altman, 1995; Koegel, Kuriakose, Singh, & Koegel, 2012). Though community-based program designers may not always have access
to clinically trained psychologists, they can rely on the findings of research conducted in clinics to inform the design and implementation of their programs (Stadnick, Stahmer, & Brookeman-Frazee, 2015).

Examining community-based programs is important because families of youth with ASD use them. Studying community-based programs can be difficult because—unlike clinical interventions which control variables like setting, attendance, and treatment—these variables are not usually controlled. Youth who participate in community-based programs are not limited to a single series of sessions, do not need to provide diagnosis at registration, and are welcome to attend at their convenience. This means that evaluations of community-based social-skill programs can be plagued with validity threats including ambiguous temporal precedence, repeated testing, maturation, and selection bias (Brewer, 2000). Rather than trying to control the elements of a community-based program, this study adopted a naturalistic, ethnographic approach and used interviews and direct observation to explore how LeGoff’s (2004) clinical model can be applied in a community-based program. This allowed us to explore the salient components of the program as it was run in the community, which we acknowledge resulted in lower internal validity, but also contributed to much higher social validity than a more controlled clinical study.

**Theoretical Framework**

Vygotsky’s (1978) sociocultural theory describes how youth develop through their interactions with the social world. In the present study, we use Vygotsky’s sociocultural theory to explore which components of a community-based social-skills program might be most salient for enhancing social skills of youth with ASD.
According to Vygotsky (1978), people develop beyond their own capacity when they receive external support—a phenomenon Vygotsky termed the *zone of proximal development*. External support, according to Vygotsky, must come from someone who is more skilled in the area of development; he called this person a *more knowledgeable other*. Another important aspect of the sociocultural theory is that learning precedes development. Learning can be understood as exposure to and engagement with new information. Development occurs when new information is given meaning; an individual may learn a new skill, but development occurs when the skill is used in a meaningful context. Analyses using Vygotsky’s *zone of proximal development* to structure social interactions are well established in the literature (e.g., Collet, 2012).

Based on Vygotsky’s (1978) sociocultural theory, the gradual release of responsibility model (Pearson & Gallagher, 1983) describes how learners move along a continuum and progress from receiving explicit instruction, to engaging in guided practice, and eventually to using the skills they learned independently. We use Vygotsky’s sociocultural theory and the gradual release of responsibility model to focus on the development of social skills through the community-based program as an interaction between learners and more knowledgeable others.

**Use of LEGO® for Social-Skill Interventions**

The development of the community-based program, the focus of the current study, was informed by the findings of studies conducted by LeGoff (2004). LeGoff originally developed structured social play after observing two of his clients showing mutual enthusiasm for LEGO® building blocks—the youths were socializing more effectively when
playing than they had socialized in clinical trials. Determined to utilize toy-based play in his clinical intervention, LeGoff created structured play that included the use of LEGO®.

The structure of LeGoff’s therapy includes three roles: the engineer, the builder, and the supplier. The engineer tells the supplier which building block is needed (which the supplier provides) and tells the builder where the block goes (which the builder places). These roles are rotated so that every youth has a chance to participate in all three roles in each session. Completing the building task requires that the youth collaborate, share joint attention, communicate, and solve problems. Youths in LeGoff’s study (2004) demonstrated significant improvements in social-skill development, such as increased frequency and duration of social interactions. Youths who participated in LeGoff’s therapy sessions (90 minutes of group session and 60 minutes of individual session per week, for 24 weeks) improved their social competence; and the improvements were maintained, as established through a follow-up study (LeGoff & Sherman, 2006).

The current study focuses on a community-based intervention designed to increase the social skills of youths with ASD that was modelled after the original LeGoff (2004) structure. For the sake of clarity, we refer to the current social-skill intervention as the Program. In the next section we describe the Program as the staff implemented it.

**Structured-Play Program**

At the beginning of each 60-minute session, the staff (i.e., the Coordinator and young adult volunteers) welcomed the youths. The Coordinator was a community-program designer who had extensive experience working with youths with ASD. The young adult volunteers were university students with varying amounts of experience with ASD.
The Program sessions began with the youths socializing casually until they were called to Circle time. During the Circle time, the Coordinator reviewed the rules and prompted the youths to interact by asking them to tell their name and answer a simple question (e.g., “what is your favourite video game?”) for approximately ten minutes. Next, the youths were placed in groups of three. The groups were formed strategically by the Coordinator to give youths opportunities to work with new peers, to minimize confrontations, and to place some youths with familiar peers, as appropriate. In groups of three, the youths engaged in structured play (25 minutes) with the help of young adult volunteer staff who guided interactions; one volunteer was placed with each group. The youths co-operated by taking turns in the roles of builder, engineer, and supplier to build a LEGO® kit (e.g., building a bulldozer). In the final stage (unstructured play, 25 minutes), the youths were free to choose any kit and play alone or with others.

Many aspects of LeGoff’s (2004) clinical study served as direct models for the creation of the Program (e.g., rotation of the three roles, structured play followed by unstructured play, use of LEGO® as the toy, development of social skills). However, some aspects were modified. Instead of using the minimum number of sessions used by LeGoff’s (24 weeks, 90-minutes per week) intervention, the Program sessions included one-hour per week for 4-week and 8-week programs that continuously cycled through the calendar year. A few weeks after one session ended, a new session would begin. The Coordinator and the parents reported that the short length and the cycle of sessions made the Program easier for families to attend. For legal reasons, the Program allowed parents to be present in the room, even though LeGoff recommended against this practice. Finally, the Program included
youths with comorbid diagnoses and challenges relating to behaviour, anxiety, and attention deficits, although LeGoff’s study did not include such participants. By focusing on the Program, the current study answers a call by the research community (LeGoff, 2004; LeGoff & Sherman, 2006) to describe the most salient components of LeGoff’s structured play intervention. Although the Program we observed differed from LeGoff’s clinical work, it represents how clinical findings are applied in community-based programs. Community-based programs have been increasingly valued for spearheading effectiveness research and offering a promising approach for broad outreach. While efficacy research conducted in clinical settings serves to evaluate the impact of isolated variables, community-based programs utilize grassroots participation to strengthen multiple variables using a range of strategies (Wandersman & Florin, 2003). The transfer of clinical innovations to program delivery through research-informed community-based programs serves as a promising bridge between efficacy and effectiveness research (Altman, 1995). The Program highlighted in the current study was designed to take place in natural settings so that the skills required to participate would be transferable to other social environments (e.g., Koegel, Kuriakose, et al., 2012). Studying community-based programs, like the four-week program highlighted in the current study, may provide useful insights into the components of structured play interventions by describing their application in natural settings.

**Method**

**Participants**

The Program we studied included 17 youths, 12 of whom had a diagnosis of ASD (three with a comorbid diagnosis of attention deficit hyperactivity disorder). Of the five
youths who did not have ASD, one youth had a diagnosis of cerebral palsy, and four were typically developing siblings of the youths with disabilities. All of the participants were male, with the exception of one typically developing participant. The ages of the youths ranged from 7 to 12 years. The diagnoses of ASD were made by clinical psychologists or specialist diagnosticians. The ages of the youths at the time of diagnosis of ASD ranged between 3 and 10 years. Four pairs of youths were siblings. Many of the youths had participated in the Program in at least one previous session, as it runs cyclically throughout the year. Participants in this study also included nine mothers of the youths and six staff members: five unpaid volunteers and one paid Coordinator, all of whom were interviewed. The young adult volunteers ranged in age from 22 to 30 years (two were graduate students in the field of ASD; three were undergraduate students in fields unrelated to ASD) and had been involved in sessions prior to the session highlighted in the current study. The Coordinator was a qualified early childhood educator with more than 20 years of experience as an educator and program designer for youths with ASD. The observation data and interview data were collected by the research team in the building where the program was held, in a mid-sized city in Ontario. The research team consisted of two researchers and two research assistants, all graduate students in fields related to education. At the first session, informed consent was obtained from parents and staff, and informed verbal assent was obtained from the youths. The study had been cleared by a university ethics review board (see Appendix A). To protect the anonymity of the participants, pseudonyms are used throughout.
Procedures and Analyses

The purpose of the current study was to describe the application of LeGoff’s clinical model (2004) in a community-based program and to identify the most salient components of the Program. We gathered information using two data sources: observations and interviews. We chose the methodology of ethnography to gather information in the environment while the Program was taking place. Data analysis was an iterative process whereby the researchers constantly referred back to the interview transcripts and observation notes. The process of aligning several sources of data helped to triangulate the findings insofar as possible.

Prior to the observations, the research assistants were trained on observational guidelines (Nind, 2008) by the researchers. Those guidelines emphasized the importance of (a) considering the ethical complexities of observing participants with disabilities, (b) viewing participants as socially competent social beings, and (c) interpreting subjective meanings. The research team sat about 2 metres away from the youths and took notes during the program. To record observational notes, the research assistants were instructed to begin with comprehensive note-taking strategies and move to salience-hierarchy strategies as described by Wolfinger (2002). Immediately after each session of the Program, the research team met to discuss the content of the recorded observations. Those meetings were audiotaped and transcribed for analysis.

The method of interviews was chosen to provide the perspective of the youths, the staff, and the parents. The method of interviews (Mack, Woodsong, MacQueen, Guest, & Namey, 2005) presupposes the value of the participants as stakeholders in the collaborative work with researchers. The research assistants conducted brief semi-structured interviews
with the youths at the end of the last session, but did not receive informative data. Because the youths spoke little in the interviews, the researchers made the decision to omit these data from the analyses.

The interviews with staff and parents were conducted using semi-structured interview guidelines. The interviews with the young adult volunteers were conducted prior to the intervention, based on previous sessions in which they had been involved. The interviews with the parents were conducted during the final two sessions of the Program. The Coordinator was interviewed after the Program had been completed. The interviews were conducted by the researchers based on an interview protocol as recommended by Mack et al. (2005) which includes: (a) rapport-building, (b) perspective, and (c) adapting to emotional states. The interview of young adult volunteers included three areas of discussion: personal information, training and experience, and perceptions of the Program. The semi-structure of the interview guide for the parents included four areas of discussion: personal details (process of diagnosis), social-skills abilities of youths, play abilities of youths, and perceptions of the Program. The interviews were audiotaped and transcribed verbatim for analysis. Over 30,000 words of transcribed data were produced from interviews.

We analyzed transcripts of the interviews and observational notes with Atlas.ti version 7 software using a constant comparative method (Boeige, 2002). Using an exploratory method, two researchers conducted the first round of coding independently by attaching descriptive phrases to units of text. The coding results were compared and differences in opinion were resolved through discussion. Over 120 unique coding phrases were used at this stage. The researchers aggregated the descriptive phrases by topic and collaborated to produce preliminary code definitions. The researchers employed a qualitative
approach to reliability, which included the creation of seven code definitions through negotiation and tracing back to the original observational notes or text file when necessary to reach consensus. The code definitions were used to conduct a second round of coding. The researchers sorted and evaluated thematic codes and affiliated units of text to identify their theoretical value using descriptive methods, and used discussion to explore biases and settle disagreements. The researchers plotted seven thematic codes on a spectrum of implicit to explicit impact: indirect instruction, direct instruction, competence of staff, interest-based play, play-based learning, social bids by role, and phenomenon of three. During the final stage of analysis, during the drafting of this paper, the thematic codes were collapsed into four themes: (a) indirect instruction, direct instruction, and competence of staff were merged to form the theme instruction; (b) interest-based play remained a theme on its own; (c) play-based learning remained a theme; and (d) social bids by role and phenomenon of three merged to form the theme structure of the Program.

**Findings**

To describe the change in behaviour over the course of the program, we have included two vignettes, or “snapshots,” of Liam, an 11-year old youth with ASD (all names are pseudonyms). The first snapshot is from Liam’s life prior to participating in the Program and was described by his mother as typical of Liam’s ability to socialize with peers. The second snapshot is from observational notes made during the third session of the four-session social-skills intervention.

**Snapshots of Liam**

**Prior to the Program.** Liam’s mother reports that she knows that Liam wants to have friends but he is not sure how to initiate or sustain meaningful interactions. He
accompanies his mother when she visits an acquaintance who has a son Liam’s age. When the acquaintance’s son greets Liam, Liam does not reply. He makes funny faces and then asks, “Why are you looking at me like that?” Later, at home, he becomes emotional when telling his mother that he has no friends.

**During the Program.** Liam is in the same building group as Derek, an 11-year old youth with ASD. At first, the two boys interact only so far as required by their assigned roles, but soon they are engaging with each other with sustained eye contact and verbal exchanges. While they play, Liam shows Derek every block he is adding, and the two boys comment to each other on the structures they are building. Both boys are laughing and building for each other’s enjoyment. At the next week’s session, Liam seeks out Derek. When the Coordinator asks, “Who wants to build the four wheeler?” Liam puts up his hand and raises Derek’s hand saying, “I do, and Derek wants it too!”

The contrast between these snapshots exemplifies the type of change in behaviour that parents reported, and we observed, over the course of the Program. As we discovered, Liam’s experience was not unique. Consistent with the purpose of this study, we report here the components of the Program that emerged from our analysis and that may support changes in behaviour like those we report for Liam.

The results of the interviews demonstrated that the parents believed that the Program was effective. Specifically, parents told us that the Program helped to teach social skills such as initiations: “He will [initiate socially] more so now than he used to.” They also reported that the Program helped youths to develop meaningful friendships: “He does talk about the other kids … he [wants] to come.” While the perceptions of parents may not constitute robust empirical evidence, their perspectives should not be dismissed. Families of youths
with ASD are highly motivated to help their children develop and do not invest time in ineffective programs. It is not surprising that the parents reported that they perceive the social skills developed within the Program as meaningful because spending time with other youths and playing co-operatively generally have high social validity (Hurley, Wehby, & Feurer, 2010). It is important to verify that parents perceive the outcomes as valuable (Bellini, Peters, Benner, & Hopf, 2007; Cunningham, 2012). An analysis of the data revealed four components that may support changes in social behaviour of the youths involved in the Program: (a) instruction, (b) interest-based play, (c) play-based learning, and (d) structure of the Program.

**Instruction**

Based on our observations and reports from staff and parents, effective programming requires indirect and direct instruction from competent staff.

**Indirect instruction.** To create a cohesive environment that fosters social development, play-based social-skill programs require a minimum level of attention to task, co-operation, and collaboration, among other skills (LeGoff, 2004). By modelling, guiding, and mentoring social interactions, the young adult volunteers increased the social cohesion within the groups. The volunteers encouraged the interactivity of the youths. Members of the research team, acting as observers, noted that the volunteers were the “glue” that kept group play from separating and dissolving into independent play. Without the volunteer present, one researcher noted that “it would have been completely [independent] play.” When confrontations arose within a group, the volunteers gently refocused the attention of the youths. In her interview, the Coordinator shared some of the prescribed dialogue she encouraged the volunteers to use:
And when the kids are getting goofy, [the volunteers will] say, “Come on quit messing around. I’m here to build LEGO®. What do you come here to do? Are you here because you want to do this? I thought you came to build LEGO® with us.”

Typically developing peers also provided indirect instruction as they modelled appropriate behaviour for the youths with ASD. Parents attributed the Program’s success to having behaviour models among the other youths. One mother reported: “It’s a really good way to see how other kids do [it]. He’s very much a watcher. He’ll watch what everyone else is doing there.” The appropriate behaviour demonstrated by peers allowed the youths with ASD to understand and imitate socially acceptable behaviours. The Coordinator explained her decision to include typically developing siblings as peer mentors by saying:

Peers display typical behaviour for the kids on the spectrum. Having the siblings there who already have a child in their home on the spectrum, [they] tend to have better language. They talk [the] lingo. A lot of times, they already know the phrases to say. Give me the, pass me the, show me that. These are phrases that we used to prompt [appropriate behaviour], so they become little instructors.

**Direct instruction.** Direct instruction was necessary when the structure and support provided by volunteers and peers were not enough for the youths to regulate emotion in stressful situations. In situations of extreme emotion, the youths could become overwhelmed and leave the group. During two observed incidents, a youth with ASD spoke loudly in an argumentative tone, slapped the floor, tossed the toys down, and left the group. The Coordinator helped the youth identify the issue, solve the problem, and return to the group. To reach this end, the Coordinator reported she used a four-step strategy: (a) reduce the
tension, (b) brainstorm solutions, (c) role-play strategies, and (d) reintegrate into the social environment.

I wanted him to work it through. So we talked about Bakugan® [a game many of the youth played outside of the intervention]. [I asked,] “Do you play [a] game with it?” [He answered,] “Yes, I do play with it.” “Does that game have rules?” “Well, yeah.” “Then explain the rules to the game.” [So he did.] And I said that this game has rules too. They’re both games. That’s how I got him back to go to the group. [He] had to talk to the other boy. “I know you have to apologize, but you also tell him why you were upset.” We talked it [through]. We role-played it twice. We did it.

Competence of Staff.

Interviews with parents revealed a shared belief that the competence of the Coordinator and of the volunteers was important for the Program’s success. The Coordinator had extensive experience working with individuals with ASD, regularly demonstrated her understanding of the youths’ needs, and consistently enforced the rules and the structure of the Program. She reported that she was often called the “boss” or “principal” and that she led a strong group of volunteers who worked closely with each group of three youths. She felt that her strengths included responding effectively to the parents and volunteers as well as to the youths with ASD and their siblings: “I need someone, like me, strong. Strong to deal with parents, and the volunteers, and the kids.”

There was no one way for a volunteer to facilitate a group; the volunteers used a range of strategies to facilitate co-operation within their respective groups based on the needs of the members of each group. In their interviews, parents praised the positive influence of the volunteers: “They’re knowledgeable. Empathetic. I don’t know if it would
run smoothly without the [volunteers] in it. Because it could be very chaotic. It could be very stressful for the kids.”

**Interest-based Play**

We found that when youths with ASD engage in activities based on their interests, they are able to sustain their participation and to benefit from the Program. In the Program, the youths were motivated to play with the LEGO® toy. Our observations suggest the toy is an effective modality because the youths were interested in playing with it, thereby increasing their inherent motivation, and the toy’s range of use. The LEGO® toy is engaging and encourages creativity, but also offers structure for purposeful play. The Coordinator explained “LEGO® has … what we like to call closed-ended activity: with the beginning and an end. You start [with] the picture and you end with the product.”

Parents reported that their youths loved playing with LEGO® toys. Even though their youths might “drag their feet” (Parent, Interview) when going to other clubs, the youths were eager to attend a program that offered play with an interesting toy and a guiding purpose from start to finish. Many of the parents spoke of LEGO® as a “shared interest” and as a “currency” between friends or within families.

Part of the effectiveness of the toy was how co-operation is integral to play. To construct the object, youths were required to combine their efforts and interact with each other. All of the youths reported having the toy at home but were drawn to the Program because they were sharing the toy with others. Although the youths found LEGO® engaging and co-operated to build the kits, there were a few occasions when co-operation broke down. Breakdowns in appropriate social behaviour were seen most often after elements of
competition had been introduced during structured games or free play. As one parent explained:

I love seeing him co-operate … [with] his LEGO® classmates. It’s thrilling to see that because his attention span is quite short when learning a new activity at home. I’m thrilled to see him engaged and enjoying himself here. And paying attention. It’s encouraging. I don’t always see that.

**Play-based Learning**

In the Program, play was provided in two formats: structured play and non-structured play (free play). During the structured play portion early in each session, youths were required to co-operate with their peers to assemble an object. All group members had to fulfill their roles and co-operate with their peers in order to complete the activity. The co-operation during the structured play portion of each session allowed youths to become comfortable working with their peers and following the rules of play. As the sessions went on, the youths increasingly were able to transfer social skills learned during structured play to the free play, which occurred near the end of each session. The Coordinator described the difference between the first and last sessions:

I think it’s how they interact together. Like I was saying, there’s a big difference between the first couple of sessions [when they] really don’t know each other, where they just want to build things apart, [and] you have to tell them to play with a partner. And then by the end of the [series of sessions] they go to groups by themselves. They’ll play together on their own. And I think that’s the success. We want them to initiate the social interaction.
In addition to play being the focus for participants, a paramount feature of the Program was the way in which play rules translated into social rules. The Coordinator described the transferability of play skills for social interactions:

You work on [play and social skills] at the same time. Some kids are working on play skills. How to play cars. How to put it down and how to roll the car back and forth. But he does it with a peer. Because peers are a big part of that. They may take turns putting it down. The social [skills are] the skills that you learned to play. I think the two go together. I think the two have to go together.

The process of negotiating the order of roles (e.g., who will assume the role of builder first) provides an authentic opportunity for the youths to practise negotiation. At first, the youths may only be able to keep calm and be patient, but as they develop, they are more able to negotiate, take turns, and collaborate. By framing social skills as play skills, youths developed skills such as patience and turn-taking while engaging in inherently interesting activities. The Coordinator explained:

[Youths] want to be the builder first. So how are we going to do that? You can do all different kinds of things. You can pick a number. You can’t bargain at the beginning but you can later. The kids have to build the skill before you can bargain for builder first … They understand how that works. Some kids who like to build will say, Okay, I hope to be the builder second, you be the builder first. We’ll say, “Don't worry. Your turn is coming, it’s only 10 minutes.”

Structure of the Program

As we observed the social roles within the groups, we noticed that the structured play provided a sequence of social initiations and responses. The three stages of the social
sequence require an initiation and a response: (a) engineer tells the supplier what block is required, (b) supplier gives the block to the builder, and (c) the engineer tells the builder where to place the block (see Figure 1). To differentiate between initiations and responses, we used polarity symbols: initiations (+) and responses (-). The role of the engineer (+/+), involves two initiations because the engineer initiates with the supplier and also with the builder. The role of the supplier (+/-) responds to an initiation from the engineer and initiates with the builder. The role of the builder (−/−) responds to both the engineer and the supplier, and is not required to make any initiations. Being able to initiate social exchanges is a skill that, if learned and practised in natural settings, leads to more successful social interactions (Barakova, Bajracharya, Willemsen, Lourens, & Huskens, 2014).

![Figure 1. The exchange of social bids by role](image)

**Phenomenon of three.** The social sequence, as depicted in Figure 1, is based on a dyad model of interaction. At each step of the social sequence, two group members interact while the third waits. That in–out model of participation provides a constant cycle of participation, exclusion, and reintegration. The process affected the physicality of the groups. The youths altered their seating positions to accommodate the social sequence. One
observer noted: “In my group I noticed that two boys sat [legs folded] facing each other [to complete their roles] and the [third] would be very much on the outside. Physically, on the outside.”

Parents considered these social sequences to be somewhat uncomfortable for the youths, but the process of having to reintegrate constantly into the social exchange was considered by adults in the various roles—parents, observers, and staff—to be a valuable practice. One parent explained it by saying:

I think the best part is the socialization with other kids. I think the structure and being with different groups each time. It’s beneficial for him. Being forced to interact with other people. Being forced to do that. The more we can force these social interactions, the better.

In short, the distinct roles (builder, supplier, engineer) required the youths to constantly reintegrate into the social sequences thereby practising important social skills such as initiating and responding to social exchanges.

**Discussion**

For the majority of the families in this study, community-based programs will be the closest they get to clinical interventions. While community-based programs may not have all of the advantages of clinical settings, many program designers incorporate evidence-based strategies into accessible programs to teach skills that have high social validity. Community-based programs have an important role for many families of youths with ASD (Stadnick et al., 2015). Purposeful programming is important for youth with ASD because unstructured play alone does not provide opportunities to practise social bids. According to the parents, unstructured activities do not lead to interactive, social play. In the words of one mother, her
son does not develop socially when participating in unstructured activities: “[He] tries to play with … his friends but he usually ends up chasing them…. He can’t handle any of it.” The message from the interviews and our observations has been consistent: The value of this program is in its design. Our goal has been to explore the components within one community-based program based on observations, so that we can describe the components that best support the changes in behaviour.

Socially Valid Outcomes

Designing accessible, affordable programming that develops social competence among youth with ASD is fundamentally difficult because researchers do not subscribe to a universal definition of social competence and do not agree on how to teach or measure it. The types of outcomes that are important to parents and youth with ASD—the ability to make and maintain friendships, co-operate with others, and socialize meaningfully with peers—are valuable (Hurley et al., 2010) but are not easily measured or improved in the short term. The challenge of social-skill interventions is to help youth develop measurable skills that are also socially valuable (Bellini et al., 2007; Cunningham, 2012). Program designers should ask parents to verify that the skills being taught are useful. Spending time in social interactions with peers and co-operating during play activities are usually rated as valuable by parents and youth (Hurley et al., 2010). If the goals of and outcomes achieved by community-based programs are not perceived as valuable, parents will not continue to enrol their children.

Instruction

One of the keys to effective program design is the inclusion of direct and indirect instruction provided by competent staff (Banda & Hart, 2010). In the case of this program,
we observed that the volunteers fostered and sustained meaningful interactions among the group members beyond serving as models themselves, and encouraged typically developing peers to act as models for the youths with ASD. As in prior research (Ogilvie, 2011; Sperry, Neitzel, & Engelhardt-Wells, 2010; Trembath, Balandin, Togher, & Stancliffe, 2009), the use of peer mentors within a highly structured and purposeful format was particularly effective. The use of peer mediation has also been well documented in the literature (Choi, 2007; Kamps, 1997; Morrison, Kamps, Garcia, & Parker, 2001). In his socio-cultural theory, Vygotsky (1978) identifies the presence of a more knowledgeable other as being necessary for individual growth within the zone of proximal development. With supportive modelling, guiding, and mentoring by staff and typically developing peers, youths with ASD were able to engage in social interactions they could not have accomplished independently. Adult and peer mentors working to refocus the youths are not enough to foster independence. The youths also had to be able to self-monitor and self-regulate. The importance of such self-appraisal to achieve social skills has been demonstrated in previous studies (Goldstein & Naglieri, 2013; Soares, Vannest, & Harrison, 2009). The volunteers and the peer models encouraged self-evaluation of the goals and of the means to achieve them.

**Skill Development and Practice**

When youth with ASD experience difficulty socializing, an easy assumption may be that the youth need to learn social skills to compensate. Acquisition deficits are not the only reason why youth with ASD find socializing problematic (e.g., Koegel, Vernon, Koegel, Koegel, & Paullin, 2012). According to Gresham (1981), they may also have difficulty socializing because of performance and fluency deficits. High-functioning youth with ASD, such as the youths highlighted in this study, may have the skills they need but not perform
them (performance deficits) or not perform them adequately (fluency deficit; Bauminger-Zviely, 2013). When programs are designed to include opportunities to practise social skills with dynamic and constant feedback (Gresham, 1981), youth with ASD have better opportunities to demonstrate their skills (e.g., interacting with a robot humanoid; Barakova et al., 2014).

**Interests**

Even with the supports provided by the Program, learning and practising social skills, (such as making initiations), can be difficult for youth with ASD, who may show low motivation for the tasks. Despite these challenges, we observed, and the parents reported, that the youths were engaged with the program and highly motivated to participate. According to the staff and the parents, the youths were motivated to participate because the activities included objects and activities that were particularly interesting to them.

Interventions and programs designed with a consideration of the interests of the youths have been shown to improve cognitive and behavioural progress (Campbell & Tincani, 2011; Dunst, Trivette, & Hamby, 2012). Simply stated, research is beginning to show that, when the interests of the youth with ASD are included as an integral part of the intervention, youth with ASD seek educational situations (Koegel, Kuriakose, et al., 2012; Otero, Schatz, Merrill, & Bellini, 2015).

**Game-based Activities**

Incorporating game-based activities is effective for social-skill interventions because, when instruction is structured and direct (Wolfberg, 1999), the use of games appears to rectify lack of social imagination (Chung, Vanderbilt, & Soares, 2015; Kryzak, Bauer, Jones, & Sturney, 2013). Games can compensate for deficits such as lack of social cohesion (Lin,
Not only do youth with ASD usually enjoy playing, but the rules of the games can also be aligned to mirror social rules (Lin, 2010; Pang, 2010; Tanaka et al., 2010; Wong, Morgan, Crowley, & Baker, 1996). This means that game-based activities are promising venues for community-based programming, especially when the activities are designed to specifically mimic critical social skills.

In the cases of LeGoff’s study (2004) and the Program highlighted in this study, learning to initiate and respond to social interactions was encoded into the play. We observed that the youths preferred the builder role: “What I saw time and time again through the night, each boy liked to have the builder role. Whether that was structured play or free play.” At first, we presumed they preferred the builder role because the builder is the only role that actually handles the toy. On closer analysis, we realized their preferences were based on how many social initiations were required within each role. The role that required the fewest initiations, the builder, was the most preferred. The role that required the most initiations, the engineer, was the least preferred. This finding aligns with previous studies that showed that making social initiations is difficult to teach (Jones & Carr, 2004; Taylor & Hoch, 2008). Initiations are also closely related to social competence (LeGoff, 2004) and, for this reason, initiations are often used as a test of social competence (e.g., Barakova et al., 2014).

Implications for Practitioners and Researchers

Based on our observations and interviews with parents and staff, we recommend that programs incorporate objects and activities of interest as well as elements of play as much as possible. Incorporating interests in play-based activities is not enough to help youth develop the complex skills that are required to socialize effectively. The findings of this study
suggest that programs should also include: (a) structured play followed by free play, (b) interactions that require the initiation of social bids, and (c) development of self-regulation through peer modelling and instruction that includes gradual release of responsibility to the youths. It is important for researchers to continue to investigate how each component contributes to outcomes of the intervention and which of these components are most critical to increase social skills, so that community-based interventions can become simpler and more efficient to implement while remaining effective. When exploring the application of clinical research in community-based programs, it may be helpful to align the components of the program to specific social-skill deficits. For example, the five subscales reflected in the Social Responsiveness Scale Version 2 (i.e., social awareness, social cognition, social communication, social motivation, and restricted interests and repetitive behaviour; Constantino & Gruber, 2012) may represent different deficits which require unique program components. Program designers may be able to improve the effectiveness of community-based programs if the individual social deficits of the participants are considered when choosing program components.

Limitations

In the current exploratory study, the use of qualitative methods was appropriate to further our understanding of the nature of the intervention through direct observation and interviews. However, future studies would benefit from the adoption of a program evaluation methodology to conclusively demonstrate the effectiveness of this Program. The current findings assume that the results of LeGoff’s (2004) clinical study can be generalized to community-based programs. Even though interviews with the staff and parents support the idea that this Program is effective as a social-skill intervention, this assumption may limit the
findings. A further limitation of this study was that it relied entirely on the viewpoints of female parents and included only male youths with ASD. However, the primary caregivers who brought the youths to the Program were mothers, and the youths who were enrolled in the program were males. Previous studies on the experience of parents of youth with disabilities also have more often included the viewpoints of mothers than of fathers (Woodgate, Ateah, & Secco, 2008). This is a limitation common to research in the larger field of exceptional education.

The focus we put on Liam’s experiences helps us to put a face to the type of learning that happened in the structured play Program. Liam’s successful social interactions may have felt like child’s play to him, but they included sophisticated social skills. Our understanding of how interventions like these work is improved when the intervention is framed by Vygotsky’s (1978) learning theories. In particular, the transition from role play to free play structures in the Program exemplifies the gradual release of responsibility approach to teaching play skills. Youths are given the opportunity in the latter part of each session to use these skills with less structure and less support from the staff and the peer mentors.

Besides skill development, many youth with ASD require opportunities to practise the skills. Community-based programs can be useful forums for practice because they can include motivating activities in settings that resemble natural social settings. In the case of the Program highlighted in this study, youths with ASD developed the skills they needed as they practised social skills with immediate and dynamic feedback within interesting play activities that were structured to require socialization. In particular, this study provided a closer look at the role of interests in social-skill interventions for youths. Without the inherent draw of the LEGO® toys, the youths would not likely submit themselves to the
complex roles, such as the role of engineer, which involves the least amount of contact with the toy and requires the highest level of social bid initiation. This study sheds light on the congruity of play skills and social skills. In instances such as this Program, play skills go further than fostering social skills; play skills are social skills.
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CHAPTER 3: DEVELOPMENT OF SOCIAL COMPETENCE OF YOUTH WITH AUTISM SPECTRUM DISORDER THROUGH A PLAY-BASED INTERVENTION USING THE MINECRAFT™ VIDEOGAME

Youth with autism spectrum disorder (ASD) may find socializing and participating in social play challenging (American Psychiatric Association [APA], 2013) for a variety of reasons, such as difficulty exchanging social bids (Murdoch & Hobbs, 2011), sharing attention (Pruett et al., 2011), and understanding different perspectives (Baron-Cohen, Leslie, & Frith, 1985). The social competence of youth with ASD may also be limited if the youth are less able than peers to focus on shared objects (Pruett et al., 2011), develop imaginative play, and extend restricted interests (South, Ozonoff, & McMahon, 2005). If the imaginative play and social skills of youth with ASD do not develop sufficiently, the youth may be excluded from play situations because their social play does not maintain peer interest (Anderson, Moore, Godfrey, & Fletcher-Flinn, 2004; Jordan, 2003).

Engaging in social play is how children learn to socialize (Gresham, 1981) so when youth with ASD are excluded from play, they miss out on the opportunities they need to practice and develop social abilities (Bauminger & Kasari, 2000). As a result, youth with ASD may have difficulty integrating into social circles and may spend adolescence feeling lonely and isolated (Bauminger, Shulman, & Agam, 2003; Locke, Shih, Kretzmann, & Kasari, 2015). The consequences of poor play skills may extend beyond adolescence. Poor social play and social exclusion predict social difficulties with peers later in life (Sigman & Ruskin, 1999) and delayed language skills as an adult (Lyytinen, Poikkeus, Laakso, Eklund, & Lyytinen, 2001).
Considering the consequences of poor social skills, helping youth with ASD develop social competence is one of the fundamental goals of intervention research both in clinical therapies (e.g., Chung, Vanderbilt, & Soares, 2015) and community-based programs (e.g., Carter et al., 2004). While clinical therapies have been effective at supporting the development of youth with ASD and have been instrumental in the validation of evidence-based practices (e.g., LeGoff, 2004), community-based programs may have some advantages over clinical therapies. Unlike clinical therapies, which can be costly and may require considerable time commitments from the participating families, community-based programs are often relatively low-cost, accessible to rural and suburban families, and work on a drop-by basis. Furthermore, community-based programs can be designed for naturalistic settings, such as libraries, schoolyards, and recreation halls (Koegel, Kuriakose, Singh, & Koegel, 2012; MacCormack, Matheson, & Hutchinson, 2015; Stadnick, Stahmer, & Brookeman-Frazee, 2015). When youth with ASD participate in naturalistic settings, they are able to transfer skills to school and community settings because they have developed and practiced skills in the settings where they would naturally socialize (Baker, Koegel, & Koegel, 1998; Dunst, Trivette, & Masiello, 2012; Koegel, Kuriakose, et al., 2012; Koegel, Matos-Freden, Lang, & Koegel, 2012).

Despite the advantages offered by community-based programs, they are not always effective (Bellini, Peters, Benner, & Hopf, 2007; Grynszpan, Weiss, Perez-Diaz, & Gal, 2014; McConnell, 2002) because program designers may not incorporate evidence-based strategies (Drahota, Aarons, & Stahmer, 2012; Ratcliffe, Wong, Dossetor, & Hayes, 2014; Stadnick et al., 2015). Therefore, it is important to evaluate how evidence-based practice from clinical studies can be best applied to community-based settings. Methods that have
been suggested as effective for improving social play and social competences of youth with ASD include peer mediation (Odom et al., 2002; Reichow & Volkmar, 2010), video modelling (Sansosti & Powell-Smith, 2008; Scattone, 2008), and play-based interventions (LeGoff, 2004; MacCormack et al., 2015).

Peer mediation can be an effective way to help youth with ASD improve social competence (Allen & Barber, 2015; Conn, 2014; Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012; Mason et al., 2014) because, when interacting with typically developing peers, youth with ASD use more complex social strategies than when interacting with developmentally similar peers (Bauminger et al., 2003; Odom et al., 2003). Typically developing peers can be effective mediators for social skill interventions in a variety of group settings (e.g., dyads, Laushey & Heflin, 2000; triads, LeGoff, 2004; networks, Mason et al., 2010). The effects of peer mediation can be further improved when the peers are trained and when the peer mediation is combined with adult facilitation (Bass & Mulick, 2007).

Video modelling has been used to promote behaviours such as appropriate classroom interactions (Burton, Anderson, Prater, & Dyches, 2013), effective communication skills (Gelbar, Anderson, McCarthy, & Buggey, 2012), and reciprocal social interactions (Boudreau & Harvey, 2013). Video modelling uses carefully edited video recordings of the youth, or an age-appropriate peer, to demonstrate examples of preferred behaviour. Video modelling is well suited to support youth with ASD because the youth may have an interest in the device (Bernard-Opitz, Sriram, & Nakhoda-Sapuan, 2001; Moore & Calvert, 2000). As well, they tend to have easier times processing social information when it is cued visually (Quill, 1997). Video modelling may additionally be well suited for youth with ASD because
viewers are not required to have reading or social skills (Nikopoulos & Panagiotopoulou, 2015).

Play-based social interventions are considered a promising practice (Simpson, 2005) and have been used to improve attention span, language skills, and reasoning skills (e.g., Barakova, Bairacharya, Willemsen, Lourens, & Huskens, 2014; Koegel, Kuriakose, et al., 2012; Neugnot-Cerioli, Gagner, & Beauchamp, 2015). These interventions have used a variety of activities (e.g., block construction, LeGoff, 2004; outdoor recess games, Baker et al., 1998; musical interactions, Elefant & Wigram, 2005; technology, Barakova et al., 2014). Play-based interventions are popular for families of youth with ASD and program designers because the interventions can be designed for a range of settings, use objects and activities that are interesting to the youth, and include typically developing peers. Play-based interventions are most effective when they are designed so that youth participants are required to exchange social bids (e.g., Jull & Mirenda, 2010; Koegel, Kuriakose, et al., 2012; LeGoff, 2004), as unstructured play has not reliably improved the social competence of youth with ASD (e.g., Chung et al., 2015). When youth with ASD participate in Structured Play that requires social interaction, they can develop social skills, such as making initiations, co-operating with others, and taking turns (e.g., LeGoff, 2004).

**Study Design**

The purpose of this study was to design and evaluate the effectiveness of a social skills intervention within a naturalistic, community-based setting that incorporated interests into videogame activities for boys with ASD ages 11–13. This study explored the extent to which the social competence (e.g., rates of initiations) of these boys changed over the course of Structured Play activities and the extent to which the changes were maintained and
transferred to social interactions outside of the Structured Play activities. In particular, this study explored the processes by which four boys with ASD developed social skills through engagement with direct instruction, guided learning, video modelling, and practice with a typically developing peer. The study had been cleared by a university ethics review board (see Appendix B).

**Method**

**Participants**

The participants for this study were four boys (ages 11–13). Participants with ASD were recruited using social media flyers and listserv emails from ASD associations (e.g., Autism Ontario). One typically developing youth, a sister of one of the boys, also participated in the sessions; she is referred to in the paper and transcripts as Lindsay. Besides Lindsay, all of the youth had a diagnosis of ASD from a psychiatrist or medical doctor.

The adult volunteers and the Coordinator were recruited because of their experience with community-based social intervention programs. The adult volunteers had more than three years’ experience as facilitators of the play-based social program described in Study 1 (MacCormack, Matheson, & Hutchinson, 2015). For Session 6, one of the adult volunteers was absent and was replaced by another undergraduate-aged adult volunteer. The Coordinator had over 20 years of experience working with children and adolescents with ASD and was also Coordinator of the social program described in Study 1.

Before and after the intervention, interviews were conducted with each of the four boys and at least one parent to establish learning profiles, preferred leisure activities, and the study’s level of social validity. Both the purpose and the method of the study had high social validity with the parents and their children. Before the intervention, parents completed the
Social Responsiveness Scale, Version 2 (SRS-2; Constantino & Gruber, 2012), a measurement tool designed to determine the severity of social challenges (see Table 1 for SRS-2 scores of participants). The four boys with ASD are referred to in this paper as Enoch, Dan, Peter, and Oliver.

Table 1

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>AWR</th>
<th>COG</th>
<th>COM</th>
<th>MOT</th>
<th>RRB</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enoch</td>
<td>11</td>
<td>66</td>
<td>68</td>
<td>79</td>
<td>71</td>
<td>84</td>
<td>78</td>
</tr>
<tr>
<td>Dan</td>
<td>12</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>&gt;90</td>
</tr>
<tr>
<td>Peter</td>
<td>13</td>
<td>79</td>
<td>63</td>
<td>66</td>
<td>67</td>
<td>69</td>
<td>70</td>
</tr>
<tr>
<td>Oliver</td>
<td>11</td>
<td>45</td>
<td>55</td>
<td>66</td>
<td>71</td>
<td>59</td>
<td>69</td>
</tr>
</tbody>
</table>

AWR=social awareness, COG=social cognition, COM=social communication, MOT=social motivation, RRB=restricted, repetitive behaviour, mild=60-65, moderate=66-75, severe=>76

**Enoch.** Enoch was an 11-year-old boy diagnosed with ASD. Enoch was excitable and highly verbal; during the interview and sessions, he enthused about Minecraft™ and other topics of interest using his extensive vocabulary. During the study sessions, the other youth sometimes had a hard time understanding what Enoch said because he spoke quickly and with a slight lisp. When asked how well he co-operated with others, Enoch said that he did pretty well: “I actually do pretty good. I’ve done that before. Lots of stuff like that. I’ve also played with my friends pretty good. I’m pretty good anyways.” When Enoch stepped away from the interview, his mother reported that Enoch experienced difficulty when he tried to initiate conversation and maintain friendships; “He has a couple of buddies that he plays with. It’s a little harder for him to sustain those kinds of relationships.” His mother reported that Enoch often perseverated on a single topic and repeatedly asked the same question, such as “Like, ‘so Dad is picking me up?’ ‘Yes.’ ‘So, Dad is picking me up?’”
According to his parents, Enoch had a hard time in school because he did not feel successful. Enoch asked his mother if she “could help make him smart.” His mother said “Usually if a kid gets a bad math mark, you can say ‘oh, don’t worry because you’re great at another subject,’ but, in his case, he’s just not great at anything. Average and struggling.”

When asked what activity he loved to do more than anything else, Enoch indicated he loved Minecraft™ more than anything else. His father reported that Enoch felt good about his ability to play Minecraft™: “One thing he can do right now really well is Minecraft™. He’ll say ‘I’m an expert in Minecraft™.’” His parents hoped that sharing his expertise and interest in Minecraft™ with others would be helpful because “it’s something he can do and be proud of, but it’s not going to turn the other kids off.”

**Dan.** Dan was a 12-year-old boy with a diagnosis of ASD. Dan also had multiple comorbid diagnoses: fine motor problems related to cerebral palsy, reduced vision and hearing, and a learning disability (reading). Additionally, as his mother reported, psychometric testing had shown that Dan was gifted. Despite his multiple conditions, Dan’s mother reported that Dan compensated extremely well. In his everyday life, Dan used assistive technology (e.g., text-to-voice software) to read text and, when assistive technology was not available, used by-pass strategies to avoid letting others know of his challenges. Dan’s mother reported that he had strong verbal skills and, once he understood the system, he liked to be in charge.

Among his favourite activities, Dan said that he liked to swim, sail, and play with toy guns but, above all, he loved Minecraft™. He played Minecraft™ with other boys, whom he considered to be his friends. When asked how well he co-operated, Dan said he co-operated “fairly well.” When asked to provide an example, Dan said that building houses in
Minecraft™ could be difficult because friends might disagree on how many bedrooms to build. To solve the problem, Dan said that he “split the house in half and one place was [his friend’s] and one place was [Dan’s].” His mother reported that Dan’s socialization was “not the best.” According to his mother, Dan did not understand personal space and common courtesies such as greeting others. Even though his mother said that she worked on socializing with him every day, Dan had a hard time listening and understanding the feelings of others: “He needs to learn compassion and know what it means. He knows the word, but he doesn’t understand it. He just doesn’t get it.”

**Peter.** Peter was a 13-year-old boy with a diagnosis of ASD. He enjoyed playing Minecraft™, but also had intense interests in chess, Youtube videos, math, and science. Peter had reduced fine motor control in his hands; he experienced difficulty holding an iPad while still using the touch-screen controls.

Peter’s parents reported that Peter enjoyed videogames: “He’ll never tire of videogames.” According to his parents, Peter’s first friend was his younger sister. Peter and his sister played together at home and at school during recess. When his sister was not available, Peter did not play with anyone else. Peter’s sister was the typically developing peer (Lindsay) who participated in the study.

Peter’s parents said that he enjoyed playing with other youth, but he did not initiate interactions. Peter required encouragement to socialize with his friends. When asked how well he got along with others, Peter said “I sometimes have downs and sometimes I have ups. More ups than downs.” With his friends, he preferred “being alone [together] so we can do our own things with no one with us.” When he played with others, Peter could become frustrated: “Sometimes that frustration bubbles and pops and I do stuff I shouldn’t.”
When asked what would help Peter to socialize more capably, Peter’s parents reported that Peter had difficulty socializing because he lacked social motivation and had reduced social communication skills. Peter was present during the interview so the following comments were partially directed at him:

Maybe it’s introducing himself. But you’ve been getting better. Maybe it’s the small talk, and finding out what people are interested in. When you find out that people are interested in things that you’re interested in, it’s better. Lately he’s been taking board games to school and doing it for several days so people start doing it. The first day no one would play, then the next day more people would play. You’re finding a way of getting people’s common interest, if that’s a skill that could be encouraged.

**Oliver.** Oliver was an 11-year-old boy with a diagnosis of ASD. Oliver did not enjoy or participate in active sports because of a birth defect. He enjoyed playing low-impact games with his grandparents, who were his legal guardians, and with his friends at school. Oliver said his favourite activities were reading, watching television, and playing Minecraft™. His guardians tried to keep him away from violent and aggressive activities and videogames. Oliver found it hard to organize his thoughts and, when pressed for an answer, often claimed that he forgot the answer. For example, when he was asked what he loved to do, he replied, “[I’m] trying to remember; I just can’t remember.”

When Oliver was in Grade 1, he was the victim of bullying and, his guardian reported, “he has never forgotten that.” Since the time when he was bullied, Oliver has experienced anxiety when around adolescents his age. His guardians said that Oliver “walks the playground by himself.” His guardians reported that Oliver’s deep anxiety was the reason he returned home early from a week-long overnight camping trip. Oliver’s guardians
hoped that he would complete high school, but they did not have many other goals for him; “we haven’t considered it much. We take it every day at a time.”

**Settings and Materials**

The study took place in a large classroom at a university campus. During the sessions, the youth and adults sat in chairs around tables either in small groups of three or four (Structured and Free Play) or as a large group of eight (during opening circle and closing circle). The parents and guardians of the youth waited in an adjacent conference room. Even though the parents and guardians could view the session through the glass wall, they generally did not watch the sessions. The youth and adults played with the Minecraft™ Pocket Edition app on third-generation iPad mobile tablets, with the exception of Peter, who preferred to use the app on a mobile phone because of challenges with motor control. The mobile devices were connected on private multiplayer servers, through a WiFi router. Video recordings of interactions during Structured Play, Free Play, and Non-play were collected using four video cameras on tripods. Additional audio recordings were collected using three voice-recorders. In-game interactions in the virtual environment were collected using screen-cast software and a laptop (see Figure 2 for layout details).

![Figure 2. Physical layout of sessions.](image-url)
Procedures

The play intervention included a one-hour pre-session, six one-hour sessions, and a one-hour post-session of play among two adult volunteers, one typically developing peer, the four boys with ASD, and the Coordinator. The researcher was also present during the sessions. During the first and final sessions (pre-session and post-session), the youth participated in a one-hour session of Non-play (conversation) and Free Play in groups of three or four. During the middle six sessions, the youth and adults participated in Structured Play and Free Play (see Table 2) of Minecraft™ in small groups of three (one adult and two youths with ASD) or four (one adult, two youths with ASD, the typically developing peer).

Table 2

<table>
<thead>
<tr>
<th>Activity Type by Sessions</th>
<th>First Activity</th>
<th>Second Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-session</td>
<td>Non-play</td>
<td>Free Play</td>
</tr>
<tr>
<td>Sessions 1-6</td>
<td>Structured Play</td>
<td>Free Play</td>
</tr>
<tr>
<td>Post-session</td>
<td>Non-play</td>
<td>Free Play</td>
</tr>
</tbody>
</table>

The present study did not include multiple baseline data collection to control for the potential of familiarity effect (i.e., social improvements caused by familiarity) because doing so would have required that the adolescents play the video game without intervention features simply to establish baseline levels of social interaction. Only being an eight-session intervention, requiring the adolescents to play without guided support from adults, video modelling, and peer support was considered contrary to the goal of providing a program that supported their social development. Additionally, in the interviews, parents of the
participants reported that baseline data were not necessary because the boys’ abilities to make initiations were profoundly limited, even when socializing with familiar peers and family members. The collection of non-structured videogame play baseline data to verify the parents’ reports had low social validity with parents. Also, the variable of rates of initiations has been shown to be largely impervious to familiarity effect (e.g., Koegel, Kuriakose, et al., 2012), which is part of the reason why the variable is used in the field. Further guarding the results from familiarity effect is the fact that the boys with ASD played with a different arrangement of youth and adult volunteers every session. Any improvements in social competence between sessions were being shown despite a change of players.

**Structured and Free Play.** During Structured Play, youth chose a building project from the available researcher-designed objective cards (e.g., build an aquarium for a giant whale, build an underground bomb shelter; see Figure 3) and negotiated their roles. For each objective, the youth alternated roles of Architect, Artist, and Foreman. The Architect designed the building objective using words, drawings, or symbols on a white board. The Artist chose the colours and design flourishes for the Architect’s design. Once the Architect and the Artist completed the design, the Foreman led the group in building the objective according to the plans. During Sessions 1-6, the groups attempted to complete three objective cards per session and rotated roles so that each youth had a turn in each role. Due to late arrivals and time restraints in Session 4, however, the youth moved to Free Play after only two objective cards. After Structured Play, the adolescents participated in Free Play. No longer bound by objectives or roles, they were free to build or explore alone or with others.
As part of the pre-session and post-session activities, the youth were asked to engage briefly in conversations on topics of their interest in groups of 3 or 4. During the pre-session discussion (9.5 minutes), the youth were asked to discuss their favourite activities and learn something about each other. During the post-session discussion (10 minutes), the youth were asked to discuss their favourite activities during the sessions.

**Circle Time.** The opening and closing routines of the sessions included a process called Circle Time, which is typical of community-based social skills interventions (e.g., MacCormack, Matheson, & Hutchinson, 2015). When the youth arrived with their parents or guardians, they joined the Coordinator and the two adult volunteers around a large table for Opening Circle. During Opening Circle, the Coordinator welcomed the youth and discussed the session (e.g., safety rules, expectations). At the end of each session (after the activities), the youth joined the Coordinator and two adult volunteers for Closing Circle. During the Closing Circle, the Coordinator and the youth debriefed the session and discussed their favourite moments of the session.
Video social stories (video modelling) were introduced during the Circle Time discussions. During Opening Circles in Sessions 2-6, the youth were shown a short video clip (less than one minute) of themselves demonstrating preferred communicative and social behaviours. The video recordings of in-person and in-game interactions from the previous week were used to create video social stories for the youth that promoted pro-social behaviour. While they watched the video social stories (see Figure 4), the Coordinator explained how the video social story demonstrated appropriate social interactions and set a goal for each of the youth. During Closing Circle, the Coordinator and the boys discussed the extent to which they achieved the goals set out in the video social stories.

Figure 4. Screenshot of video social story for Session 2.

The goals for Sessions 2 and 3 were consistent across all four boys with ASD (e.g., for Session 2, all the boys shared the goal of “increased shared joint attention, in person”), while the goals for Sessions 4-6 were individualized for each boy. See Table 3 for the feedback and goals for the youth in Session 6 as an example of the types of feedback and goals set for each boy.
Table 3

*Feedback and Goals for Youth, Session 6*

<table>
<thead>
<tr>
<th>Youth</th>
<th>Feedback from previous session</th>
<th>Goal for current session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enoch</td>
<td>Nice job giving clear instructions and working as a team.</td>
<td>Listen to Peter so that you know what the team wants. Ask the adult and Peter what they want. Think about ways to do things so that everyone has fun!</td>
</tr>
<tr>
<td>Dan</td>
<td>You did a great job keeping Enoch and the adult on track.</td>
<td>Listen to the group and make sure that everyone is working together and having fun.</td>
</tr>
<tr>
<td>Peter</td>
<td>Great job talking through the project with the adult and Dan.</td>
<td>Find ways to work with Enoch so that you two are co-operating.</td>
</tr>
<tr>
<td>Oliver</td>
<td>You did a great job explaining what you want with words.</td>
<td>Explain your thinking to Lindsay and Dan.</td>
</tr>
</tbody>
</table>

**Supported social interactions.** Adult volunteers and the typically developing peer sat with the four boys during play times, played the game, and took on roles, as necessary. Much like the role of competent adults in other play-based programs (e.g., LeGoff, 2004), the adults and typically developing peer supported the social interaction and the cohesion of the group work by modelling appropriate behaviour and guiding social interactions. During the activities, the Coordinator observed the interactions, encouraged the youth to communicate their thoughts, engaged the youth in general conversation, and, when necessary, intervened to resolve conflict. As described in previous studies (e.g., MacCormack et al., 2015), the Coordinator used a four-step strategy to help the youth regulate emotion and stress (i.e., reduce tension, brainstorm solutions, role-play strategies, reintegrate youth into social context).

**Social Responsiveness Scale, Version 2**

The Social Responsiveness Scale, Version 2 (SRS-2; Constantino & Gruber, 2012) is a brief (15–20 minutes) screen for youth with ASD, ages 4–18, designed to assess the severity of social deficits associated with ASD. The SRS-2 includes 65 items and can be
completed by multiple raters who have at least a month of experience with the youth being assessed. Subscales (e.g., social awareness) include items (e.g., “knows when he/she is too close to someone or invading someone’s space”) that can be answered on a 4-point scale: not true = 1, sometimes true = 2, often true = 3, and almost always true = 4. The subscales do not include enough items to singularly inform decisions on instructional strategies (Constantino & Gruber, 2012) but, as a whole, the SRS-2 total score is considered a reliable measure of social deficits related to ASD (Bruni, 2014). The use of SRS-2 has been identified as less capable of measuring treatment effect (McMahon, Lerner, & Britton, 2013) and is usually used to develop a youth profile to verify intake eligibility (e.g., greater than T-score of 60, McMahon, Vismara, & Solomon, 2013).

**Coded Variables**

Video recordings of in-person and in-game play were coded to determine the quality of social play using three variables: rates of initiations, levels of engagement, and affect. Rates of initiations, level of engagement, and affect are commonly chosen as targets for adult-facilitated and peer-mediated interventions (e.g., Kasari et al., 2012; Kretzmann, Shih, & Kasari, 2014). All three variables were coded as the frequency or score of the variable during each interval of 30 seconds.

Frequency of initiations is a measure of the number of spontaneous peer-directed utterances that were not preceded by another youth’s question or comment requiring a response (Reichow & Sabornie, 2009; Tzanakaki et al., 2014). When coding the rates of initiations, a conservative definition was used when it came to role-based interactions. During Structured Play, peer-directed utterances were not considered spontaneous if they were latently required by the boy’s role. For example, a peer-directed utterance by Dan
during Session 5 (“Okay everyone, this is going to be the place. Put your beds down.”) was not coded as an initiation because, in the role of Foreman, Dan was required to tell the others where to set up their beds (see Table 4 for an example of how initiations were coded).

Variables other than rates of initiations were incorporated because, although initiations are commonly used as a measure of social competence (e.g., LeGoff, 2004; Matson, Matson, & Rivet, 2007), initiations are only part of a diverse and shifting definition of socializing and do not capture the complexity of interactions between the individuals and the environment (Conn, 2014).

Level of engagement was measured according to the analysis of 30-second intervals of the video clips. A boy’s engagement during a 30-second interval was rated as engaged or disengaged based on whether or not he was socially engaged for 15 seconds or more of the interval (Koegel, Kuriakose, et al., 2012). Engagement was defined as appropriate pragmatic social behaviour such as facing peers, making eye contact, gesturing, responding to questions, asking questions, making comments, smiling, nodding, or sharing of activities or materials with peers (Koegel, Matos-Freden, et al., 2012). Some of the characteristics typically used to measure level of engagement in similar studies were not meaningful during the interactions in a virtual environment (e.g., eye contact) and were replaced with characteristics of engagement that were more meaningful in the virtual environment (e.g., shared joint attention of two avatars within the game).
Table 4

*Example of Coding for Initiations*

This exchange happened while building a tree house during Session 5. As the Architect, the adult agreed with Dan’s suggestion to build a “little luxury home in a tree.” Even though each player had his own area to develop, Dan and Peter shared ideas comfortably.

<table>
<thead>
<tr>
<th>Line from transcript</th>
<th>Initiation</th>
<th>Exclusion factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dan: I think mine looks good guys.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I’m going to work on the bedroom.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Put a couple of beds here.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td><strong>I’ll use the dark oak, Peter?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td>2. Peter: Pardon?</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td>3. Dan: <strong>Do you want to know how to make a TV?</strong></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4. Peter: It doesn’t matter.</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td>5. Dan: I’m making a TV in my room.</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td>6. Adult: How do you make a TV?</td>
<td>N</td>
<td>3</td>
</tr>
<tr>
<td>7. Dan: Just a painting.</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>It’s a painting on the seat.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>See here’s my TV.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Creeper News Channel</td>
<td>N</td>
</tr>
<tr>
<td>9. Dan: That’s my large chest.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>10. Peter: Yes! Just enough spaces.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>11. Dan: Uh-oh.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>12. Peter: “Peter-saurus” lives [incomplete statement]</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>13. Dan: Put a furnace here.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Bookshelves [showing Adult]</td>
<td>N</td>
</tr>
<tr>
<td>14. Peter: Beware.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>15. Dan: Right I’m building a quick little room with another chest down. Make a desk.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>17. Adult: I think of my computer.</td>
<td>N</td>
<td>3</td>
</tr>
<tr>
<td>18. Dan: Are we done here?</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>19. Peter: I think we’re done. I think we should move on.</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td>20. Adult: I think we should grab a picture of this one.</td>
<td>N</td>
<td>3</td>
</tr>
<tr>
<td>21. Dan: I’ll just finish off one thing in my room.</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>22. Adult: All right.</td>
<td>N</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Not clearly directed at peer. 2. Not a spontaneous utterance (response). 3. Said by adult or typically developing peer. 4. Spoken as part of Foreman’s responsibility (prompted by role)
The affect of the boys during social engagement was coded using a rating scale designed for this purpose (0-1 negative, 2-3 neutral, 4-5 positive; Koegel, Kuriakose, et al., 2012; Vismara & Lyons, 2007). Affect and engagement were coded based on the boys’ behaviour on characteristics such as attention to task, responsiveness to prompts, emotional behaviour, and compliance (Koegel & Egel, 1979).

**Analysis**

Three levels of analysis were used to explore the social interactions and the changes in social competence of the boys with ASD. The first level of analysis focused on the changes in social behaviour as measured by the coded variables (i.e., rates of initiations, levels of engagement, affect). Video recordings of the entire sessions were viewed and coded in random order. There was no reliability calculation because the variables were coded by one person (i.e., rates of initiations were coded by the researcher, level of engagement and affect were coded by an independent research assistant). While coding, the coders observed video recordings of the sessions, followed along with the transcript, and continuously referred back to the definitions of the coded behaviour. Video recordings of the in-person interactions were used primarily for coding; video recordings of the in-game interactions were used secondarily, when they were necessary to understand a particular in-game interaction (e.g., shared in-game attention). Each video recording was viewed and coded three times for each boy in the video, so that each variable could be coded individually for each session.

The second level of analysis focused on changes in group and individual social behaviour beyond the social behaviour measured by coded variables (e.g., quality of social play, problem solving, rates of verbal utterances, percentage of partial statements). The third
level of analysis focused on the extent to which changes in social behaviour aligned with the subscales of the SRS-2. A three-step strategy was used to analyze the data (i.e., video recordings, audio recordings, and transcripts of the sessions) to establish the type of interactions (e.g., tone, purpose, type of sentence) and quality of interaction (e.g., level of cooperation, collaboration) for the second and third level of analysis. First, the video recordings were watched in order, and observational notes were taken. Second, using the observational notes and transcripts of the sessions, a narrative order of events was written to describe interactions during Structured Play (e.g., objectives, role-based tension, key statements) and Free Play (e.g., play choices, initiations, co-operative play). Third, interactions of the boys were analysed in light of each boy’s social profile using the narrative document. The original data (e.g., video recordings and transcripts) were referred back to at every step of the analyses.

Close analyses of video recordings and transcripts are not often conducted to measure social engagement during play-based activities of youth with ASD, even though they have been used to describe other learning processes (e.g., reciprocal teaching, Palincsar & Brown, 1984) and have been identified as a valuable strategy for learning more about social exchanges of youth with ASD (Bauminger-Zviely, 2013).

Results

Rates of Initiations

The boys made few initiations (spontaneous, peer-directed utterances) during the pre-session when participating in Non-play and Free Play (see Figure 5). When they started the Structured Play in Session 1, their rates of initiations (0.40) doubled the rates of initiations during the pre-session Free Play (0.19) and Non-play (0.16). These rates during Structured
Play Sessions 1-6 remained higher than pre-session levels. This finding suggests that Structured Play can be used to boost the quality of social play. The average rates of initiations remained steady over the sessions, remaining between 0.4 and 0.53, which suggests that the rates of initiations during socially interactive play among 3-4 people is limited by a ceiling effect and may not naturally extend beyond optimal levels. While higher rates of initiations generally signal an increase in someone’s desire to interact with others, too many initiations may obstruct the give-and-take necessary for naturally flowing social interactions.

Figure 5. Rates of initiations during three play types.

While rates of initiations during Free Play were low during the early sessions (e.g., 0.27, Session 1), the average number of youths’ initiations increased over the span of the sessions. By Session 6, the youth initiated more in Free Play (0.52, Session 6) than Structured Play (0.47, Session 6). This finding suggests that, as the youth practiced making initiations during Structured Play, they transferred the skills to Free Play.

The rates of initiations made during Free Play generally increased from pre-session to Session 6, but declined sharply during the post-session. The declines were likely
influenced by technical difficulties and therefore should not be necessarily interpreted as evidence of less social play. During the post-session, the youth decided collectively to play together on the same server. Of their own volition, they spontaneously stood up from their seats and arranged themselves in a large circle, shifting the seats so they could face each other and play on the single server. Unfortunately, the multiplayer server could only support five players at a time, so Internet connections were inconsistent. Rather than interrupting the play and requiring that the adolescents return to groups of 3 and 4, the play was allowed to continue because their shared pleasure was clearly observable in that they played together as a group and had sought each other out for play (e.g., “Walk down and I’ll start the ladders,” “Let’s build a bunker,” “Want to go blow something up?”).

**Initiations during Structured Play.** The variations of individual rates of initiations may be partially explained by the composition of the groups. For example, Dan’s rates of initiations dropped when he was part of a group with the adult volunteer named Mark (sessions 1, 3; see Figure 6). Mark’s facilitation style was assertive and verbal, so it is possible that Dan did not feel the need to initiate as often. Enoch also had an effect on the other youth. When part of a group with Enoch, Oliver (Sessions 2, 5) and Peter (Sessions 3, 6) initiated less often than they did in previous sessions. Like Mark, Enoch’s social play was highly verbal. The effect of Enoch’s presence on the others should be interpreted carefully. Even though the others initiated less when grouped with Enoch, it is not necessarily true that Enoch was a detriment to the socializing of the group. Enoch’s social play improved quite a bit over the sessions and his ability to anticipate needs, check in with others, and coordinate plans meant that the other youth might not have needed to initiate as often.
Figure 6. Rates of initiations during Structured Play.

Not all changes in rates of initiations were related to group composition. For example, Oliver’s high rate of initiations during Session 4 may reflect his interest in the first objective task, which was to build a house in the shape of a whale. Oliver was the Architect for the whale-house task and seemed very enthusiastic about the challenge of making the whale’s water spout. Of the initiations Oliver made during the three tasks during Structured Play that session, he made more than half (59%) during the whale-house task.

**Initiations during Free Play.** During Free Play, the youth were not required to interact so rates of initiation were high for youth, like Dan, who sought out others to play (social motivation) and who were effective at engaging others in play (social competence). Rates of initiations were low during sessions when youth built individual tasks but engaged in conversation, or when youth built shared tasks but didn’t engage in conversation (see Figure 7). During Free Play sessions when youth played alone and ignored the others, the rates of initiations were very low. As demonstrated by the increase in Free Play initiations, over the sessions the youth improved in their social motivation and social competence, criteria of the SRS-2.
Dan consistently sought out other youth to play during Free Play. While Dan actively recruited others to play during all Free Play sessions, his attempts to engage with others were more successful during the later sessions. By Session 4, Dan’s attempts to engage with others might have been more successful because he used the interests of the others to initiate play.

For Oliver and Peter, after the effortful experience of Structured Play, Free Play was an opportunity to build their preferred buildings. Oliver tried to incorporate others into his building projects (e.g., “Hey guys! Come check this out!” Session 3), but was not very successful until Session 6, when he was grouped with Dan. During Session 6, Oliver used the youths’ names and interacted with them according to their projects (e.g., “Dan, there won’t be much of a roof any more”). Peter generally played alone during Free Play, but he built his projects in closer proximity to the others with each session of Free Play. During the early sessions, Peter ignored the other youth and interacted only when he wanted an audience. During Sessions 3-6, Peter still built his own task, but he responded to the conversations and answered questions more often. During Sessions 5 and 6, Peter joined the others when he finished his task.
During Sessions 1 and 2, Enoch played alone. During Sessions 3 and 4, Enoch sought out interactions with other youth by finding them at different servers and sabotaging their work; he often sent rivers of lava pouring over their completed tasks. This strategy was not well received by the others. By the later sessions, Enoch found more effective ways to interact with the other youth (e.g., he built a dance hall and invited others to dance with him, Session 5).

**Initiations during Non-play.** During the pre-session and post-session, the youth were asked to talk together in small groups about topics of interest. The youth made more initiations during the post-session than during the pre-session (see Figure 8). During the conversations in the pre-session, the youth mostly spoke when asked a direct question by an adult and spoke very little to the other youth. The conversations in the post-session were much more interactive. During the post-session, the youth mostly spoke to each other (see Figure 8 for level of engagement scores). There was not much change in the affect scores between the pre-session and the post-session; the youth enthusiastically participated in both conversations (see Figure 8 for affect scores). The finding that rates of initiations and levels of engagement increased over the intervention suggests that, as the youth practiced making initiations during Structured Play, they were able to transfer the skills to Non-play.

![Figure 8](image.png)

**Figure 8.** Rates of initiations, level of engagement, and affect during Non-play.
Level of Engagement.

Structured Play and Free Play. For most of the Structured Play sessions, the youth had high levels of engagement (generally higher than 0.6; see Figure 9). During Free Play, the youth engaged with each other less than when in Structured Play probably because, when not forced to co-operate, the youth were free to choose solitary tasks. Overall, the youth engaged with each other more during Free Play in the later sessions than they did during the early sessions. The low level of engagement during Free Play in the post-session may be related to technical difficulties, as described earlier.

![Figure 9. Level of engagement during three play types.](chart.png)

Much like the variation of other variables, the range of the youths’ levels of engagement may be related to group composition (see Figure 10). Dan and Oliver enjoyed working with each other, and their levels of engagement were high when they were together (Sessions 3 and 6). When playing with Peter, who generally preferred playing alone, the other youth tended to be less engaged during Free Play. For example, Dan (with Peter in Sessions 2 and 5) and Oliver (with Peter in Sessions 1 and 4) were much less engaged because their attempts to engage play with Peter were not well received. While the effects of
Group dynamics (e.g., high engagement with Dan, low with Peter) can also be observed in Structured Play, the effects were much less dramatic. These findings suggest that participation in Structured Play may mitigate some of the effect that group dynamics and personality preferences have on social engagement.

Figure 10. *Levels of engagement during Structured Play and Free Play.*

**Affect**

**Structured Play and Free Play.** Rates of affect were positive (>3) during Structured Play and Free Play (see Figure 11). The youths’ scores of affect during Non-play were higher in the post-session than in the pre-session. These findings suggest that the youth enjoyed the intervention, both in Structured and Free Play. The low affect score during Free Play in the post-session may be partially explained by the technical difficulties, as explained earlier.
Figure 11. Level of affect during three play types.

Analysis of the affect scores must be done carefully because the differences between affect scores during Structured Play and Free Play are very small (see Figure 12). The youths’ average affect scores were slightly higher during Free Play than during Structured Play. Of the three variables (i.e., initiations, engagement, affect), affect was the only variable that was higher during Free Play. The inverse relationship between social interaction variables (i.e., rates of initiations, levels of engagement) and enjoyment variables (i.e., affect) suggest that being required to socialize, while still being enjoyable, was effortful for the youth. The variation in the youths’ affect scores across sessions was wider during Free Play than during Structured Play, as was observed for the variables of rates of initiations and level of engagement. This finding suggests that Structured Play mitigates the influence of factors (such as group dynamics and type of task) may negatively impact the quality of the youths’ social play.
Figure 12. *Rates of affect during Structured Play and Free Play.*

**Group Development**

While the variables of rates of initiations, level of engagement, and affect provide a view of the changes in the social play of the youth, a close inspection of the youths’ interactions reveals levels of development beyond the scope of the variables. The changes in the rates of initiations, for example, mirrored changes related to more complex development, such as the effectiveness of interactions and the richness of social play. Even though the stable rates of initiations during Structured Play might suggest that the youths’ development stopped improving, the youth interacted more, and the quality of their play became richer, over the course of the sessions.

The youths’ social play during the early sessions was often parallel and associative, while, during the later sessions, the play was often co-operative. According to Parten (1932), the differences among parallel, associative, and co-operative play are meaningful in a variety of settings. Parallel play occurs when two or more people are playing in proximity to each other without directly interacting or combining their play activities. Associative play occurs
among people who are interacting together, but are not playing together directly. Co-operative play occurs when two or more people engage with each other during play, actively involving the others in play decisions and activities. During the early sessions, the youth preferred to engage with each other as little as possible. The youth often designed the early objectives so that each person had his or her own space and work tasks. For example, the task of the bonfire (Session 1) was designed so that each youth had a separate job (e.g., build seats, clear land).

The youth may have preferred parallel play during these early sessions because individualized workload meant that the youth did not have to negotiate space or work together directly. During the early sessions, the youth avoided each other and tended to see each other as obstacles to accessing their preferred tasks and resources. The parallel and associative play during the early sessions was exemplified by the following incident, which happened during Session 2. As Foreman, Dan could not directly contribute to the design of the task of building a platform in the clouds and could not, therefore, mandate that his favourite building project (houses) be included. Peter’s plan for the platform was to build oversized letters on the platform (e.g., D for Dan, P for Peter). Dan repeated his suggestion, at times interrupting Peter, until the adult, in the role of Artist, included house design as a decoration of Dan’s letter. While building the platform task, Dan abandoned the task of building his letter, as per Peter’s design, and started building his house saying “I know it doesn't look much like a D but I'm gonna do this. I'm gonna build a house. Don't mind me, I'm going to build a house.” Dan continued working on his preferred task, stopping only to tell Peter that he was obstructing his work: “Dude, your glow stone is in my way.” Dan’s behaviour and statements were typical of the youth during the early sessions and
demonstrate that the youth tended to focus on personal preferences and to see each other as obstacles.

The youths’ play during the later sessions was much more social and co-operative than the early sessions. In the later sessions, the youth sought each other out for play experiences and less often saw each other as obstacles to their individual play. The youth used what they knew about each other’s preferred activities (e.g., Peter loved mine carts) to initiate play activities. During the later sessions, the youth commonly refrained from their favourite activities and played the favourite activity of another youth instead (e.g., “Want to join me? I’m going to put pigs in a mine cart and make them go down a mountain”).

**Individual Development**

While group-wide observations of the quality of the youths’ social play provide a general view of the youths’ collective social development, specific observations of individual development reflect the unique social profiles of the youth. As demonstrated by the SRS-2 and conversations with their families, the youth in the present study had different social strengths and faced different social challenges. Each youth made developments across the social criteria, but the most salient gains aligned with the social challenges identified as problematic for each boy at the onset of the sessions.

**Enoch.** Enoch’s parents reported that he had difficulty solving problems with others because he did not fully understand what others were saying. His parents’ goals for him included the development of the skill of “give and take,” which they considered necessary for social interaction. During the early sessions, Enoch demonstrated the types of behaviours described by his parents. Enoch ignored the other youth, focused on his preferred items, and, when forced to interact in the role of Foreman, gave vague instructions. Of the five
subcategories of social deficits described by the SRS-2, Enoch’s behaviour demonstrated weakness in social communication (e.g., provided ineffective instructions), social motivation (e.g., appeared apathetic to other youth), and autistic mannerisms (e.g., perseverating on a favourite object).

During the early sessions, Enoch engaged with the other youth mostly when trying to impress them with his knowledge of the game (e.g., training a dog, “Great! I’ve done it! I’ve tamed a dog” Session 1). Enoch avoided working with the other youth, deliberately isolated himself from the group, and focused on playing with diamonds, his favourite resource block. During the early sessions, Enoch’s behaviour and verbalizations (e.g., “diamonds! diamonds! diamonds!” Session 1) distracted and obstructed the socialization of the other youth. While building the task of a bomb shelter, Enoch answered direct questions with nonsensical answers. For example, to the question “Do we need beds?” Enoch answered “I love diamonds.” When asked, “Where are we going?” Enoch answered “I am the Diamond King.” A portion of such an interaction is shown in Table 5.

As the sessions went on, Enoch preferred co-operative play over individual or parallel play. He contributed to conversations and, at times, asked for clarification. He tried to encourage other youth. During Sessions 5 and 6, Enoch praised the other youth (e.g., “Yeah, that’s a good idea,” “Everyone did a great job,” “You’re doing such a great job on the roof!”). As Enoch’s interest in the other youth and the objectives developed through the sessions, he became less distracted by diamonds. By the later sessions, Enoch avoided diamonds entirely. During Session 5, Oliver chose diamonds as a resource for the task of building a railroad. As the Foreman for the task, Enoch decided to let others build with diamonds. Again, in Session 6, the group’s plan to build a baseball diamond included
extensive use of diamond blocks. Instead of building with diamonds, Enoch chose to avoid the resource entirely. An example of later interactions is also shown in Table 5.

**Table 5**

*Examples of Enoch’s Interactions*

This exchange during Session 1 is an example of Structured Play between an adult; Lindsay, the typically developing peer; Enoch; and Dan, wherein the group worked on their objective of decorating a cave. Enoch became so excited about placing diamonds that he disrupted conversation and did not co-operate with others.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dan: Where do you want the water?</td>
</tr>
<tr>
<td>2.</td>
<td>Lind.: Right next to the. Yeah right there. And maybe more than a few because it said to make it ginormous.</td>
</tr>
<tr>
<td>3.</td>
<td>Dan: Where do you want the diamonds?</td>
</tr>
<tr>
<td>4.</td>
<td>Adult: Were we supposed to put something at the bottom to trap it?</td>
</tr>
<tr>
<td>5.</td>
<td>Lind.: Yes, we definitely should do [incomplete statement]</td>
</tr>
<tr>
<td>6.</td>
<td>Enoch: Diamonds! Yay! Diamonds, diamonds, diamonds!</td>
</tr>
<tr>
<td>7.</td>
<td>Lind.: Okay, leave at least one block away from the water because we need [incomplete statement]</td>
</tr>
<tr>
<td>8.</td>
<td>Enoch: Diamonds, diamonds!</td>
</tr>
<tr>
<td>9.</td>
<td>Dan: We can put it along the sides so it is nice.</td>
</tr>
<tr>
<td>10.</td>
<td>Lind.: Glow stone should be there.</td>
</tr>
<tr>
<td>11.</td>
<td>Dan: Okay, water is coming down, so be careful.</td>
</tr>
<tr>
<td>12.</td>
<td>Adult: Yeah, be careful.</td>
</tr>
<tr>
<td>13.</td>
<td>Dan: I’m going to get the water so be careful. How’s it coming down there with the barrier?</td>
</tr>
<tr>
<td>14.</td>
<td>Lind.: Oh it’s going good. I’m working hard on it.</td>
</tr>
<tr>
<td>15.</td>
<td>Dan: I’m going to shove down the cake. Little bit of cake here and here.</td>
</tr>
<tr>
<td>16.</td>
<td>Enoch: Diamonds, diamonds!</td>
</tr>
</tbody>
</table>
This exchange during Session 6 is an example of Structured Play between an adult, Enoch, Peter, and Dan, wherein the group worked on their objective of building a baseball diamond. Not only did Enoch avoid placing the diamonds (Peter did it instead), he asked questions, clarified meaning, and co-operated with others.

1. **Enoch:** I’m going to follow you. Oh look! A nice jungle biome. Oh my, it’s so hot in here.
2. Adult: Okay, we need to fill it all in.
3. **Enoch:** Should we do it on a grass area?
4. Adult: That’s emerald.
5. **Enoch:** I’ll go get the grass blocks.
6. Peter: I’m going to build the actual, the actual diamond.
7. Adult: Is there not a place that is more flat?
8. **Enoch:** There is a different place that is more flat. If you look carefully and look down.
9. Adult: So, are we going to dig out what we are building out?
11. Adult: So we’re going to dig it all out?
12. **Enoch:** Yeah, let’s do that. Great idea!
13. Peter: And then this whole area is going to be emerald.
14. **Enoch:** Okay, great idea. You’re a genius.
15. Adult: Make sure you share what you are thinking.
16. **Enoch:** Do I put grass here? Put the grass?
17. Peter: Where glass?
18. **Enoch:** No. Grass.
19. Peter: Oh, it’ll have to be behind. Once we build the baseball diamond, then we’ll know where to build the grass.

**Dan.** Dan’s mother reported that Dan’s abilities to socialize and co-operate effectively were limited by the difficulty he had understanding the perspectives of others. She said that Dan was self-interested and was less able than typically developing peers to pick up on social cues. Her goal for Dan’s development was that he could “listen to others and really understand them.” During the sessions, Dan demonstrated the type of behaviours described by his mother. Of the five SRS-2 categories, Dan demonstrated weaknesses in social communication (e.g., did not communicate intentions) and social motivation (e.g., prioritized his own building goals over the goals of others).
Dan was particularly self-focused at the start; he pushed for his favourite type of building task (i.e., building houses). In the role of Foreman during early sessions, Dan imposed his vision on others even when he had to contradict the Architect’s design (see Table 6). When he wasn’t in the role of Foreman during the early sessions, Dan forced his vision on the group task. Dan used a constant stream of requests and clarifications to ensure his goals were included in designs. During Session 3, even though Dan’s question “Foreman, do you want cake?” was answered (“no”), Dan continued to ask “Everyone want a cake? Cake?” When he did not get his way, Dan ignored the roles and did what he wanted. For example, even though Dan was not the Foreman for the bonfire task (Session 2), Dan insisted on the need for more fireside seating. The adult asked Peter, “Do you want Dan to do that?” Without waiting for the Foreman’s permission, Dan replied, “I’ll just go ahead and do that.”

Over the sessions, Dan showed improvement in his social communication and motivation to work with others. By Session 4, Dan’s comments were less often related to his own goals and were more often connected to the group’s objectives. He began to seek affirmation from the Foreman (e.g., “Is it okay if I make the ladder with two blocks?” “Are you okay if I use red wool for the walls?”). When working with Peter during Session 5, Dan’s interest in working with others was put to the test during a relatively complex task. Rather than doing what he wanted or barraging others with requests, Dan tried to understand Peter’s position, while explaining his own. Note also that the discussion was almost entirely between the two youth. Unlike the Session 2 discussion (see Table 6), which was resolved through adult intervention (statements 9, 12, 14), the discussion in Session 5 was resolved between the two boys; the only statement made by the adult (statement 6) is unrelated to the
overall tension. Although these examples included only Dan and Peter, it was true for all the
boys that the duty of facilitating communication shifted from the adults to the boys
themselves over the span of the sessions.

Table 6

Examples of Dan’s Interactions
While planning the platform task in Session 2 (with Peter, Dan, and an adult), Dan managed
to get his favourite task (building houses) incorporated into the design.

1. Dan: Okay, so we want the platform first. Correct?
2. Adult: So, build a platform high up in the clouds.
3. Peter: So, it'll be easier, to get up there, we use a [interrupted statement]
4. Dan: I would say it would work, we could just fly up to adjoining platform.
5. Peter: [continued statement] A one-by-one platform all the way up.
6. Dan: Are we building anything after we get up there? A house would look kind of
   cool. Kind of cool. Don't you think? House?
7. Peter: We could maybe put the first letter of each of our names.
8. Dan: We could build a house. The roof. Maybe that will be good.
9. Adult: When you’re the Architect you can. Now he's the Architect and he'll decide.
   And then it will be your turn.
10. Peter: So we'll go P, J, and D on the top.
11. Dan: But, it's squares. I don't see how [incomplete statement]
12. Adult: Okay, I am the Artist so I'm going to make some decisions. So, I think the P
    should be made of glow blocks.
13. Dan: Glow stone?
14. Adult: Glow stone. Okay, we will make Dan’s D and put a house on top.
15. Dan: That'll look good!

The design of the waterslide task in Session 5 involved lava rivers and multiple streams of
water. Its implementation required a lot of negotiation between Dan (Architect) and Peter
(Foreman).

1. Dan: We have to block off a lot of area. I’m going to go ahead and start blocking.
2. Peter: Okay, so.
3. Dan: I think the slide should come off here, eh? So, it’s clear.
4. Peter: I think right here.
5. Dan: Yeah, right here is obvious. Could you stand where you want it?
6. Adult: Good idea, Dan.
7. Peter: Right here, perfect!
8. Dan: I think I [incomplete statement]
9. Peter: Well, I want the top, but it is going to continue on.
10. Dan: I think you should block off so it starts.
11. Peter: It starts [incomplete statement]
Dan: Where do you want the lava? I’m the Architect so I think the lava should be coming off the mountain by that pool.

Peter: So that it is pouring towards you?

Dan: No, you go over it and you think it is going to fall.

Peter: How will you make the water launch you over?

Dan: You go over the lava, you keep going with another jet of water, okay? So, I’m going to [incomplete statement]

Peter: I don’t really understand what you mean.

Dan: I’m blocking off the points for the lava. The lava is going to come, like right [pause] Right [incomplete statement]

Peter: Can you show me with your iPad?

Peter. Peter’s parents reported that Peter was socially apathetic and was not likely to initiate social exchanges. His mother said that, if other youth approached Peter to play, he would play, but Peter did not extend socially to others: “He doesn’t initiate that.” According to the SRS-2, Peter’s social awareness was severely restricted. Also, his development was moderately restricted in terms of his social communication, social motivation, and autistic mannerisms. During the sessions, Peter demonstrated weakness in his social communication (e.g., low verbal communication) and social motivation (e.g., preferred to play alone when possible).

During the early sessions, Peter spoke only when he had to. When working in the role of Artist and Architect during the early sessions, Peter answered direct questions and participated in conversations directly related to the building task. By the later sessions, Peter was much more engaged with the other youth. During Session 1, 91% of Peter’s verbal exchanges were responses to direct questions (10 of 11, e.g., “I’m building a house on top.”). During Session 5, the percentage of his verbal exchanges that were responses to questions dropped to 46% (13 of 28). During Free Play, Peter spoke more during the later sessions than the early sessions (e.g., 8.75 words per minute [wpm], Session 1; 15.48 wpm, Session 4). During Session 5, Peter also asked unprompted follow-up questions (“Are you sure
you’re able to do that in [this] version?”), initiated statements (“If you did that in survival
mode, you would have killed yourself.”), and engaged in general discussions about his
preferred tasks (see Table 7 for an example of an exchange). During the later sessions, Peter
used more imaginative language (e.g., “We could kind of pretend we’re playing baseball.
You could throw a snowball at someone and they could hit it,” Session 6) and contributed to
conversations unrelated to the task (e.g., to Enoch, who asked how the Minecraft™ avatar
could possibly sleep so quickly, Peter replied, “Some people who are really tired go to sleep
once they touch their head to the pillow.”).

Table 7

Examples of Peter’s Interactions
During Session 1 Free Play, Peter only spoke to the adults and ignored Oliver’s statements,
even when asked direct questions. Eventually, the Adult responded and conversed with
Oliver. When Peter spoke, he used simple statements to answer direct questions.

<table>
<thead>
<tr>
<th></th>
<th>Adult: Do you want to stay in this world or leave?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oliver: Let’s hang out in this world.</td>
</tr>
<tr>
<td>2</td>
<td>Adult: We can build or do whatever we want.</td>
</tr>
<tr>
<td>3</td>
<td>Oliver: Okay, let’s hang out in this one.</td>
</tr>
<tr>
<td>4</td>
<td>Peter: I’m going to build a house on top of the mountain.</td>
</tr>
<tr>
<td>5</td>
<td>Oliver: Ah, how should this be? There should be a ladder so I can climb up.</td>
</tr>
<tr>
<td>6</td>
<td>Adult: Okay.</td>
</tr>
<tr>
<td>7</td>
<td>Oliver: The house should be connected to the cave.</td>
</tr>
<tr>
<td>8</td>
<td>Adult: Why don’t we do that?</td>
</tr>
<tr>
<td>9</td>
<td>Coord.: The time is done for the objectives.</td>
</tr>
<tr>
<td>10</td>
<td>Adult: We just finished.</td>
</tr>
<tr>
<td>11</td>
<td>Coord.: Okay great. Let me do your stickers.</td>
</tr>
<tr>
<td>12</td>
<td>Adult: Okay.</td>
</tr>
<tr>
<td>13</td>
<td>Coord: Peter, here is your last [sticker].</td>
</tr>
<tr>
<td>14</td>
<td>Adult: We crushed it, guys. What were you thinking Oliver? Building a ladder on the top?</td>
</tr>
<tr>
<td>15</td>
<td>Peter: I’m building a house on top.</td>
</tr>
<tr>
<td>16</td>
<td>Oliver: I’m just going to start making my way up, with blocks. I should be able to make it. Like that and that. I hope there’s no gravel. No gravel! Oh! The lights. And, okay I’m just going to [incomplete statement]</td>
</tr>
<tr>
<td>17</td>
<td>Adult: Does glow stone actually glow?</td>
</tr>
<tr>
<td>18</td>
<td>Peter: Yep.</td>
</tr>
</tbody>
</table>
During Free Play in Session 5, Peter conversed freely with Dan about building digital clocks. Unlike earlier sessions, Peter answered Dan’s direct questions.

1. Dan: Peter, are you building something?
2. Peter: I’m building a digital clock.
3. Dan: What’s the purpose of that?
4. Peter: What’s the purpose of mining in creative?
5. Dan: It’s fun.
6. Peter: Well, there you go. Well, that’s the purpose.
7. Dan: How are you doing that? There’s no red stone.
8. Peter: It doesn’t click. It just looks like it.
9. Adult: The stuff that doesn’t light up is made of wood, isn’t it?

**Oliver.** Oliver’s guardians reported that he was easily overwhelmed by situations and had difficulty advocating for himself. As a result, Oliver’s guardians said that he was “very quiet and [didn’t] mix too much” with others his age. Oliver’s guardians’ perceptions of Oliver’s social challenges were confirmed by the results of the SRS-2 and his behaviour during sessions; Oliver’s social communication and motivation were moderately restricted.

During the early sessions, Oliver had a hard time initiating and sustaining social exchanges with others. The other youth were often confused when talking with Oliver because Oliver commonly narrated his actions without a clear audience (e.g., “I’m starting with the pole. I wonder how high it is going to be.” Session 1), while, at other times, Oliver chose a topic unrelated to the task at hand. Oliver’s communication during the early sessions was characterized by partial and unclear statements. During the early sessions, Oliver commonly spoke in low tones and repeated partial phrases to no one in particular (e.g., “I’m going to look for, yeah, we could make a little, okay, hold on, so, when it goes under,” Session 1). During Session 1, Oliver’s attempt to engage the other youth in discussion about math formulae was not successful. It was not clear to the other youth whether Oliver was speaking with anyone in particular or why he was talking about those topics (see Table 8).
Over the sessions, Oliver improved the clarity of his conversations by speaking more often and reducing the number of incomplete statements. Oliver’s rates of verbal exchanges that included incomplete statements dropped from Session 1 (21 of 129, 16.28%) to Session 6 (14 of 220, 6.36%).

As the sessions went on, Oliver did a better job participating in purposeful interactions with a clear audience. While building an art gallery in Session 5, Oliver felt that the design put him at a disadvantage because the four walls of the art gallery were not equal. Oliver was able to express his fears that he would have the smallest wall to decorate by saying “My area is pretty small” and “I have the worst area in the museum.” During the later sessions, Oliver communicated effectively and consistently with the other youth (see example from Session 6 in Table 8). Oliver was able to make building decisions with Dan (e.g., number of doors for the potato house, statement 1), respond appropriately to Dan’s queries (e.g., no roof because of time, statement 13), and use imaginative language (e.g., “potatoness!” statement 6).
Table 8

Examples of Oliver’s Interactions

Oliver’s attempt to engage the others in conversation in Session 1 was weakened by incomplete statements, unclear directives, and a topic of discussion (i.e., math formulae) that were unrelated to the task at hand (i.e., building a roller coaster).

1. Adult: What do you want us to do, Peter?
2. Peter: I want you guys to go up and do the wood around.
3. Oliver: Okay.
4. Peter: I’ll do the underground part.
5. Adult: Like this?
6. Peter: Yep. Use power-rails so it makes it easier.
7. Oliver: It’s going to be like [incomplete statement]
8. Adult: What’d you say Oliver?
9. Oliver: It’s going to be like stone for the wood.
10. Adult: Okay, I saw a piece of wood there.
11. Oliver: Whoa, ran out of track.
12. Adult: What kind of stone?
13. Oliver: Regular stone.
14. Adult: Cobblestone?
15. Oliver: Regular stone, not cobblestone.
16. Peter: It’s just the flat stone.
17. Adult: Oh, it just says stone.
18. Oliver: Wait that, oh, oh, um. I’m just going to start. [pause] I’m just going to make the length.
19. Adult: Good idea.
20. Oliver: Length, times width, times height.
21. Adult: Power rails make it go up?
22. Oliver: Yeah, figure out the area of a triangle. It’s base times height times 2. It’s half a square or a rectangle.
25. Adult: Do we want it to go higher?

During Session 6, Oliver and Dan worked together to build their project: a potato-shaped house for a pig. The conversation was typical of Oliver’s exchanges during the later sessions because it included reciprocal exchanges between the boys on a shared topic.

1. Dan: Let’s work on the house.
2. Oliver: Yeah, let’s make it small with two doors.
3. Dan: Oliver, do you want to [incomplete statement] I’m just using the base.
4. Oliver: I’ll just get the doors open. Build them open.
5. Dan: I’m building the potato.
6. Oliver: Potatonesse!
7. Lind.: When it’s Free Time, you can keep going, I’m going to go build something else.
8. Dan: I’m going to play with TNT.
9. Oliver: Let’s make the whole thing.
10. Dan: Let’s just build the house.
11. Oliver: Two blocks high so we don’t have far to jump.
12. Dan: Do we need a roof?
13. Oliver: Nah, it’ll just slow the time down.
15. Oliver: We’re not done.

**Development and SRS-2 Criteria**

The SRS-2 is an objective measure of the social characteristics associated with ASD (Constantino & Gruber, 2012), so it provides a useful framework for observing social development during the sessions. The SRS-2 measures characteristics from a broad spectrum of social behaviour, so not all of the items were relevant to the social play during the present study (e.g., there was no opportunity for youth to “wander aimlessly from one task to another”). Even though not all the characteristics measured by the SRS-2 were present in the study, the youth demonstrated deficits and development in line with its five criteria: social awareness, social cognition, social communication, social motivation, and restricted interests and repetitive behaviour.

The criterion of social awareness describes the sensory aspects of reciprocal social behaviour, including the youths’ abilities to pick up on social cues (Constantino & Gruber, 2012). When playing in the role of Foreman, the youth had to be aware of what others were thinking or feeling to give effective instructions. During the early sessions, the youth tended to give inadequate and inappropriate instructions in the role of the Foreman. For example, when choosing a location in the virtual environment to play during Sessions 1 and 2, Enoch ran ahead of the others and gave vague instructions (e.g., “Now you, you are going to decorate it. Yeah, you!”). Enoch did not understand that his actions and instructions frustrated the other youth. During the later sessions, the youth gave clearer instructions and
checked for comprehension. As the Foreman in Session 5, Enoch waited for the others and gave specific instructions to the team: “Mark, you help with torches. Oliver, you need to, you will spawn the chickens and make the coop. Lindsay, you help with the torches and diamonds.” By being aware of the comprehension of others, the boys gave better instructions during the later sessions.

Social cognition describes the cognitive aspects of socializing, such as interpreting and processing social cues (Constantino & Gruber, 2012). The ability to interpret each other’s tone of voice and facial expressions was crucial to maintaining cohesive interactions. The play during Free Play was generally volatile and unpredictable; the youth played together sporadically; they joined play circles and then separated without notice. The youth worked together to build and, at other times, used explosives and lava in the virtual environment to destroy the landscape and buildings. Deciding when to build and destroy the building projects required constant negotiation. At times, the youth were happy to join the demolition (e.g., “Can I blow up the toilet?” “Yes, it must go!”), while, at other times, they pleaded with one another not to destroy their work (e.g., “No! Please stop lighting my stuff on fire.”). The interactions during early Free Play sessions were tense because the youth did not work to understand each other’s social cues. For example, while the youth were working together to demolish a mountain in Session 3, Dan accidentally set the TNT charges too early, thereby excluding Lindsay from participating in the coordinated explosion. Even though Lindsay used a disappointed tone of voice, Dan did not understand her reaction. By the later sessions, the youth were better able to process social cues. In Free Play in Session 6, Dan accidentally damaged the moat, a component of the objective task. By reading the body language of Oliver, Dan knew he should remedy the situation (i.e., “Whoops, I’m going to
fix it then.”). Dan’s choice to fix the damage he caused aligned with a general trend among the youth to infer each other’s feelings from tone of voice and nonverbal communication more often during the later sessions.

Social communication includes expressive skills, such as keeping up in a conversation, sharing feelings to others, and relating to peers (Constantino & Gruber, 2012). Participating meaningfully in the over-lapping and fast-paced conversations during the sessions (e.g., Structured Play 108.19 wpm; Free Play, 87.64 wpm) required that the youth follow the conversation, formulate their ideas, and interject as appropriate. It was difficult for youth with social communication challenges to keep up with the fast-paced conversation. When tensions arose during social play in the early sessions, the adults facilitated resolution using prompts (e.g., “follow the Foreman; the Foreman tells you who does what, remember?” Session 1). As the youth became better able to resolve conflicts, the adults had to intervene to resolve role-based tensions less often. Of the 279 times the adults spoke in Session 1, they were trying to resolve role-based tension 44 of the times (15.77%). In Session 6, the adults had to resolve tension between the youth much less frequently (i.e., 9 of the 287 times, 3.14%).

Social motivation describes the characteristics that influence the capacity to engage in social behaviour, such as anxiety, inhibition, and empathy (Constantino & Gruber, 2012). The youth were required to play together during Structured Play but, during Free Play, the youth engaged with each other only when they were motivated to do so. Dan was the most motivated to play with others during Free Play, while Peter was the least motivated. During the early sessions, Peter left the virtual space where the others were playing to find his own space to play. Even during the later sessions when the other youth would commonly choose
to integrate tasks and play together, Peter opted to play alone as soon as Free Play time arrived, often building his favourite task, a digital clock display, that he constructed out of dark and light blocks to simulate the LED display of a clock. Even though Peter continued to choose his preferred task during Free Play in the later sessions, he paid closer attention to the work of the others. He asked questions and contributed to the conversation. During Sessions 5 and 6, Peter rejoined the others after he had completed his preferred task.

Restricted interests and repetitive behaviour refer to the extent to which stereotypical behaviours and interests affect social competence (Constantino & Gruber, 2012). Stereotypical behaviours are repetitive body movements, such as hand-flapping, or verbalizations, that have no apparent function (Cunningham & Schreibman, 2008). Although Enoch exhibited some stereotypical behaviours (e.g., rocking, flapping hands) at certain points of excitement (e.g., Session 2 while building with his favourite resource block), repetitive behaviours were not common during the sessions. The youths’ development was most related to how well they could regulate themselves in terms of preferred items. Each of the youth had a favourite task or resource block. During the early sessions, the youth focused on finding ways to integrate their preferred tasks and resource blocks into the building tasks during Structured Play. The youths’ perseveration on preferred items and tasks disrupted social play during the early sessions, but, by the later sessions, the preferences had a different effect on play. Then youth used each other’s preferred interests as a way to connect, for example, when planning the tasks (as Architects) and decorating the designs (as Artists). For instance, when he was pressed for which materials he wanted to include in the design of the railroad for chickens, Oliver chose to include the preferred items of the other youth in his group, saying “I just want to think. [pause] We can have some parts with diamonds and then
pretty much some torches” (Session 5). Overall, the youths’ focus on preferred items was inversely related to their focus on each other; as the youth began to enjoy interacting with each other more, including their own preferred tasks and resource blocks was less of a priority.

**Discussion**

The findings of the current study extend the findings of previous research (e.g., LeGoff, 2004), demonstrating that Structured Play can help adolescents with ASD socialize, even though it may be effortful for them. When participating in Structured Play, the boys with ASD in the current study made more initiations and were more engaged than during unstructured play and conversation. Participating in Structured Play may improve social behaviours because participating in shared goals meant that the youth had to make and respond to social bids, a skill considered crucial to the development of social competence (e.g., Barakova et al., 2014; MacCormack et al., 2015). Structured Play activities may be particularly well suited for social skills interventions because the structure of the game play can be designed to mimic social rules (e.g., Baker et al., 1998; Wainer, Ferrari, Dautenhahn, & Robins, 2010). While the boys’ rates of affect remained positive throughout Structured Play, the rates of affect were slightly lower in Structured Play than in Free Play. The slightly lower rates of affect may signify that the additional requirements of Structured Play were effortful for the boys with ASD, a phenomenon noted in previous studies (e.g., MacCormack et al., 2015).

The boys’ abilities to make initiations and to be engaged socially with one another during Free Play and Non-play improved over the duration of the sessions. The social improvements of the boys suggest that social skills were transferred from Structured Play to
other settings. The inclusion of opportunities for skill transfer is important because what constitutes near and far transfers of skill should be identified early on in the research design process (Yamnill & McLean, 2001) and situations for near and far transfer should be included in measurement (Keinänen, Hetland, & Winner, 2000; Kim & Lee, 2001). While researchers who train youth with ASD to socialize often recognize the importance of translating social competence to new environments, many researchers do not include measurement tools to capture the rates and nature of far transfer (Koegel, Kuriakose, et al., 2012; Koegel, Vernon, Koegel, Koegel, & Paullin, 2012; Tzanakaki et al., 2014). Additionally, while follow-up assessments are sometimes conducted outside of social skills interventions (e.g., two-month delay, Koegel, Bradshaw, Ashbaugh, & Koegel, 2013), rates of generalization to other activities are often assessed only anecdotally (e.g., Koegel, Vernon, et al., 2012; Lord et al., 2005). Studies that collected rich data of social behaviour outside of the intervention, such as LeGoff’s (2004) play-based social skills study and the current study, are unique because they provide useful information about the effects of skill development on non-structured time.

As observed during Free Play in the early sessions, the low motivation of individuals with ASD to interact with others is a serious obstacle for effective socialization. The boys’ focus on preferred tasks (e.g., favourite tasks, Dan building a house; favourite resource blocks, Enoch’s diamond blocks) over interactions with other youth during the early sessions is a behaviour that has been associated with ASD from its initial discovery (Kanner, 1943). Researchers have used extrinsic reinforcers to increase motivation in socialization and have traditionally avoided interests because restricted interests are also characteristic of the diagnosis (e.g., Lovaas, 1987). This study extends the evidence that intense interests of
individuals with ASD are not obstacles to socializing, as once believed, but can be
meaningfully incorporated into interventions to improve social skills (Baker et al., 1998;
Boyd, Conroy, Mancil, Nakao, & Alter, 2007; Campbell & Tincani, 2011; Dunst, Trivette, &
Masiello, 2011; Otero, Schatz, Merrill, & Bellini, 2015). During the pre-session interviews,
all of the boys with ASD reported that playing the videogame Minecraft™ was an activity of
high interest and competence. When engaging with activities related to their interests, youth
tend to feel competent (even expert) at specific tasks. One of the ways that the boys first
connected during the early sessions was when they shared and demonstrated their perceived
areas of expertise. For youth with narrow interests and skills, the benefits of feeling that they
have expertise are considerable. When shared interests are used to increase engagement,
youth with ASD may be motivated to seek out social interactions instead of avoiding them
(Koegel, Bradshaw et al., 2013).

The findings of the current study imply that the roles and objectives for Structured
Play settings should reflect the developmental needs and abilities of the youth who
participated in the play. Unlike other Structured Play interventions that provided step-by-
step instructions (e.g., LeGoff, 2004), the youth in the current study had to develop their own
designs, which required problem solving and imaginative thinking. Working together to
design and implement the objectives required that the youth demonstrate symbolic play and
abstract thinking, which are skills appropriate for their age and developmental level. The
design of play modalities specifically for adolescents is important because most
interventions for people with ASD target children from ages 6 to 9 years of age (Matson et
al., 2007), with very few interventions focused on high functioning youth with ASD between
the ages of 10–14 (Bauminger-Zviely, 2013).
A contribution of the current study may be that the granular analysis of video recordings of social play among adolescents with ASD provided some insight into the reasons they have difficulty socializing. The root cause of social difficulties, in the case of the current study, appeared to be the presence of social obstacles that, for the participants, were distracting and limiting. Fascination with personal preferences (e.g., Dan focused on using cakes) and difficulty with interpersonal conflicts (e.g., fewer initiations made when playing with Enoch) were obstacles to effective socializing. Over the course of the sessions, however, the adolescents became less affected by personal preferences and interpersonal conflicts. Furthermore, the apparent effects of those factors on levels of engagement and affect were more pronounced during Free Play than during Structured Play, which suggests that, when participating in Structured Play, the adolescents were able to concentrate on the objectives of the play and socialize more effectively.

Implications for Practitioners and Researchers

When designing programs for adolescents with ASD, program designers should be aware of definitions of social behaviour. Any study of socializing requires a preconception of normal socializing, but typically developing children do not adhere to strict social behaviour guidelines. The play of children and adolescents, even those who are typically developing, often includes idiosyncratic behaviour that falls outside guidelines of expected behaviour. Even though restrictive and repetitive behaviours are part of the diagnosis (APA, 2013) and are included as subcategories of ASD screening tools (e.g., SRS-2, Constantino & Gruber, 2012), restrictive and repetitive behaviours are common among many youth and are not only characteristic of youth with ASD. The play of children may seem bizarre to adult observers because children often tease each other, make cultural references, and make silly
noises (Conn, 2014). The social interactions of youth must be considered within their context because children, like adults, are not isolated from their culture. In light of the diverse play behaviours of all youth, the analyses used in this study did not include stereotypy behaviour and self-stimulatory language as characteristic of ASD because all of the youth and adult participants, with and without ASD, verbalized and repeated terms (e.g., Lindsay repeated “TNT, TNT, TNT” as part of her play; an adult volunteer repeated “Dig dig dig dig dig” when excited). While the differences between social behaviour of youth with ASD and typically developing youth are meaningful and measurable (e.g., Constantino & Gruber, 2012), analyses of social interventions should understand that typical socializing is diverse, involves nonverbal communication, and does not fit into neat definitions (Conn, 2014).

Practitioners and researchers should choose outcome goals that have high social validity. The behaviour goals included in the current study, making initiations and engaging in co-operative play, are rated as valuable by researchers and program facilitators (Hurley, Wehby, & Feurer, 2010) and by the parents of the boys who participated in the current study. When designing social skills interventions, it is important that practitioners determine the social validity of the behaviour goals by consulting the parents and the youth themselves before and after the intervention (Bellini et al., 2007; Cunningham, 2012; Matson et al., 2007), because when families believe in the strategy they are more likely to initiate and then sustain involvement (Brookman-Frazee, 2004).

Of the social skills that are commonly taught (e.g., eye contact, joint attention), being able to initiate social exchanges is a skill that, if learned and practiced in natural settings, leads to more successful social interactions (Barakova, Bairacharya, Willemsen, Lourens, & Huskens, 2014; Koegel, Camarata, Valdez-Menchaca, & Koegel, 1998). Being able to
initiate social exchanges increases social skill generalization to new environments (Bellini, Peters, Benner, & Hopf, 2007) and is a predictor of long-term positive outcomes for youth with ASD, such as increased social engagement and more satisfying relationships (Koegel, Kuriakose, et al., 2012). Children with ASD are less likely to initiate interactions than typically developing peers (Sundberg & Partington, 1998). Being able to initiate social exchanges is often used as the litmus test for social skills because initiating social exchanges seems to be more challenging than other social skills (LeGoff, 2004). Even children with ASD who learned to appropriately respond to social interactions might have difficulty initiating independently and in new contexts (LeGoff, 2004). Being a more challenging skill, researchers measure the ability to initiate social exchanges as a key variable for improving social competence (Koegel, Bradshaw, Ashbaugh, & Koegel, 2013). As noted by other scholars (e.g., Conn, 2014), in-depth analysis of social intervention findings is required because the variables of initiations and level of engagement are limited in their abilities to measure the complexity of social behaviour. Future studies may benefit from exploring the interactions between the specific social developments of the boys and program components. For example, youth with core deficits related to social motivation (e.g., Oliver) benefit from social competence programming differently than do youth whose core deficits are more closely related to social awareness (e.g., Peter). Program designers and researchers may be able to determine how specific social profiles (e.g., low social motivation) are best addressed by intervention components (e.g., peer-mediated support) by recommending social programming based on what youth actually need.

Future studies may also benefit from analysing how social interactions are affected by the roles used in Structured Play. In other interventions that used Structured Play, the
roles were designed to create play obstacles for the youth. For example, when one of the youth had access to the toy (e.g., the role of Builder, LeGoff, 2004), the other youth had to wait for their turns. In the virtual space used in the current study, all of the youth had resource blocks so there was no way to limit each youth’s access. Instead of limiting the youths’ access to resource blocks, the roles in the current study were designed to shift power from the design team (i.e., Architect, Artist) to the Foreman. The power-sharing model utilized in the current study created tension that, as part of the play, had to be resolved among the youth. It was not always easy for the youth to follow orders and accept the perspective of the youth in the role of Foreman. To navigate the complex power dynamics, the boys had to learn and practice collaboration and co-operation skills.

**Limitations**

There are three major limitations to this study. First, this intervention included only four youth with ASD. Interventions for youth with ASD commonly focus on the development of less than five participants (e.g., Apple et al., 2005; Boyd et al., 2007; Campbell & Trincani, 2011; Koegel, Matos-Fredeen, et al., 2012), but the use of small sample sizes has been identified as a weakness in the research field (Dunst et al., 2011). While small sample sizes may limit the generalization of findings, in the case of the current study, fewer participants allowed for extensive analysis of the quality of each participant’s social play. In future studies, to increase sample size, the capture of 10-minute video probes, rather than entire sessions, may allow researchers to include more youth with ASD and still conduct close analyses of the participants’ interactions. A second limitation of this study was its length (eight sessions over about six weeks). While the social gains made by the boys in the current study were promising for a short intervention, programming that includes the
time commitments of intensive programming (30 hours per week) or non-intensive programming (30 hours over 10-12 weeks) would give a clearer picture of the development arcs of the youth with ASD (Gresham et al., 2001). The third major limitation of the study was that the adult volunteers took on roles (i.e., Architect, Artist, Foreman) and participated in the play among the youth in the virtual environment. Being present in the game was important for observations and screencast recordings; however, the adult volunteers occasionally became distracted by the play and missed opportunities to guide social interactions. Future research on the effects of adult participants in youth social interactions is likely to be informative in discovering ways to decrease the frequency with which adult volunteers get overly immersed in the play.

Despite these limitations, the current study indicates that role-based co-operative play with support from more knowledgeable others appears to be effective at improving social competence of youth with ASD. When required to co-operate in interesting Structured Play, the negative effects of extraneous factors were limited, so youth with ASD were better able to practice and demonstrate social skills. While some social skills (e.g., making eye contact) were not meaningful in the virtual setting, the youth were able to share joint attention and co-operate on imaginative, and sometimes abstract, tasks. Through their shared interest in the task and with a range of supports, such as adult facilitation, peer mediation, and video-modelling, over the sessions, the boys in the study appeared to shift the emphases they placed on items and tasks of personal interest to interacting with other youth in the study. Finally, even though videogame play has been considered detrimental to socializing (Mazurek & Engelhardt, 2013; Mazurek & Wenstrup, 2013), the present study suggests that
videogame play may be a useful modality for programs by which youth with ASD can learn and practice social skills through Structured Play.
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CHAPTER 4: PERSPECTIVES OF YOUTH WITH AUTISM SPECTRUM DISORDER AND THEIR PARENTS OF SOCIAL COMPETENCE PROGRAMS IN ONTARIO

Difficulty socializing with others is one of the fundamental diagnostic characteristics of autism spectrum disorder (ASD; American Psychiatric Association [APA], 2013). The consequences of reduced social competence can be profound, regardless of the cognitive and language ability of the youth with ASD (White, Keonig, & Scahill, 2007). For example, the limited social competence of many youth with ASD can make it difficult for them to integrate into their social networks (Locke, Shih, Kretzmann, & Kasari, 2015), succeed academically in school (Bauminger-Zviely, 2013), and find employment opportunities later in life (Taylor & Seltzer, 2011). The social challenges faced by youth with ASD do not diminish with age; in fact, with the onset of adolescence, youth experience new and complex social and emotional challenges. Compared to younger children, adolescents with ASD are at greater danger of social exclusion and loneliness (Bauminger et al., 2003; Locke, Ishijima, Kasari, & London, 2010) because of the social expectations characteristic of high school experiences (Laursen & Hartl, 2013).

To address the challenges faced by adolescents with ASD, program providers have developed a wide variety of intervention programs that help youth develop and practice skills related to social competence (Reichow & Volkmar, 2010) in clinical (e.g., Laugeson, Frankel, Gantman, Dillon, & Mogel, 2012; LeGoff, 2004) and community-based settings (e.g., Laugeson, Ellingsen, Sanderson, Tucci, & Bates, 2014). These intervention programs are designed to address the wide variety of impairments that relate to social competence, such as turn-taking (LeGoff, 2004), taking perspectives (Begeer et al., 2011), recognizing emotions (Tracy, Robins, Schriber, & Solomon, 2011), and interpreting nonliteral language.
(Norbury, 2005). Even though parents of youth with ASD typically enrol their children in a variety of programs (Goin-Kochel, Macintosh, & Myers, 2008), with adolescents with ASD tending to participate in several programs at once (average of 6.44 programs over six months; Kohler, 1999), parents of youth with ASD report feeling dissatisfied with the programs in which they enroll their children (Bitterman, Daley, Misra, Carlson, & Markowitz, 2008; Crane, Chester, Goddard, Henry, & Hill, 2015; Hodgetts, Nicholas, Zwaigenbaum, & McConnell, 2013).

While parents and program designers might seem like natural allies, the relationships between parents and program providers are not always positive. Program designers and parents do not always agree on the root causes of the social challenges faced by the youth (Noyes-Grosser et al., 2013; Ozonoff, Goodlin-Jones, & Solomon, 2005). Parents tend to adopt child-centric positions and focus on individual needs and characteristics of the child (Stoner, Angell, House, & Bock, 2007), whereas program designers tend to focus on deficit-centric positions and look for the program components that help the most participants (Stoner, Bock, Thompson, Angell, Heyl, & Crowley, 2005). As a result, program designers may discount the views of parents as peripheral to the developmental goals of the youth and as obstacles to implementation (Stoner et al., 2005), especially when parents’ perspectives differ from those held by the program designers (Keenan, Dillenburger, Doherty, Byrne, & Gallagher, 2010). Despite program designers acknowledging the value of the perspectives of parents to the development of intervention programs (Dunst et al., 2007; Hartley & Schultz, 2015), parents often feel excluded from program design and implementation (Tucker & Schwartz, 2013).
Parental engagement is crucial for the development of young people (Stoner et al., 2007). When families believe in the strategy, they are more likely to initiate and then sustain involvement. Furthermore, parents and youth reinforce and emphasize the social skills that they perceive as the most important (Rankin, Weber, Kang, & Lerner, 2015). When they feel excluded from the process of intervention development, parents report that they feel extra pressure to search for effective programs, a process they find exhausting and stressful (Brookeman-Frazee, Baker-Ericzen, Stadnick, & Taylor, 2012; Hodgetts, Nicholas, Zwaigenbaum, & McConnell, 2013; Siklos & Kerns, 2006).

The purpose of this study was to establish perceptions of the programs and interventions in which the youth had participated by interviewing parents and youth with ASD (ages 9–17). Examining parents’ perceptions of programming may provide a deeper understanding of the challenges they face (Russell & McCloskey, 2015). Little is known about how parents perceive programs and make program choices (Hume, Bellini, & Pratt, 2005), so more research is needed to examine the types of services and programs families access (Siklos & Kerns, 2006). This study was designed to explore: (a) what goals youth with ASD and their parents seek to accomplish through participation in programs designed to improve social competence, (b) which activities and practices are perceived to promote social competence by youth with ASD and their parents, and (c) which factors affect the decisions of parents of youth with ASD regarding social competence programs. The current study also included questions to develop a profile of the youth with ASD because parental perspectives should be considered in conjunction with severity ratings of the youth (Frey, Elliott, & Kaiser, 2014), in that the severity of the child’s autism is the strongest predictor of parental stress (Kissel & Nelson, 2014; Lyons, Leon, Roecher Phelps, & Dunleavy, 2010).
Extended emotional distress of the parents can cause the families to drop out of programming and services (Burrell & Borrego, 2012).

Method

The current study reports the perspectives of youth with ASD and their parents on social competence programs. Interviews were chosen for this study because interviews are considered to be powerful tools for understanding the lived experiences of others (Fontana & Frey, 2000). The method of interviews values the contribution of participants as experts on their own perspectives (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Informed consent was obtained from all parents and youth in accordance with the clearance of a university ethics review board (see Appendix C).

Participants

Twelve semi-structured interviews were conducted with 12 youths with ASD (ages 9-17) and with 15 parents; for three of the interviews, two parents (mother and father) were present. All but one of the youth participants were male. The parents in the current study were exclusively mothers when only one parent participated. Two sets of parents had more than one child with a diagnosis of ASD but answered the questions in relation to only the child who participated in this study. Parents were recruited through flyers on social media, listserv emails from ASD associations (e.g., Autism Ontario), and social networks of the participants. Participants were purposely recruited from a range of urban and rural areas. Of the 12 families in the study, four families lived in rural areas (townships with populations of less than 5000), five families lived in small cities (populations between 100 000 and 150 000), and three families lived in cities (populations larger than 150 000). Gift cards equivalent to $10 were given to each youth and each parent. The participant families were
long-time residents of Ontario and, at the time of the interviews, all but one of the participant families were living in Ontario.

**Procedures**

The interviews lasted 45–60 minutes and were conducted by the primary researcher through video conference or telephone call. The interview format was flexible to allow for shared or individual interviews. Each interview included questions for the youth and questions for the parent. Parents were present for the entire interview, even when the questions were directed at the youth. With the exception of three youth who listened to their parents’ interviews, most youth disconnected from the interview once they had answered the questions directed at them.

The interview questions for the youth focused on their interests and social experiences (adapted from Baron-Cohen & Wheelwright, 1999). The interview questions for the parents covered three main topics: (a) the youths’ previous program experiences (adapted from Learner Profile questionnaire; Alberta Education, 2006); (b) the youths’ interests and leisure activities (adapted from the Yale Special Interests Survey; Klin, Danovitch, Merz, & Volkmar, 2007); and (c) the youths’ social challenges and goals (adapted from the Intervention Rating Scale; Martens, Witt, Elliot, & Darveaux, 1985). The questions were adapted from the original questionnaire formats and phrased in a form appropriate to a semi-structured interview. Parents also answered questions to complete the Social Responsiveness Scale Version 2 (SRS-2; Constantino & Gruber, 2012) to assess the severity of their children’s characteristics of ASD. Seven of the participating youth had at least one subcategory score below the threshold for mild, while four had a total score below this threshold. These results should not be taken as evidence that the youth did not qualify as
participants with ASD. The participants’ diagnoses were determined by medical doctors and psychiatrists. The SRS-2 does not singularly determine the status of a diagnosis (Bruni, 2014), so scores below mild do not suggest the young people did not have ASD. Instead, the results of the SRS-2 provide insight into which subcategories of social challenges are most prominent for each individual. See Table 1 for the names, ages, and SRS-2 T-scores of the participants (pseudonyms are used throughout).

Table 7

<table>
<thead>
<tr>
<th>Parents</th>
<th>Youth</th>
<th>Age</th>
<th>AWR</th>
<th>COG</th>
<th>COM</th>
<th>MOT</th>
<th>RRB</th>
<th>TOT</th>
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<tbody>
<tr>
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<tr>
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<tr>
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<td>72</td>
<td>85</td>
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<tr>
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<td>63</td>
<td>71</td>
<td>52</td>
<td>62</td>
<td>66</td>
</tr>
</tbody>
</table>

AWR=social awareness; COG=social cognition; COM=social communication; MOT=social motivation; RRB=restricted, repetitive behaviour; TOT=total SRS-2 score; mild=60-65, moderate=66-75, severe=>76, entries in bold were considered severe

Analysis

The interviews were transcribed and analyzed with a constant comparative method and by using Atlas.ti, version 7 software. The analyses of the interview transcripts used a three-cycle method. During the first cycle of analysis, short descriptive phrases were applied to the transcripts through line-by-line coding of the content. During the second cycle, the codes were aggregated into broad categories as related to the research questions. During the
third cycle, broad thematic codes were derived from the categories. With every cycle, a qualitative approach to analysis was used that included checking back to the original documents in relation to the demographic data and the results of the SRS-2, which provided relevant contextual information for the participants. See Table 8 for an example of the process that moved the original transcript through line-by-line coding, categorization, and the creation of thematic codes.

Table 8

*Example of three cycles of analysis on section of interview transcript*

<table>
<thead>
<tr>
<th>Transcription</th>
<th>Line-by-line coding</th>
<th>Category</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>They had a lot of brain fitness things. It was good for his working memory and attention span. They weren’t good at core curriculum.</td>
<td>brain fitness</td>
<td>direct instruction</td>
<td>social goals</td>
</tr>
<tr>
<td>They didn’t have anything for social stuff. They had a wide range of social needs. They had varying abilities.</td>
<td>poor social programming</td>
<td>gaps in instruction</td>
<td>weaknesses of programs</td>
</tr>
<tr>
<td>They advertised as “come here and avoid bullying” and then that was the only place he was bullied. I paid $20000 a year for it. It was good at first.</td>
<td>bullying</td>
<td>costly</td>
<td>barriers to programs (cost)</td>
</tr>
<tr>
<td>I’ve found that little kids that age can be little shits. He probably would have come across that on his own. And some kids started to mature past him. We’re still dealing with the aftermath of that. There was some kid who beat him at sports and rubs his nose in it. We’re still not over it. He still won’t play sports because he doesn’t feel good about it.</td>
<td>frustration</td>
<td>working with peers (negative)</td>
<td>emotional goals</td>
</tr>
</tbody>
</table>

The responses of parents and youth were analysed in consideration of the severity of the characteristics of ASD of the youth, as determined by the results of the SRS-2 and the social profiles as described by the parents. Half of the youth with ASD who participated in the study had characteristics that were categorized by parents and the SRS-2 as severe. When
the responses of parents of youth with severe characteristics differed meaningfully from the responses of parents of youth with less-than-severe characteristics, the two perspectives are described separately.

Results

The results are organized by the three research questions and the themes that emerged from the analysis. The first research question “What do youth with ASD and their parents want from programs designed to improve social competence?” is examined through three themes: (a) social skills, (b) emotional wellbeing, and (c) developmental factors. The second research question “Which activities and practices are perceived to promote social competence by youth with ASD and their parents?” is explored through three themes: (a) individualized, (b) interest-based, and (c) interactive. The third research question “Which factors affect the decisions of parents of youth with ASD regarding social competence programs?” is considered by exploring access to programs and features of programs of both (a) clinical programs and (b) community-based programs.

What Parents Want from Programs

Parents of youth with ASD identified three main areas of focus as most important to the development of social competence. First, parents reported that they wanted programs to address the youths’ social skills in direct ways. Second, parents wanted the programs to support their youth’s emotional wellbeing. Third, parents wanted programs to be designed to reflect the changing requirements of the youths’ development and context.

Social skills. Above everything else, parents of youth with ASD tried to choose programs with outcome goals that addressed the particular social needs of their child. Parents with children with severe characteristics tended to identify the development of
fundamental social skills (e.g., “to be able to ask us questions,” Tony; “to have an ability to take perspectives,” Gretchen) or the reduction of non-preferred behaviour (e.g., “going out in public without getting too aggressive,” Lori) as most important. Parents of children with less-than-severe characteristics also identified particular goals (e.g., “don’t sound too silly,” Maxine), but in general the social goals they emphasized tended to be broad (e.g., “to have more regular friendships,” Carolyn; “to have a normal, healthy social life,” Cheryl) and to include complex social skills (e.g., “to get some improvement in a group setting,” Lynette).

Although the needs of the youth varied, their parents had clear ideas of what the youth needed. Further, the social skills that parents identified as valuable for their children’s development aligned with the results of the SRS-2. For example, Tony reported that his priority for Charlie, whose social communication was listed as severely restricted (T-score 85), was the development of clear speech: “[The other kids] don’t understand him so if he had the actual skill of, not vocabulary, but speech language skill, that would definitely help.” In the case of Gene, for whom social awareness was identified as severely restricted (T-score 89), his mother said that he would do better socially if he were more aware of how others perceived him: “He is a really big guy so he can be intimidating. He comes off as a little aggressive.” For Maurice, whose social motivation was rated as severely restricted (T-score 85), his mother reported that “the piece that is missing is the ‘why’ he would want to [make friends]. He doesn’t see the benefit of putting in the time…he will say I would rather play my video games” (Erin).

In a few cases, the youth were also able to identify which program goals would best help them to socialize. When asked what would help him co-operate with others, Earl, whose greatest challenge was identified as restricted and repetitive behaviours (T-score 78),
identified social skills that related to restricted interests as most important: “Breaking my autistic habits. Not getting stuck on my personal interests and getting stuck on talking about them all the time.” Maurice, whose primary social deficit related to social motivation, reported: “I find small chitchat more stressful than high concept politics and music. I find small talk stressful because I don’t know where the conversation is going.” While Earl and Maurice were able to identify their social needs, most of the youth participants were not. Answers like the one from Terrell, “I get along fairly well. I can’t think of any time we’ve had arguments,” were typical of the youth, who often overestimated their social capacities.

Emotional wellbeing. While parents sought programs that they believed would help their children improve their social skills, parents were also concerned with their children’s emotional wellbeing. Maintaining the emotional wellbeing of youth with ASD was very important to their parents. Parents and youth reported that the occasions when the youth were miserable were hard on the youth (e.g., “There were always tantrums,” Gretchen) as well as on the parents (“It was heart-breaking,” Cathy). Erik said that misunderstanding during unstructured play caused emotional challenges for his daughter Janey:

Especially in a big group here in the neighbourhood, she feels like they are picking on her, maybe because she is the youngest. It is easy to get, like when they are playing tag. She doesn’t understand that sort of thing. She gets frustrated and she comes into complain to us. That’s our biggest challenge, to have her play in groups.

Parents were additionally concerned with the emotional wellbeing of their children because unhappy children often caused program refusal. According to parents, there are two threats to the youths’ emotional wellbeing: direct attacks from other program participants and indirect attacks from the program’s structure.
According to the parents, youth with ASD were sensitive to unkind words of other youth participants. As one mother explained, teasing from another boy in the program had long-lasting effects:

I’ve found that little kids that age can be little shits. He probably would have come across that on his own. And some kids started to mature past him. We’re still dealing with the aftermath of that. There was some kid who beat him at sports and rubbed his nose in it. We’re still not over it. He still won’t play sports because he doesn’t feel good about it.

Besides the direct threat of unkind words, parents reported that the structure and content of the programs also posed threats to the youths’ emotional wellbeing. Parents reported that youth with ASD might not perceive the differences between their own development and the development of typically developing children until the differences were made plain in specialized programs:

In some ways, [programs] have really lifted the curtain so we see the differences between [him] and the other kids easily. We see the societal expectations. It has been hard on him because the more he is involved in something, the more he sees that he is different. (Erin)

Even though parents tended to seek out intense programs, they also looked for programs that they perceived as being compassionate: “Back then when I looked into Applied Behaviour Analysis…it was more like training a dog. And it looked mean-spirited and I wouldn’t do it to my kid” (Carolyn). Parents of youth with ASD were very concerned with their child’s emotional state:
What it comes down to, in these particularly crucial years in his life, his preteen years, he’s developing a sense of self-esteem and confidence…You don’t get a second chance at your sense of self-esteem and your sense of confidence. It is going to be harder to build on if it has been depleted. (Maxine)

While most parents considered inclusive settings to be crucial to their children’s development, some parents worried that interacting with typically developing peers in school and programs could negatively impact self-esteem of the youth with ASD: “He speaks to the kids but he doesn’t feel a part of it” (Carolyn). As an adolescent with ASD, the frustration Earl felt towards typically developing peers at his school was made clear through his choice of language: “I used to be not that confident in myself [because]…high school is full of judgmental assholes, you know?” Conversely, programs that only included youth with ASD were perceived as safe places for youth with ASD. Gretchen reported that her son Gustavo flourished emotionally when he participated in a live-in hospital program for youth with exceptionalities: “They were a little clique or group. They had the same type of problems and they got along really well…He thrived in that environment!” Parents reported that participating in programs with other youth with ASD provided a context of acceptance and tolerance: “The best thing about that is that the other kids have the same type of personality. There is no social awkwardness. Nobody thinks he is weird [and so] he’ll make a friend” (Maxine).

**Developmental factors.** In addition to the program goals that related to social skills and emotional wellbeing, parents of youth with ASD wanted programs to be designed to reflect the changing needs of the youth’s developmental stages. The needs of youth with ASD were influenced by personal factors (e.g., maturity, language development) and
external factors (e.g., acceptance, social exclusion). Dwight reported that his ability to connect with typically developing peers depended on his maturity:

There is one kid in my school. We were best friends in Grade 3 [then] we started not being friends. In Grade 4 to 7, we started having a fight. He stopped being my friend. I used to be immature, but now I’m mature.

Parents reported that the move from elementary school to secondary school brought new social and emotional changes: “He finds that [typically developing] kids in his class— they’re 13— their attitudes are changing. Everyone is too cool for school. They don’t want to talk. They don’t want to show excitement” (Maxine). Social goals change as the youth with ASD move into new stages and interact with different youth: “It’s kind of sad in one respect that I have to say to him, the goal is that, as you enter high school, you’re going to have to watch what you say” (Kate). Parents recognized that, although a program might be well-suited for their child at one stage of development, the program might not be appropriate as the youth developed further. Carolyn said that, although her son’s private therapist was very helpful, “I don’t know if she can take him to the next level.” Parents reported that programs had to consider the developmental stages of the participants because, as they grew into adolescence, the youth with ASD were less willing to interact with others who were developmentally below them. Carolyn reported that programs could fail if the other kids were not at the same level as her son: “Programs fail when he feels the others are beneath him.” Parents reported that they sought developmentally-appropriate programs and abandoned program decisions if the program design did not reflect their youth’s changing needs.
In sum, the primary function of social competence programs in the minds of adolescents with ASD and their parents was the development of social competence. That goal, however, was not the only outcome that mattered. Adolescents and parents also looked for programs that provided safe places for the adolescents to grow. Additionally, the participants reported that they sought programs that reflected and supported the adolescents through their developmental stages.

**Practices and Activities Perceived to be Effective**

Youth with ASD and their parents identified three program elements as effective practices for programs of social competence. First, parents and youth with ASD reported that effective programs were individualized for the youths. Second, parents and youth with ASD identified the inclusion of interest-based activities as crucial to effective programs. Third, youth with ASD and their parents described effective programs as programs that included opportunities for meaningful social interactions.

**Individualized support.** Parents believed that their children required strategies aligned with specific needs and so, as often as possible, they sought programs that were customized for their child. Carolyn reported that programs were most effective when “they customized things for how functional the kid is, rather than all the kids trying to access the same program.” Janey’s parents reported that she was often the only girl in the social programs so the programs did not provide for her individual needs. Janey’s mother Lynette reported that the programs that Janey joined were not specific to her needs: “The programs were very generalized, they were too generalized for someone who is high functioning and…there were only a few people who were at the same level. Some kids needed a whole schedule to get through the day.” Several parents highlighted specific programs, such as
Applied Behaviour Analysis, as examples of individualized programs. Individualized programs were considered effective because “they stress one concern or a couple of concerns or something that you would like to change” (Grace).

In addition to focusing on relevant goals, parents reported that another important component of individual attention was the inclusion of developmentally similar youth participants. For example, Cheryl chose programs for her son that included peers “that [were] truly his peers, and not affected or challenged with ASD more than he [was].” Maxine also emphasized the value of developmentally similar youth. According to Maxine, when her son Dwight interacted with developmentally similar youth, “he [was] completely at ease and he [had] conversations.”

In terms of program structure, parents reported that programs that included one-on-one support were better suited for individualized instruction. Parents preferred programs that had low youth-to-instructor ratios because the needs of individual youth could be addressed. Several parents identified karate as a program that was attractive because it provided some “one-on-one [support] in a group” (Kate). Parents such as Cheryl looked for programs that initially began with individual support and moved to group support:

So, they started off with [him] starting off in a one-on-one environment….They watched little videos and go into the community and practice what they had seen, or watched on the video. The way that they started off one-to-one, practicing what they were learning, and then moving to 2-to-1 ratio then moving to a larger group from there…seemed to be the best program out of all of them.

If the program did not include one-on-one support, parents and youth with ASD said that individual workers, such as respite workers and educational assistants, were an effective
way to bring individual support to a program. When partnered with an individual worker, youth with ASD were able to participate in activities that would otherwise be too challenging:

This past summer he went to a day camp for two weeks. Luckily, we got a respite worker to go with them. A one-on-one worker. He was able to go to the camp with the respite worker. (Kate)

To parents and youth with ASD, individualized program support was crucial and losing it was considered detrimental to the youths’ development (e.g., “He has lost [educational assistant] support, but he still needs someone to help him scribe,” Irene). If individualized support was not available, many families found ways to incorporate independent workers. When Carolyn could not find a program to provide guided social interactions, she hired a social worker to take her son into the community: “I wanted to see if they could find social opportunities.”

**Interest-based programs.** According to parents, topics of special interest were vital to the design of effective programs for social competence. The parents reported that youth with ASD often resisted social programs (e.g., “He hated it. He screamed and cried,” Carolyn), but could be persuaded to participate if the topic or activity was interesting. For example, Gretchen said that, even though her son “hated” programs and often refused to go, he was motivated to participate in programs based around his interests: “If I was going to teach him social skills, it would have to be around his interests.” When looking for programs to help Cesar, Kate said “I try to find something that interests him. We’ve gone through a variety of different ones. …Now that he can voice his opinion, I ask him.”

Another advantage of interest-based programs was that youth bonded with one
another when they shared interest in the topic. Socializing with typically developing friends may be difficult if those friends do not share the same interests as youth with ASD:

“Neurotypical friends his age don’t hold a lot of interest. They aren’t interested in things he’s interested in” (Maxine). Choosing topics of common interest was an effective way for youth with ASD to initiate and sustain conversations. Grace said that her son Ben’s interest in music was a powerful tool to connect with others: “He’ll do a whole conversation with someone if he is interested in what is going on at the time.”

In addition to the value of sharing common interests, youth with ASD and their parents reported that participation in interest-based programs improved communication skills. Parents believed that, when youth with ASD have opportunities to converse with others on shared topics of interest, the youth can learn social etiquette and turn taking. Adrian said of his son David:

He likes to talk and his interests are easy to share, but he has to understand that not everyone is as interested with the topic as he is. That is the way with a lot of people and with teenagers, and that is something that he is not attuned to, even in his own family.

Earl, a youth with ASD, identified the conversation skills he learned in interest-based programs as important to his overall development: “It was strenuous for me to get stuck on one thing. All I would talk about is my interests. But now I’m more versatile.”

Social interactions. According to parents, youth with ASD need to do more than passively participate in the activity of the program. To fully benefit from the programs, youth with ASD need to interact with other youth. Social interactions were implemented through programs in a variety of ways. For example, parents reported that social interactions
were possible through the application of structured play. When participating in structured play, players were forced to interact with each other by the inclusion of roles, objectives, and rules, which were designed to foster interactions. Being forced to interact with others by the structure of the program was considered to be good practice for youth with ASD. When asked what a perfect program for Charlie would include, Tony, his father, described a structured play activity that required interactions:

I would design a program where other kids needed [his] help. All successful conclusions would require collaboration. “This is your part, and this is your part. And when we get through Steps 1 and 2 alone, we need to work together to do Steps 3 and 4.”

Parents also identified having a close friend in the program as a way to include social interactions in program design. Not only did socializing with a close friend improve rates of interaction, but youth who found a friend in the program were motivated to sustain involvement. Gretchen reported that, even though her son, Gustavo, disliked sports and refused to attend sport-based programs, he was willing to participate in rock climbing when “one of the kids from class, who he thought was his best friend, was there.”

For many of the youth in the study, sharing knowledge with others was another way to interact. When youth with ASD had opportunities to pass on their knowledge, they were motivated to interact with others. For example, Lori said that, even though her son Gene had a difficult time socializing with other youth, he was willing to do it as part of his life skills program: “He did a week of life skills. He went to the fire hall and learned to use a fire extinguisher, and then he was teaching others to use a fire extinguisher.” Helping others was motivating for many of the youth in the current study: “He will participate if he thinks that
he is helping others” (Carolyn). Contrary to the perception of youth with ASD as isolated and self-centric, many of the parents said that their children “like to be supportive” (Grace).

Kate reported that her son Cesar was highly motivated to teach other youth:

Every day he is dismissed out of his class early, and he helps the teacher get the students ready. He helps the Kindergarten kids. He helps them get their lunch bags ready and get their boots on, things like that. He has helped with the Breakfast Club, which is just before the bell rings. He likes to do a lot to help the younger kids.

In sum, adolescents with ASD, like most people, want to participate in programs that are engaging for them. Adolescents and their parents perceived that the most engaging programs provided interesting activities, individual attention, and opportunities for social interactions.

Factors Affecting Program Decisions

While parents of youth with ASD had clear goals and could identify which practices and activities they considered most effective, they could not always access the programs they considered to be the best match for their children’s needs. Parents reported that clinical programs (e.g., Intensive Behaviour Interventions, transcranial magnetic stimulation) were highly sought after but difficult to access. Nearly every parent mentioned at least one clinical program that they wanted to access but, because of barriers to service, could not: “There is an intense treatment [that would have helped] but I can’t get funding” (Carolyn). Families who could not access their preferred programs reported that they felt desperate (e.g., “We join whatever is available, whatever they will allow us to do,” Grace) and turned to community-based programs run through local libraries and autism associations (e.g., Movie Night, Teen Cuisine, Respite Weekend). While parents did not generally consider
community-based programs to have the evidence base of clinical programs, parents enrolled their children in community-based programs because those programs were more accessible. According to parents, the factors that affected their decisions for programs were the barriers and weaknesses related with clinical and community-based programs.

Clinical programs. Families of youth with ASD identified clinical programs as the best programs for their youth (e.g., “the PEERS program out of UCLA…looks really good,” Carolyn) but, for many families, cost and location were barriers to accessing these programs. Of the 12 families in the current study, two parents reported that they were able to pay privately for clinical programs (e.g., “Even though our funding was cut off, we’re managing to scrape together money to continue his therapy,” Tony). The costs of clinical programs were too high for the other families in the study (e.g., “To pay the full price was too much. That is a problem,” Grace). For families who could not afford clinical programs, applying for government funding was the next option. Unfortunately, parents reported that the waitlists for program funding were quite long (e.g., “We did phone the government. We went on the wait list. They called [us] back a year and a half later,” Carolyn). In addition, government funding was a barrier because the funding covered a limited block of program sessions. Carolyn described her frustration with accessing public funding for programs: “The biggest thing about publicly funded anything is that you don’t get enough. The 10-block sessions they do are useless…What is the point?” Cheryl thought her son could benefit from more sessions of a government-funded program: “It was a good program, but the difficulty was that it was so limited in time and scope. Again, once you took the course…you couldn’t take it again.”
Location was another barrier to clinical programs. Parents reported that, because many clinical programs were associated with hospitals and universities, clinical programs were not available outside of major urban areas. For families who did not live in a city, the travel time was an obstacle to service (e.g., “Anywhere in the city is about 45 minutes to an hour away. We find that transportation is always a concern. It is more difficult to go,” Lori). Finding ways to schedule the extra travel time during the school week was particularly difficult for Carolyn:

The problem was the drive. It started at 5. So I had to get him out of school early to get downtown for 5. I had to feed him McDonald’s or some crap so it was a 5-hour thing for a 90-minute session. [The program] was useful but when you added [the extra time], it was stressful for both of us.

While clinical programs were considered to be the most effective programs, two parents (i.e., Tony, Gretchen) highlighted transferability as a weakness of clinical programs. Tony and Gretchen reported that the transfer of skills learned in specialized contexts, such as clinics or isolated rooms, to natural settings, such as classrooms and playgrounds, was limited: “The goal of Intensive Behaviour Intervention is communication…Occasionally we will go to the park, but there are limited social interactions. Social interaction that we see from this end is limited” (Tony). Gretchen described her frustration with a university-affiliated social skills program: “He *theoretically* passed but I don’t know if I saw any differences…He couldn’t take the learning and apply it to the situation when he was feeling emotional.”

**Community-based programs.** Parents reported that there were fewer barriers to community-based programs than to clinical programs. Compared to clinical programs, the
costs of community-based programs were low. In fact, several parents said that organizing associations often subsidized the costs of attending organized events: “It was fun to get out and do different things [that] we couldn’t afford normally” (Grace). Also, community-based programs were available in more locations than clinical programs. Parents in the current study reported that community-based programs were organized through local chapters of autism associations (e.g., Autism Ontario) in many small- and mid-sized cities and so they were accessible for families living in rural areas and small towns.

While community-based programs were much more accessible for families of youth with ASD, parents identified two main weaknesses in the programs: (a) program specificity and (b) staff training. Parents reported that community-based programs were designed to include as many youth as possible and, therefore, could not address specific challenges faced by individuals in the program (e.g., “[The program] was a failure because the kids weren’t as far along as he was,” Carolyn). The wide range of developmental needs of the youth in community-based programs meant that some youth “found it hard to interact with the other kids and…[felt] socially awkward” (Erin).

Another weakness of community-based programs identified by the parents was the lack of trained staff. According to Carolyn, her son Earl could not complete an overnight camp experience because the staff was unprepared for her son: “They couldn’t handle him at the time. They supposedly specialized in it, but they couldn’t handle him.” Gretchen reported that poorly trained staff was the reason why her son could not continue attending gymnastic classes:
He was kicked out of two gym clubs, which still bothers me because, I get it that he was a danger to other kids if he was running around, but if [program staff] worked with him and accepted him, it might be something else that he is interested in now.

Synthesizing these ideas, the results suggest that, when they chose programs for their children, parents looked for the best programs they could access. When possible, parents selected clinical programs affiliated with universities or hospitals. Factors such as cost and location meant that many parents and families could not access their preferred programs. When clinical programs were not accessible, parents turned to community-based programs to help their children as a less desirable alternative.

**Discussion**

The current study sought to explore the perspectives of youth with ASD and their parents on the considerations and factors related to social competence program decisions. According to parents and youth, the specific social needs of the youth need to be considered along with the youths’ emotional and developmental needs: “If he is…uptight and worried, he is not going to be learning” (Miriam). When asked to describe effective program design, parents and youth identified individualized, interest-based, and socially interactive activities as the best ways to support the youths’ social competence. Accessing programs that included those best practices was a high priority for parents of youth with ASD but their efforts were, at times, frustrated by the barriers to programs and weakness of designs. Not having access to the best programs meant that parents had to make difficult decisions as they navigated a network of programs with varying levels of effectiveness. The following discussion is organized to parallel the topics of the results section: (a) what parents want from programs,
(b) practices and activities perceived to be effective, and (c) factors affecting program
decisions.

**What Parents Want From Programs**

The results of the current study extend the results of previous research (e.g., Bellini, Peters, Benner, & Hopf, 2007; Cunningham, 2012; Matson, Matson, & Rivet, 2007) demonstrating that consulting with parents and including measures of the social validity of programs (Gresham & Lambros, 1998) are important steps in program design and implementation. Social validity in this case is the measure of how valuable parents and other stakeholders consider the program outcomes and methods to be (Bellini, Peters, Benner, & Hopf, 2007; Cunningham, 2012). Parents are more likely to initiate and sustain their child’s involvement when they believe the goals and strategies of the program are helpful (Brookman-Frazee, 2004). Additionally, parents of youth with ASD can contribute to the process of program design (Hartley & Schultz, 2015). Even if they lack formal training, parents of youth with ASD are well positioned to understand the social challenges faced by their children because they see their children in a wide variety of social situations and over the span of the children’s lives. As demonstrated by the families in the current study, parents have specific goals in mind for the interventions and, from that vantage point, seek strategies that match those goals. By including measures of social validity, program designers can learn from parents which strategies and outcomes are best for the youth.

Results from the current study suggest that, while many youth with ASD have difficulty understanding the nature of their social challenges, some youth with ASD can describe their own social challenges. Of the 12 youth participants, five youths expressed an understanding of the severity of their social characteristics that aligned with the perspectives
of their parents and the results of the SRS-2. For example, Maurice’s view of his own social challenges (e.g., “I tend to not socialize with other people; I tend to find social situations awkward and mentally straining”) agreed with his mother Erin’s view of his social challenges (e.g., “He found it hard to interact with the other kids; he found it socially awkward”) and his SRS-2 results (e.g., social cognition and communication severely restricted). Given that youth with ASD usually show little understanding of the differences between their own social capacity and normative socializing (Rankin et al., 2015), the finding that some of the youth could express their social challenges was somewhat surprising. Previous studies have shown that youth with ASD tend to have overly positive views of their social competence, compared to the views of their parents, with this phenomenon more pronounced when the youths’ social deficits are more severe (e.g., Tantam, 2000). Youth with ASD, especially those who are high-functioning, may know their social challenges and be able to contribute that knowledge to the design and implementation of programs for social competence.

While the parents in the current study reported feeling desperate to find programs that helped their youth develop social skills, their children’s emotional needs were also important. Parents reported that they avoided inclusive programs, if interacting with typically developing peers might harm the child’s self-view. The anxieties expressed by the parents and youth with ASD in the current study about inclusive programs aligned with the findings of similar studies on the attitudes of families towards inclusion. While parents generally hold positive views of inclusion practices (Gallagher et al., 2000), they tend to be concerned about the quality of individualized support and the level of social cohesion in these programs (Hodgetts et al., 2013; Ladarola et al., 2015). When designing programs that
include typically developing peers, program designers need to consider the anxiety felt by parents and youth with ASD around the potential for social exclusion by typically developing peers. Program designers may be able to reduce the anxiety of youth and parents by creating opportunities in safe contexts with purposeful and structured interactions (e.g., LeGoff, 2004; MacCormack, Matheson, & Hutchinson, 2015).

**Practices and Activities Perceived to be Effective**

While parents identified practices and activities from both clinical and community programs as effective, they tended to value programs based in clinical settings over programs based in community settings, despite the advantages offered by community programs, such as naturalistic setting and low cost. This finding is in line with other studies of parental perceptions of program efficacy, which have found that parents seek out clinical programs, and rate their effectiveness more favourably, than community-based programs (Goin-Kochel, Mackintosh, & Myers, 2009). In the views of the parents in the current study, interventions that had empirical evidence that was collected in a clinical setting, were the most likely to help their children. The preference of parents to include their children in clinical programs has two main implications for program design. First, community-based programs should incorporate the evidence-based features that make clinical programs so attractive to parents. Second, program designers must, at every opportunity and in a variety of ways, evaluate and improve the effectiveness of community-based programs.

The findings of the current study, that youth with ASD were highly motivated to participate in activities based on their interests, reflects the results of similar studies (e.g., Dunst, Trivette, & Masiello, 2011). The value of interest-based interventions for youth with ASD has been recognized for a wide range of outcome goals (e.g., social skills, Jull &
Mirenda, 2010; academic skills, Koegel, Singh, & Koegel, 2010) and as a central component of evidence-based therapeutic programs (e.g., Pivotal Response Therapy, Koegel & Koegel, 2012). Despite the wide adoption of interest-based practices, some misconceptions about interests of youth with ASD are still pervasive in the literature. For example, the interests of youth with ASD are generally considered to be narrow and have been described in the literature as circumscribed (Turner-Brown et al., 2011), restricted (Mercier et al., 2000), and limited (Baron-Cohen & Wheelwright, 1999; South, Ozonoff, & McMahon, 2005). While some youth with ASD have narrow interests, the youth in the current study were able to identify a wide variety of activities that they found interesting. When asked to describe their interests, all of the youth identified at least five different activities (e.g., “I play the mandolin…I’m hoping to get a pan flute…I like carving. I am into carpentry…I have an old-fashioned radio. I also like crafts,” Chris). Much like the interests of typically developing youth, the interests of the youth in the current study were heterogeneous, individual, and wide-ranging. Rather than presuming that the interests of youth with ASD are restricted or fall into easy categories, program designers who want to incorporate interests into program design should work with the youth to identify which activities are genuinely of interest to them (Dunst et al., 2011). Identifying the individual interests of youth in the intervention prior to its design may be effortful, but the extra effort may be worth the time. Indeed, compared to programs that used situational interests, the effect sizes of programs that took the time to identify personal interests of the children with ASD were almost twice as large (Dunst, Trivette, & Masiello, 2012).

Several parents and youth with ASD in the current study reported that helping others was a productive form of social interaction. The finding that youth with ASD develop when
they are engaged in acts of contribution towards others may be relatively novel to the field of autism research, but it aligns with the findings of research on factors of thriving for typically developing youth (e.g., Lerner, Almerigi, Theokas, & Lerner, 2005; Khanna, MacCormack, Kutsyuruba, McCart, & Freeman, 2015). According to the framework of positive youth development (e.g., Five Cs Model; Jelicic, Bobek, Phelps, Lerner, & Lerner, 2007), positive contributions to self, family, community, and society are crucial to the wellbeing and development of typically developing youth. The results of the current study appear to show that youth with ASD may not be exceptions to that rule. Like parents of typically developing peers (Narumanchi & Bhargava, 2011), parents of youth with ASD believe that their children can benefit by contributing service to others. Finding ways to engage youth with ASD by including opportunities to teach and support other youth may improve the effectiveness of programs designed for youth with ASD, especially for those youth who are high-functioning.

Factors Affecting Program Decisions

The results of the current study extend the results of previous research (e.g., Lyons et al., 2010), demonstrating that parents are stressed by the task of supporting the needs of youth with ASD, especially during adolescence. Without exception, the parents in the current study reported that the challenge of finding programs for their children compounded the stress associated with parenting a child with ASD. As the engine of program decisions and implementation, parents of youth with ASD in previous research have reported feeling stressed by the intense caretaking responsibilities (Jinnah & Stoneman, 2008) and financial pressures (Jarbrink, Fombonne, & Knapp, 2003) that come with being a parent of a youth with ASD. According to Siklos and Kerns (2006), most parents have difficulty accessing
services for their child, such as developmentally appropriate after-school activities (77%), opportunities to play with typically developing youth (64%), and financial support to provide for therapies and services (93%). The stress experienced by parents of youth with ASD does not lessen as the youth get older. As children move into adolescence, their social networks become more complex and their relationships become more mature (Tobias, 2009). Much like the results of other studies, parents in the current study reported that the increased social demands of adolescence impacted their children (e.g., “He hit puberty with a bang and blew up,” Carolyn) and compounded the stress experienced by the parents. Considering how program decisions are affected by stress (Brookman-Frazee, 2004; Hodgetts et al., 2013), reducing parental stress should be a primary concern for practitioners who support the development of older youth with ASD (Burrell & Borrego, 2012).

As noted in previous studies (e.g., MacCormack et al., 2015), community-based programs play an important role as service providers, especially for families who do not have regular access to clinical-based programs. Unfortunately, community-based programs do not always incorporate the best empirical evidence (Drahota, Aarons, & Stahmer, 2012; Ratcliffe, Wong, Dossetor, & Hayes, 2014; Stadnick, Stahmer, & Brookeman-Frazee, 2015), so families who are desperate to find effective, accessible social programs instead find poorly designed programs that do little more than serve as network hubs (e.g., “A lot of time the parents will meet each other, get to talking, and exchange phone numbers,” Maxine). Future studies should focus on how evidence-based practices can be meaningfully incorporated into community-based programs.
Limitations

There are two main limitations to this study. The first limitation relates to the sample, which was restricted by recruitment and size. While focusing on 12 families allowed for more comprehensive interviews than might be plausibly expected from a larger sample study, the small sample size (i.e., 12 youths, 15 parents) may reduce the generalizability of the results of the study. Participants for this study were recruited through social media, listservs of autism associations, and personal networks in several regions in southern Ontario. For this reason, the results may not represent the perspectives of parents unaffiliated with autism associations and those who live outside of the catchment area.

The second limitation of the study is the gender representation of the participants. The current study relied on the perspectives of mostly female parents and mostly male youth participants. Even though parental perspectives from a disproportionate gender divide (i.e., mostly female parents) is a limitation common in autism research and the broader field of disability studies (Woodgate, Ateah, & Secco, 2008), some studies suggest that there are significant differences between how mothers and fathers perceive programs and the development of their children. The perspectives of mothers can be very different from those of fathers on the importance of items related to after-school programs and services (e.g., “information about special programs and services available to my child and family,” mothers 23.3%, fathers 4.1%; “have my child’s therapies continue outside of school,” mothers 27.4%, fathers 6.8%; Hartley & Schultz, 2015). In terms of the youth participants, the gender divide in the current study was not proportionate to the gender proportions of youth with ASD. Balancing the gender divide of youth participants is important because parents perceive autistic characteristics of boys differently than the characteristics of girls.
Compared to the social deficits of boys, the social deficits of girls are rated as more problematic (Posserud, Lundervold, & Gillberg, 2006). Also, parents of boys rated self-control as more important than did parents of girls (Rankin et al., 2015). Recruitment practices that include more proportionate representation of genders may provide a better view of the perspectives of youth with ASD and their parents.

**Concluding Comment**

Despite these limitations, the parents of these youth with ASD appeared to be able to identify their children’s areas of social needs. Without knowing the results of the SRS-2, parents provided descriptions of their children’s social competence that aligned with the findings of this social measure. Parents recognized the needs of their children as an interaction among three distinct categories: (a) social needs, (b) emotional wellbeing, and (c) developmental factors. Not only did parents understand their children’s needs, parents were able to identify practices and services that they believed would help their children and to describe the factors that affected their program decisions. As parents have to navigate the complex system of program implementation marked by access and features of service, knowing more about how parents and youth perceive the social needs of the youth may help program designers develop interventions in which families are willing to invest their time.


CHAPTER 5: GENERAL DISCUSSION

We have known since the earliest observations of autistic behaviour (Kanner, 1943) that youth with ASD are often more interested in participating with preferred items in isolation than in socializing with their peers (American Psychological Association [APA], 2013). However, when participating in effective social intervention programs, like the ones described in Studies 1 and 2, the quality of the social interactions of children and adolescents with ASD tends to improve (Barakova, Bajracharya, Willemsen, Lourens, & Huskens, 2015; Koegel, Bradshaw, Ashbaugh, & Koegel, 2013; LeGoff, 2004; Stadnick, Stahmer, & Brookeman-Frazee, 2015). Examining the features of effective programs is an important step to understand how programs support development of social competence and how children and adolescents with ASD benefit from these programs. To that end, the purpose of the current dissertation was to identify the features of effective social competence interventions for children and adolescents with ASD by exploring their experiences. The three studies are based on the analysis of approximately 1,480 minutes of social interactions with youth with autism spectrum disorder (ASD; 840 minutes of Structured Play, 560 minutes of Free Play, 80 minutes of Non-play) and 70,000 words transcribed from interviews with children and adolescents with ASD (n=28), their parents (n=31), adult volunteers (n=4), and a program designer (Coordinator).

The features of effective interventions should not be thought of as a check-list for success (Vygotsky, 1978, 1994). Exploring the features of programs for learners should be done with careful consideration of the interactions between development and context. Researchers should not view context as a collection of certain qualities or features that, if appropriately applied, objectively determines the development of the child. Instead, features
should be approached from the point of view of “the relationship which exists between the child and its environment at a given stage of his development” (Vygotsky, 1994, p. 338). In the present work, child-environment relationships are viewed through the lenses of three overarching themes: (a) interests, (b) structure, and (c) naturalistic settings, each of which is analysed in light of extant literature and Vygotsky’s perspectives. A discussion of the implications of these themes to research and practice follows the thematic analysis. Final reflections conclude the dissertation.

**Interests**

A major finding of all three studies in the current dissertation was that interventions were effective when they involved the interests of the participants with ASD. Known for having low motivation for social interactions (Lovaas, 1987; Koegel, Firestone, Kramme, & Dunlap, 1974; Koegel & Mentis, 1985), people with ASD tend to be more likely to socialize when they are participating in activities that incorporate shared interests (Dunst, Trivette, & Masiello, 2012; Gunn & Delafield-Butt, 2015; Jones & Carr, 2004; LeGoff, 2004; Vismara & Lyons, 2007). Youth with ASD and their parents were drawn to participate in Studies 1 and 2 because LEGO™ (Study 1) and Minecraft™ (Study 2) were activities of high interest. Parents reported that they were more likely to sustain their children’s involvement in programs where their children were interested in participating and seemed to be having fun: “At this stage, he's just happy to come…I'll look over and I'll see him engaged in conversation and laughing and smiling” (Father, Study 1). An additional advantage of including interests into interventions was that finding communities of people with similar interests validated the youths’ fascinations: “It validates the idea that [he is] not the strange one who likes Minecraft™. [He] just has to find others who like Minecraft™” (Mother,
Study 2). It was apparent, based on the results across the three studies that, without the motivation that comes along with participation in preferred activities, youth with ASD may be less likely to engage in the effortful task of learning and practicing social skills.

Interest-based programs have been used to increase socializing (Craig, Brown, Upright, & DeRosier, 2015), rehabilitation (Lohse, Shirzad, Verster, Hodges, & Van der Loos, 2013), and communication (Barber, Saffo, Gilpin, Craft, & Goldstein, 2015) for non-ASD populations. However, they have been generally resisted for ASD populations because of the negative connotations of interests for individuals with ASD (Koegel & Koegel, 2012). The perseverative and narrow interests of individuals with ASD have been a diagnostic characteristic of ASD since Kanner (1943) first identified “special interests” (p. 233) that occupy the thoughts and activities of children with ASD. While the interests of people with ASD are sometimes focused on mechanical processes, inanimate objects, and non-social objects (Baron-Cohen & Wheelwright, 1999), people with ASD can have a wide range of interests on many topics (South, Ozonoff, & McMahon, 2005). When interests are incorporated into program design, children with ASD tend to be more motivated to participate in the program (Koegel et al., 2012; Whyte, Smyth, & Scherf, 2014).

Vygotsky (1978) believed that, to benefit fully from the advantages of learning opportunities, young people need to participate in activities that engage them. A strong advocate of the power of pleasurable learning, he believed the richest development happens when the child is having fun. The motivations of children are related to development and change dynamically as they develop. In Vygotsky’s own words:

If we ignore the child’s needs, and the incentives which are effective in getting him to act, we will never be able to understand his advance from one developmental stage
to the next, because every advance is connected with a marked change in motives, inclinations, and incentives. (Vygotsky, 1978, p. 92)

Vygotsky’s work spoke little about the value of interests for learning. His view of motivation did not extend beyond considering the needs and incentives of a child. What Vygotsky failed to realize, (or, at very least, to articulate in his writing), was that understanding the personal and changing interests of each learner is a crucial component of supporting the learner’s needs. By incorporating activities and objects of personal interest into learning activities, learners can sustain engagement in the task, which can improve rates of development.

**Structure**

Structure was recognized as a valuable feature of programs for the social development of children and adolescents with ASD for all the studies of the current dissertation. Structure was embedded into the interventions through *interactions* and *instruction*. Interactions were included in Studies 1 and 2 in the form of Structured Play, whereby the youth were required by the structure of roles to interact with one another to complete shared tasks. Close analysis of the triad interactions (Study 1) showed how the initiation of and response to social bids during Structured Play might be useful practice for social exchanges. Youth with ASD and their parents perceived that Structured Play improved social interactions because, through the Structured Play, the youth were forced to interact with each other in ways that, without its inclusion in play contexts, might have been effortful and unpleasant.

Instruction was an additional form of structure. Typically developing peers and adult volunteers worked as behaviour models and demonstrated social skills such as taking turns,
verbal communication, and co-operation during Structured Play. Additionally, the adults
provided instruction and intervened, as necessary, to provide direct support for the young
participants with ASD who were experiencing emotional or sensory overload. The value of
structured instruction to the interventions in Studies 1 and 2 was recognized by the parents:

[It is] guided by the particular instructor volunteer [and that] the kids are fully
supported. Often times our kids don't have the words they need to communicate an
idea or want or how to interact appropriately…So, they feel supported in groups of
three or four kids to one adult. And all of the social interactions can be guided,
worked through, or prompted as needed. (Mother, Study 1)

Parents reported that they preferred structured programs over unstructured programs because
programs that included structured interactions and activities were better able to provide
individualized support. In all studies, but in Study 3 in particular, parents further indicated
that structured programs might help reduce the anxiety of the participants because repetitive
and predictable programs were less stressful for the youth.

The current use of structured interactions and instruction follows a trend in the
literature towards their inclusion in interventions. Structured interactions in play modalities,
Structured Play, have been used to support development of people with ASD (Cress, Arens,
& Zajicek, 2007; LeGoff, 2004) and other developmentally disabled populations (Taneja et
al., 2002; Thiemann-Bourque, Brady, & Fleming, 2012), but they may be best known for
their application in Kindergarten settings (Fisher, Hirsh-Pasek, Newcombe, & Golinkoff,
2013; Ray, Stulmaker, Lee, & Silverman, 2013; Skolnick Weisberg, Hirsh-Pasek, &
Michnick Golinkof, 2013; Weisberg, Zosh, Hirsh-Pasek, & Golinkoff, 2013). Even though
some critics of play-based methods have problematized its reliance on small sample sizes
and inconsistent program methods (Pyle & Bigelow, 2015), the evidence of its effectiveness is promising (Bratton, Ray, Rhine, & Jones, 2005). Moving forward, more rigorous evidence may be made available through classroom-based research as both child-initiated play and Structured Play are being recognized as “vehicles of learning” (Ontario Ministry of Education, 2010, p. 13) and are being embedded as components of curricular policy (Pyle & Bigelow, 2015).

Structured instruction from adults (e.g., therapists, teachers, trained staff) is an important component of many evidence-based therapies for young people with ASD, including Applied Behaviour Analysis (Strain & Schwartz, 2001), Intensive Behaviour Intervention (Lovaas, 1987), DIR/Floortime therapy (Mercer, 2015; Wieder & Greenspan, 2003), and Pivotal Response Therapy (Koegel & Koegel, 2012). The use of typically developing peers as instructors and behaviour models is also common in social interventions for people with ASD (Koegel, Vernon, Koegel, Koegel, & Paullin, 2012; Wolfberg & Schuler, 1993). As intervention agents, peers have been used to promote social behaviours by initiating social bids (Chan et al., 2009), prompting responses (Wang, Cui, & Parrila, 2011), and modelling preferred behaviours (LeGoff, 2004). The incorporation of trained peers into social competence programs provides social practice for the children with ASD and extends their maintenance of skills (Hughes et al., 2011; Katz & Girolametto, 2013; Owen-DeSchryver, Carr, Calle, & Blakely-Smith, 2008).

Vygotsky (1978) might have considered the use of structured interactions (Structured Play) to be a positive feature of the interventions. The structured interactions in Studies 1 and 2 functioned as a model of behaviour for the participants with ASD. By participating in the play, the youth had opportunities to practice complex social skills such as making social
bids (Study 1) and collaboration (Study 2). Through structured interactions, the youth with ASD mimicked the social behaviour of the others, which Vygotsky believed was an important step towards development. Being able to mimic the behaviour of others is not a precursor to learning, according to Vygotsky; being able to follow models of behaviour is evidence of learning that will be later internalized as development.

Structured instruction, as it was implemented in Studies 1 and 2, was an important component of Vygotsky’s (1978) perception of the zone of proximal development, as illustrated by his oft-cited description of the zone of proximal development as the “distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). The structured instruction provided by adults in Studies 1 and 2 aligns with Vygotsky’s view of the value of practicing new learning with a more knowledgeable other. Despite the inclusion of “more capable peers” in the above quote and the fact that peer-based instruction is often associated with Vygotskian perspectives (e.g., Donato, 1994; Sanders & Welk, 2005), Vygotsky was not convinced of the usefulness of peers for development. The phrase “in collaboration with more capable peers” (p. 86) was added by the editors of Mind in Society (1978) who took liberties with Vygotsky’s original work so it could be understood by North American audiences. As a consequence, the phrase may not represent Vygotsky’s position on the use of peers as more knowledgeable others (Gredler, 2012). On the contrary, Vygotsky believed that groups of children were not capable, on their own, of facilitating their own cognitive development. However, besides the inclusion of typically developing peers, adults were
included in Studies 1 and 2 to facilitate interactions among the youth and keep the groups focused on their shared tasks.

**Naturalistic Settings**

Naturalistic settings, such as the locations for Study 1 (community recreation hall) and Study 2 (classroom), were identified in all three studies as a valuable component of programs for social competence. From a research perspective, naturalistic settings are more than just locations; naturalistic settings represent a research perspective that recognizes that, when young people learn new skills while doing regular tasks in familiar places with peers, they are more likely to transfer that learning to new settings (Koegel & Koegel, 2012; Roper & Dunst, 2003; Wolf, 1973). Compared to clinical settings, which can be highly controlled, operationalizing research in naturalistic settings means using loosely controlled design elements so the participants can learn and practice skills with others in ways that feel like ordinary, everyday life situations (Dunst, Trivette, Humphries, Raab, & Roper, 2001; Pierce & Schreibman, 1995).

The use of naturalistic settings provided three main advantages for the studies in the current dissertation. First, the use of naturalistic settings in Studies 1 and 2 allowed for loosely controlled contexts; participants felt safe making autonomous decisions about their participation, such as how often to speak, with whom to play, and when to engage in interactions, especially during Free Play. Second, the use of naturalistic settings allowed for participants with co-morbid diagnoses, a population that tends to be excluded from clinical settings, to participate (Koegel et al., 2014; LeGoff, 2004; McMahon, Vismara, & Solomon, 2013; White et al., 2013). Through naturalistic settings, participants with ASD could use toys and objects (building blocks, iPad apps) with familiar and age-similar youth. Parents
who were interviewed in Study 3 reported that they sought social programs with naturalistic settings because their children tended to enjoy programs that incorporated familiar tasks with age-appropriate peers.

The value of naturalistic settings has been recognized since the 1980s when behaviour researchers started to change contexts as a way to improve the results of discrete trial training sessions. The children with ASD in those training sessions did what they could to avoid participating and, outside of the sessions, required extensive prompts to transfer their learning (Koegel & Koegel, 2012; Schreibman et al., 2015). By situating interventions in settings that more closely resembled the places where children and adolescents lived their lives, the children participated more freely and their learning was more easily transferred to new settings (Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984; Koegel, Dyer, & Bell, 1987). Compared to clinical interventions, naturalistic interventions tend to focus more on supporting the child’s wellbeing (Banda, 2015; McGee, Feldman, & Morrier, 1997), finding ways to incorporate family and typically developing peers (Ingersoll & Wainer, 2013; Trembath, Balandin, Togher, & Standcliffe, 2009), and including objects and activities of interest to the participants (Dunst, Trivette, & Masiello, 2012; Koegel et al., 2012; Koegel, Kim, Koegel, & Schwartzman, 2013).

Vygotsky (1978) would not likely have been surprised by how valuable naturalistic settings have been to the development of social interventions for youth with ASD. Vygotsky believed that understanding the developmental processes of children requires a deep understanding of their lived experiences and contexts, and that best learning happens when the task is meaningful to the world and natural to the development. To this end, naturalistic settings could be effectively used for research. In fact, when carried out objectively,
observations and experiments conducted in play, school, and community settings could be as rigorous, if not better executed, than research conducted in clinical settings. In these ways, Vygotsky’s perspective broke down the partitions between clinical and nonclinical research by recognizing that natural spaces are optimally suited for authentic learning and development.

**Implications for Practice**

Structured Play can be an effective way to help adolescents with ASD develop social competence, when supported by adult facilitation and peer models. The combination of interest-based play and structured interactions supports child and adolescent development with few limits to the types of play modalities and toys that can be used. However, for Structured Play programs to be successful with young people with ASD, four key ingredients must be present.

First, the roles in Structured Play require power sharing. The participants must constantly negotiate the tension that is characteristic of power sharing. The participants in Study 1 (as designed by LeGoff, 2004) shared power because only one child had access to the toy at a time. The power sharing in Study 2 could not be based on the toy because all children had equal access to the virtual building blocks. When designing Structured Play for games and activities that do not easily lend themselves to roles, program designers should consider which roles would necessitate co-operation through power sharing.

Second, the play modality must be appropriate to the developmental needs of the children. The Structured Play in Study 1 was accessible for children and adolescents who had limited verbal ability and fine motor skills. Compared to the Structured Play in Study 1, the Structured Play in Study 2 was designed to be appropriate for an older and more
developmentally sophisticated group of young people. The play modality of Study 2 required the participants to be able to use abstract thinking and to possess the fine motor control needed to navigate the iPad interface. Play modalities should be designed in consideration of the cognitive and physical capacities of the participants.

Third, the Structured Play setting needs to provide a predictable environment where the children feel safe. The repetition of the interactions can provide predictable patterns of behaviour by which the youth can reduce their anxiety and feel more comfortable socializing with others. In Study 1, the sequence of social bids in Structured Play created a chain of interactions that provided regular opportunities for the youth to give and receive social bids. In Study 2, the rotation of roles helped adolescents feel comfortable giving and taking orders. While roles can be designed for a variety of play scenarios, the roles should be implemented consistently so that each participant knows what is required.

Finally, Structured Play should be designed to foster self-regulation. During Structured Play, the young person has to ignore the desire to follow personal preferences in order to participate in play, even if following the rules of the play is effortful. The ability to renounce impulsive action and subordinate oneself to the rules is a crucial step towards development (Grolnick, 2009; Vygotsky, 1978; Weidner, Sieverding, & Chesney, 2015). The shift made by the youth with ASD in Study 2, from items and resource blocks of personal interest (immediate impulse) to social interactions (rules of the play), demonstrates how they were able to control impulses and follow the rules of the play. The Structured Play setting created a zone of proximal development for the youth wherein the youth behaved beyond their social capacity and “above [their] daily behaviour” (Vygotsky, p. 102).
Limitations and Implications for Research

There are three overarching limitations to the studies in the dissertation. The first limitation relates to the samples. All three studies included small samples of participants with ASD (12 in Study 1, 4 in Study 2, 12 in Study 3). Small sample sizes are characteristic of studies of people with ASD but reduce the generalization of the findings (Dunst et al., 2011). Other limitations of the samples in the current dissertation related to the sex ratio of participants. The sex ratio of the young participants in the studies (27 males, one female) was disproportionate to the population of youth with ASD, for which the ratio is approximately 5 to 1, male to female (Mottron et al., 2015; Werling & Geschwind, 2013). Also, most of the parents who participated in the current dissertation were mothers, a trend that is common for studies of children with disabilities (Woodgate, Ateah, & Secco, 2008). Despite the predominant trend towards the participation of mothers in research on ASD (Hartley & Schultz, 2015), the voices of fathers should be included when possible because mothers and fathers experience parenting a child with ASD differently (Hirschler-Guttenberg, Feldman, Ostfeld-Etzion, Laor, & Golan, 2015; Hirschler-Guttenberg, Golan, Ostfeld-Etzion, & Feldman, 2015). The findings of future studies would be improved by recruiting larger samples that better reflect the sex ratios of the subpopulation and of parents.

A second limitation of the current dissertation is that measures were not used consistently throughout the studies. For example, learning profiles of the participants with ASD in Studies 2 and 3 were developed using the results of the Social Responsiveness Scale, version 2 (SRS-2) and interviews with the participants with ASD and their parents, whereas profiles in Study 1 were based only on interviews with parents. Social behaviour was video recorded and coded in Study 2 to measure rates of social interactions, but not in Study 1. The
use of similar intervention measures and data collection methods in future studies would make comparisons of the results of studies more cohesive, an important goal in a field where small sample studies are common.

The final limitation of the current dissertation is that the design of the studies did not consistently employ triangulation. Triangulation is a process by which evidence is corroborated through different types of data, methods of data collection, and data sources (Creswell, 2002). The results of Study 1 would have been strengthened if the perspectives of parents and staff on participant development were corroborated by the collection of coded behaviour during sessions (e.g., rates of initiations) and the completion of measures of social responsiveness, such as the SRS-2. The design of Study 2 included coded variables and the SRS-2, but failed to secure respondent validation by presenting the findings to the participants and parents to verify the results. The results of Study 3 would have been improved by member checking (Creswell & Miller, 2000), whereby approval of participants to present direct quotes is sought as a form of confirmation of findings. Additionally, the results of the current dissertation are weakened by the potential for researcher bias in that the results relied primarily on the analyses of one researcher (Onwuegbuzie, 2003; Onwuegbuzie & Leech, 2007). The threat of researcher bias can be reduced by including triangulating data analysis among other researchers or a process of critical self-reflection called interviewing the investigator (Chenail, 2012). In future studies, confirmability of the findings might be improved by triangulating the results more rigorously, an important component of qualitative research (Stoner & Angell, 2006; Stoner, Angell, House, & Bock, 2007).
Final Reflection

Dire descriptions of the social prognoses of young people with ASD can be found in the opening paragraphs of nearly every research article on intervention approaches. Sobering descriptions of lonely childhoods (Bauminger, Shulman, & Agam, 2003; Locke, Shih, Kretzmann, & Kasari, 2015), poor academic skills (Ledford & Wehby, 2015), and missed employment opportunities (Hendricks & Wehman, 2009) are included in intervention literature to emphasize how much these individuals need social programs. As a result, the widely held perception is that, compared to typically developing peers who are perceived to live effortlessly social and happy lives, children and adolescents with ASD are at great risk of living sad, solitary, and unfulfilled social lives.

However, as I near the end of this dissertation exploring social competence intervention programs for these children and adolescents, I find myself pondering the question that I pondered nearly four years ago when I began this process: What is wrong with social intervention programs? At the beginning of this process, I wanted to know how I could improve social programs for youth with ASD. I worked through the major issues and tried to resolve some of the challenges faced by those who want to help these young people socialize more effectively. Over the course of my work, I have come to the realization that the social programs as currently designed may contain fundamental flaws. I am not the only one who has faced this realization. Indeed, it has been widely acknowledged throughout the literature that social intervention programs do not always work well (Dunst, Trivette, & Hamby, 2007; Koegel & Koegel, 2012; Ozonoff, Goodlin-Jones, & Solomon, 2005; Reichow & Volkmar, 2010; White, Keonig, & Scáhill, 2007). Even when youth with ASD make gains on the variables that have been chosen as proxies for social competence, it is not
often that they make subsequent improvements in their abilities to initiate and sustain meaningful relationships (Bellini, Peters, Benner, & Hopf, 2007).

The ineffectiveness of social interventions to make meaningful change in the lives of youth with ASD is a contentious issue in the field. In recognizing the problems, researchers have suggested multiple ways to improve social programs including: increase parental involvement (Brookman-Frazee, 2004), use interests (Koegel, Bradshaw, Ashbaugh, & Koegel, 2013), include evidence-based practices (Ratcliffe, Wong, Dossetor, & Hayes, 2014), and incorporate small group instruction (Ledford & Wehby, 2015). They have debated which doses, settings, and modes of delivery might fix intervention programs (Hume, Bellini, & Pratt, 2005). My studies in the current dissertation were also designed to highlight perceived problems with intervention studies (community-based programs do not include enough purposeful application of evidence-based strategies, Studies 1 and 2; parental involvement and socially valid features are ignored by program designers, Study 3).

Yet another explanation might better explain some of the ineffectiveness of intervention programs. Perhaps part of the reason why social programs fail to make meaningful changes in the lives of youth with ASD is the programs are designed to accomplish the wrong goals. Social programs are designed to fix the social capacity of youth with ASD because program design decisions are based on the assumption that the socializing of typically developing peers is better than that of individuals with ASD. Despite how pervasive is the idea that normal is “better” in the intervention literature, it may not always be true.

What is often overlooked by the social intervention literature, especially in reviews of the literature, is that, while the social lives of children and adolescents with ASD are
different than those of their typically developing peers, their social lives are not always failures. While they tend to socialize less often, and with fewer people, than do typically developing peers (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011), those differences do not necessarily mean that they cannot and do not socialize. Despite the perception of young people with ASD as isolates, most of them are able to establish social connections with peers in school and community settings (Boutot & Bryant, 2005; Chamberlain, Kasari, & Rotheram-Fuller, 2007). While they tend to be further from the centre of their social networks than are typically developing peers, youth with ASD are recognized participants in their social networks (Rotheram-Fuller et al., 2010). Many children and adolescents with ASD have at least one good friend (Locke, Ishijma, Kasari, & London, 2010) and can be thereby protected from the worst effects of loneliness and peer victimization (Waldrip, Malcolm, & Jensen-Campbell, 2008). A seminal study on social networks of youth with ASD by Bauminger, Shulman, and Agam (2003) showed that, even though they participated in fewer interactions than did typically developing classmates, the proportion of positive to negative social behaviours was similar for both groups. In short, although the friendships of youth with ASD are not the same as those held by typically developing peers, those youth are social and capable of having social ties.

Therefore, the first step to improving social programs for young people with ASD may be to understand that, while their socializing tends to be different from that of typically developing peers, it can still be fulfilling and meaningful for them. The second step to improving programs may be to acknowledge that social programs often fail to improve the youths’ social skills and that, even when some gains can be made, the association between social competence and improved social cohesion is tenuous (Bauminger et al., 2003).
Perhaps what researchers and educators need to do is to stop designing programs to try to make the social lives of youth with ASD normal, and start designing programs that will make their lives better. Researchers and educators have been so dedicated to outcome goals that they have failed to answer the most important question: What do youth with ASD actually need to live socially successful and integrated lives?

Moving Forward

The studies in the current dissertation, especially Studies 1 and 2, were based somewhat on the assumption that children and adolescents with ASD would be happier and better if they could socialize more like their typically developing peers, a position that may be less persuasive in light of what is currently known about their socializing. Instead of designing programs to normalize their socializing, children and adolescents with ASD may benefit from the development of social contexts where they can thrive. The study of thriving moves beyond the deficit-based goal of fixing problems and looks to determine what is necessary for holistic and genuine wellbeing. In the case of socializing, interventions should recognize that differences in socializing do not necessarily mean deficits in socializing and that, when in contexts that promote thriving, all young people can live healthful and happy lives. When engaged in the play-based interventions in Studies 1 and 2, participants tended to take part in rich socializing that, over the span of the sessions, emphasized teamwork and the perspectives of others over their individual and personal preferences. In this way, even if the current studies were based on normative models of socializing, the results of the studies in the current dissertation appear to speak to the goals of creating contexts where youth with ASD could thrive. Future research should focus on identifying the program features that best
support the development and social wellbeing of children and adolescents with ASD,
without falling into the trap of assuming that normal socializing is best.
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March 11, 2013

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GREB Ref #: GEDUC-663-13; Romeo # 6007827
Title: "GEDUC-663-13 The LEGO Program"

Dear Mr. MacCormack:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GEDUC-663-13 The LEGO Program" for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen's ethics policies. In accordance with the TCPS (article D.1.6) and Senate Terms of Reference (article G), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB, of any adverse event(s) that occur during this one year period (access this form at https://services.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes to the level of risk, applicants' characteristics, and implementation of new procedures. To make an amendment, access the application at https://services.queensu.ca/romeo_researcher/ and click Events - GREB Amendment to Approved Study Form. These changes will automatically be sent to the Ethics Coordinator, Gail Irving, at the Office of Research Services or erigg@queensu.ca for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

John B. Freeman, Ph.D.
Professor and Acting Chair
General Research Ethics Board

cc: Dr. John Freeman, Faculty Supervisor
Dr. Den Klinger, Chair, Unit REB
Erin Wickham, c/o Graduate Studies and Bureau of Research
March 25, 2015

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GREB Ref #: GEDUC-779-15; Romeo # 6015101
Title: “CEDUC-770-18 MINECRAFT Club”

Dear Mr. MacCormack:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled “GEDUC-779-15 MINECRAFT Club” for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen’s ethics policies. In accordance with the Tri-Council Guidelines (article D.1.6) and Senate Terms of Reference (article 2), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB, of any adverse event(s) that occur during this one year period (access this form at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

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On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, Ph.D.
Chair
General Research Ethics Board

c: Dr. John Freeman, Faculty Supervisor
Dr. Chris DeLuca, Chair, Unit REB
Ms. Erin Wickham, c/o Graduate Studies and Bureau of Research
APPENDIX C

August 27, 2015

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GREB Ref #: GEDUC-781-15; Romeo #6016310
Title: "GEDUC-781-15 Perceptions of Programs and Services Interviews"

Dear Mr. MacCormack:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GEDUC-781-15 Perceptions of Programs and Services Interviews" for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen’s ethics policies. In accordance with the Tri-Council Guidelines (article D.1.6) and Senate Terms of Reference (article G), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB, of any adverse event(s) that occurred during this one year period (access this form at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unanticipated event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

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On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

[Signature]

Joan Stevenson, Ph.D.
Chair
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Ms. Erin Wickram, c/o Graduate Studies and Bureau of Research