COMMUNICATION SKILLS DEVELOPMENT AFTER A DRAMA PROGRAM FOR CHILDREN WITH SOCIAL-PRAGMATIC COMMUNICATION DIFFICULTIES

by

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Abstract

The current study set out to describe a drama-based group intervention (Interact) for children with social (pragmatic) communication difficulties and examine the outcomes, with a particular focus on methodologies suitable to measuring potential change. Those with difficulties in this area may have limitations in the skills that are important for achieving successful interactions with others. As a result, they are likely to struggle to develop and maintain meaningful relationships and are at a higher risk of being socially isolated or depressed. InterAct was conducted over 10 weeks and utilized scripting, storytelling and improvisation. The overarching goals of the program were for the children to develop: (1) more effective social behaviour and interaction; (2) greater socio-emotional awareness of themselves and others, including skills in modulation of their own communication; and (3) more confidence in their communication abilities. Participants were between the ages of 6 and 9 years and had a range of conditions affecting social communication: autism spectrum disorder (ASD), complex developmental behaviour disorder, social anxiety and/or more global developmental delays (n=6). Because there is no consensus on how to evaluate social (pragmatic) communication, outcomes were assessed using a range of standardized tests and non-standard measures of social cognition and behaviour, including communication samples, a false-belief task, Goal Attainment Scaling (GAS: Kiresuk & Sherman, 1968), a parent-report questionnaire and participant interviews. Results suggest that some participants in the InterAct program showed gains in inferencing, flexible thinking and emotional embodiment, including improvement on a false-belief task. No change was observed for recognition of non-social emotions due to pre-program ceiling effects. Parents and participants indicated satisfaction with the program. Participant feedback indicated highlights in: (1) activities and games; (2) forming meaningful relationships;
and (3) self-assurance. Additionally, gains were made in observed social communication, as measured by Goal Attainment Scaling (GAS). Overall, the findings show promising results for use of drama as a form of speech-language therapy for children with social skill deficits. This study discussed methodological considerations for future studies, including the potential for GAS to capture progress in social communication.
Preface

The following presents a thesis project at the University of British Columbia (UBC) conducted by a graduate student in Speech-Language Pathology, which will hereafter be referred to as the primary investigator. The UBC Behavioural Research Ethics Board approved the study (H15-01546). The study was conducted under the supervision of the students’ thesis committee comprising of two academic faculty members who are also Speech-Language Pathologists (SLPs). The primary goal of the study was to see if children with social-pragmatic difficulties, after participating in a 10-week drama-based intervention, InterAct, would show improved social communication skills. Most importantly, the study sought to explore which methodology would be most appropriate in order to capture such progress. In order to do this, the study utilized a pilot general case-study design. The InterAct program leaders (one of whom is Clinical Faculty with the School of Audiology and Speech Sciences at UBC) were involved as study consultants. Drama therapy has been proposed as one treatment option, with some promising results for children with social-pragmatic difficulties. However, the research to date is limited. The aim of this study was to further add to this literature and to our knowledge, be the first of its kind from a speech and language perspective. Chapter 1 outlines the theoretical components of the social framework, focusing on social cognition and behaviour. In addition, definitions of social-pragmatic communication and related deficits are provided. Current and proposed treatment approaches are discussed and concluded with a literature review. Chapter 2 describes measures and procedures used to collect data and provide descriptions of the intervention and participants. Chapter 3 summarizes the results and Chapter 4 discusses the same, including future research and clinical implication.
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<th>Description</th>
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<tbody>
<tr>
<td>ADHD</td>
<td>Attention Deficit Hyperactivity Disorder</td>
</tr>
<tr>
<td>AS</td>
<td>Asperger Syndrome</td>
</tr>
<tr>
<td>ASD</td>
<td>Autism Spectrum Disorder</td>
</tr>
<tr>
<td>BASC</td>
<td>Behavioural Assessment System for Children</td>
</tr>
<tr>
<td>BDI-Y</td>
<td>Beck Depression Inventory – Youth</td>
</tr>
<tr>
<td>CBC</td>
<td>Child Behaviour Checklist</td>
</tr>
<tr>
<td>CCC-2</td>
<td>Children’s Communication Checklist 2</td>
</tr>
<tr>
<td>DANVA-2</td>
<td>Diagnostic Analysis of Nonverbal Accuracy 2</td>
</tr>
<tr>
<td>DSM-5</td>
<td>Diagnostic and Statistical Manual of Mental Disorders 5th Edition</td>
</tr>
<tr>
<td>EDI</td>
<td>Emory Dyslexia Index</td>
</tr>
<tr>
<td>fMRI</td>
<td>Functional Magnetic Resonance</td>
</tr>
<tr>
<td>GAS</td>
<td>Goal Attainment Scaling</td>
</tr>
<tr>
<td>GCC</td>
<td>General Communication Composite</td>
</tr>
<tr>
<td>ID</td>
<td>Intellectual Disability</td>
</tr>
<tr>
<td>NLD</td>
<td>Nonverbal Learning Disability</td>
</tr>
<tr>
<td>NTW</td>
<td>Number of Total Words</td>
</tr>
<tr>
<td>SALT</td>
<td>Systematic Analysis of Language Transcripts</td>
</tr>
<tr>
<td>SCD</td>
<td>Social Communication Disorder</td>
</tr>
<tr>
<td>SCIP</td>
<td>Social Competence Intervention Program</td>
</tr>
<tr>
<td>SDARI</td>
<td>Socio-Dramatic Affective-Relational Intervention</td>
</tr>
<tr>
<td>SIDI</td>
<td>Social Interaction Difference Index</td>
</tr>
<tr>
<td>SLDT-E</td>
<td>Social Language Development Test-Elementary</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>--------------</td>
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<tr>
<td>SLI</td>
<td>Specific Language Impairment</td>
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<tr>
<td>SRS</td>
<td>Social Responsiveness Scale</td>
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<tr>
<td>SSRS</td>
<td>Social Skills Rating System</td>
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<tr>
<td>TLC</td>
<td>Test of Language Competence</td>
</tr>
<tr>
<td>TTR</td>
<td>Type-Token Ratio</td>
</tr>
<tr>
<td>UBC</td>
<td>University of British Columbia</td>
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</table>
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Lastly, to my parents who have supported me throughout my education, you have given me the tools to persevere!
Dedication

This thesis is dedicated to my sister who left this world too soon, who had a love for musical and improvisational theatre. She sparked my interest in this field and taught me patience and compassion for others with similar challenges. There won’t be a day that goes by where I won’t miss her contentious laugh or tremendous sense of humour. She will forever be my inspiration to continue to play and explore.
Chapter 1: Introduction

The following thesis is a study of drama therapy in remediation of social skills in children with social communication deficits. Chapter 1 begins with an introduction to the research topic, and a summary of definitions and issues involved with social communication deficits. Therapeutic approaches to such difficulties are reviewed, with a particular focus on previous research in drama therapy for social skill development. Chapter 1 ends with general research questions and predictions for the study.

1.1 Social (Pragmatic) Communication

Social (pragmatic) communication is a general term to describe how one interacts with others on a daily basis (Kennedy & Adolphs, 2012). To date, there is no consensus in the research literature on how to quantify, measure and treat social (pragmatic) communication. A number of conditions can lead to deficits in social communication, for instance, Social Communication Disorder (SCD), Autism Spectrum Disorder (ASD) and Social Anxiety. Autism Spectrum Disorder is one of the most common conditions affecting social communication, is also the most commonly neurological disorder diagnosed in Canada. One in every 68 children is currently diagnosed with ASD, a doubling of assumed prevalence over the past 10 years (Autism Speaks Canada, 2016). With the increased possible prevalence in social communication deficits, more information is essential in this area. Further description of ASD and other conditions affecting social communication are presented following a discussion of social competence.

In order to measure social (pragmatic) communication, one needs to determine what governs social-pragmatic communication. Kennedy and Adolphs (2012) suggest that social communication is facilitated by social competence or how well an individual can form relations
with others (Kennedy & Adolphs, 2012). Social competence includes the ability to internally assess the situation, perceive the behavior and social cues of others and then externally adapt, initiate or respond appropriately (Guli, Semrud-Clikeman, Lerner & Britton, 2013) and is further elaborated below.

1.2 The Social Competence Framework

Corbett et al. (2015) introduced a social competence framework where they propose that the brain facilitates social cognition, which produces one’s social behavior and over time, determines social functioning. This model was first introduced in a review by Kennedy and Adolphs (2012) who present it as a way to understand social communication deficits. This model is not unidirectional; relationships between the different levels can also be bidirectional. For instance, changes in social functioning over time can have an effect on brain function and as a consequence, affect social cognition. The proposed levels of the social competence framework are defined further below. Of particular interest to this present study are social cognition and social behaviour. The social processes within the brain, briefly discussed below, make social cognition and social behaviour possible.

1.2.1 Social Processes Within the Brain

The brain contains structures that serve social processes, many of which are often described in a domain-specific way (Kennedy & Adolphs, 2012). For instance, the temporal lobe has been indicated to play a role in facial processing, and the temporo-parietal junction and medial prefrontal cortex in perspective-taking (Kennedy & Adolphs, 2012). Functional Magnetic Resonance (fMRI) studies have measured these specific areas in relation to social processing (although a review of fMRI studies is beyond the scope of this thesis). Individual brains differ in many ways, but changes or damage to the brain can cause difficulties
1.2.2 Social Cognition

Social cognition is the ability to process information about others, including oneself, and underlies social abilities and behaviour (Beer & Ochsner, 2006; Kennedy & Adolphs, 2012). Included in social cognition are cognitive processing functions like perception, reasoning, memory, attention, motivation and decision-making. None of these processes are unique to just social cognition, but the term ‘social’ in front of cognition implies that these processes concern relations with other people (Beer & Ochsner, 2006; Kennedy & Adolphs, 2012). During development, the maturation of social cognition is gradual and involves skills such as joint attention and thinking from someone else’s perspective (or theory of mind). Theory of mind is the ability to recognize mental states and understand distinctions between the self and other people (Beer & Ochsner, 2006). For instance, a 6-year-old child may be talking to a parent who is in another room. The parent then asks what s/he is doing and the child responds, “playing with my firetruck”. Here, the child demonstrates “theory of mind” because s/he recognizes that the parent cannot see what is going on and makes sure to give adequate information instead of saying something like, “playing with this”. In a typically developing child, theory of mind is assumed to be an innate process that is established through joint attention, use of mental state language and pretend play (Frith, Happe, Siddons, 1994). According to Zufferey (2010), theory of mind is essential for social communication. It allows one: (1) to understand and predict the knowledge, beliefs, emotions and desires of the communication partner; and (2) to express relevant, adequate information in an appropriate way to the listener (de Villiers & de Villiers. 2014; Zufferey, 2010).
A number of developments lead to a well-established theory of mind. Between the ages of 6 and 18 months of age, children begin to develop joint attention and the ability to discriminate between pictures of different emotions (Happe & Frith, 2004). According to Happe and Frith (2004) these abilities permit social referencing, the act of first looking at parent’s emotions before acting. The child is able to be flexible and shift his attention. Flexible thinking refers to the ability to adapt to new situations, look at things differently, and think of different outcomes and solutions. These skills have been shown to be predictive of adaptive and social functioning (Williams, Mazefsky, Walker, Minshew, Goldstein, 2014).

In terms of recognizing emotional states in oneself and others, by 18 to 24 months of age, children start to use language to refer to their own emotions (Owens, 2012). Around 2 to 3 years of age, when shown a picture, children start to label simple emotions (Michaelson & Lewis, 1985). Emotions can either be social or non-social (Williams & Happe, 2010). Non-social emotions are basic emotions that develop early like anger, sadness, surprise, fear and happiness (Izard, 1971). Social emotions emerge from cultural context (Williams & Happe, 2010). Examples of social emotions are embarrassment, pride, disappointment and guilt. Expressing emotions is important for social interactions because doing so signals internal feelings, states and contributes to social reciprocity (Begeer, Koot, Rieffe, Terwogt, & Stegge, 2008).

Further to theory of mind development are pretend play and awareness of mental and emotional states in others. Pretend play develops between the ages of 3 to 4: children start to assume different roles (Nicolopoulou & Richer, 2007). In the narratives of children 4 years of age, they demonstrate the ability to talk about the mental states and reactions of characters (Nicolopoulou & Richer, 2007). At the same time, children of 4 years also start using more language referring to the internal states of others such as know, want, believe, etc. Although not
fully developed, the simplest of theory of mind tasks, such as false belief tasks, are often achieved by 4 years of age when children understand that others have thoughts and feelings that are different from their own (Zufferey, 2010). By age 5 years, a child will learn to predict emotions that people might have in certain situations (Michaelson & Lewis, 1985). Prediction requires the ability to make inferences, or the integration of what you know with what you see in order to make an educated guess about what is happening (Botting & Adams, 2005). Social inferencing is important for communication because one must predict and understand other’s behaviour in order to know how to appropriately address a situation. One has to infer the intentions of the speaker, as it contributes to understanding the meaning behind a phrase or sentence. Inferencing contributes to one’s ability to comprehend sarcasm, jokes, metaphors, irony and even lying (Russell, 2007).

When theory of mind does not develop as expected, there can be effects on discourse (social communication). In a longitudinal study with children with ASD (ages 4 to 13 years), Hale and Tager-Flusberg (2005) found that theory of mind abilities were correlated with gains in maintaining the topic of conversation. Brown and Klein (2011) found similar correlations between theory of mind and writing samples of adults with Asperger Syndrome (AS) and ASD compared with those of neurotypical adults (Brown & Klein, 2011), i.e. specifically in length of text and quality of narrative and expository samples. Zufferey (2010) has proposed that many underlying deficits in social communication can in fact be attributed to theory of mind.

1.2.3 Social Behaviour

Social behavior can be defined as actions that are observable during interactions with others (Kennedy & Adolphs, 2012) and that result from aspects of social cognition. Social behaviours are both verbal and nonverbal. Verbal components include

1.2.4 Social Functioning

Both social cognition and behavior underlie social functioning, which is how one navigates through one's social world on a day to day basis (Kennedy & Adolphs, 2012). Difficulties in social functioning are sometimes attributed to neurological or psychiatric developmental disorders such as ASD. We turn now to measurement of social competence.

1.2.5 Social Competence: Evaluation and Deficits

Social cognition has been measured through tasks that involve the domains mentioned above involving executive functions such as inferencing, face perception, emotional recognition, regulation and theory of mind. Social Behaviour is usually measured by observing someone with others in a specific situation or context (Kennedy & Adolphs, 2012). Social functioning is normally measured through a questionnaire or assessment scale and completed over a period of time (Kennedy & Adolphs, 2012).

As noted, individuals with lacks in social competence often experience social-pragmatic communication difficulties. Social-pragmatic communication difficulties may include struggles with using language for various purposes, altering language depending on the context or difficulty following the rules of communication (Russell, 2007). These areas could include verbal and nonverbal aspects of communication (American Psychiatric Association, 2013). Diagnostic criteria for a Social Communication Disorder (SCD) and ASD are specifically described in the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5)
Persistent difficulties in the social use of verbal and nonverbal communication as manifested by all of the following:

1. Deficits in using communication for social purposes, such as greeting and sharing information, in a manner that is appropriate for the social context.

2. Impairment of the ability to change communication to match context or the needs of the listener, such as speaking differently in a classroom than on the playground, talking differently to a child than to an adult, and avoiding use of overly formal language.

3. Difficulties following rules for conversation and storytelling, such as taking turns in conversation, rephrasing when misunderstood, and knowing how to use verbal and nonverbal signals to regulate interaction.

4. Difficulties understanding what is not explicitly stated (e.g., making inferences) and nonliteral or ambiguous meanings of language (e.g., idioms, humor, metaphors, multiple meanings that depend on the context for interpretation).

The deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination.

The onset of the symptoms is in the early developmental period (but deficits may not become fully manifest until social communication demands exceed limited capacities).

The symptoms are not attributable to another medical or neurological condition or to low abilities in the domains of word structure and grammar, and are not better explained by autism spectrum disorder, intellectual disability (intellectual developmental disorder), global developmental delay, or another mental disorder. 315.39 (F80.89)

Autism Spectrum Disorder (ASD) is another diagnosis with a primary deficit social-pragmatic communication. According to the DSM-5 (American Psychiatric Association, 2013), the diagnostic criteria for ASD includes:

Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are
illustrative, not exhaustive, see text):

1. **Deficits in social-emotional reciprocity**, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.

2. **Deficits in nonverbal communicative behaviors used for social interaction**, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. **Deficits in developing, maintaining, and understanding relationships**, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. **Insistence on sameness, inflexible adherence to routines**, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g, strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest).

4. Hyper- or hyporeactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. **Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.**
E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level 299.00 (F84.0).

As noted, social-pragmatic difficulties are primary deficits in both SCD and ASD (Frith, et al., 1994). However, even though all children with SCD and ASD have social-pragmatic difficulties, not all children with social-pragmatic difficulties have the diagnosis of SCD or ASD, for example, children with social anxiety disorders or selective mutism (American Psychiatric Association, 2013). Social-pragmatic deficits can also be secondary deficits in children with Attention Deficit Hyperactivity Disorder (ADHD), Intellectual Disabilities (ID), Developmental Delays and Specific Language Impairment (SLI) (Happe & Frith, 2004).

Those with social-pragmatic communication difficulties may have limitations in the skills that are important for achieving successful interactions with others. As a result, individuals with social-pragmatic difficulties are more likely to struggle to develop and maintain meaningful relationships and are at a higher risk of being socially isolated or depressed (Epp, 2008).

Based on what we know about the social framework model, one can suspect then, that the social framework in a child with a social-pragmatic impairment is different from that of typically developing child. According to Frith, et al. (1994), in a child with ASD, brain dysfunction affects social cognition.

1.2.5.1 Deficits in Social Competence

Linking deficits in social competence to the discussion on social cognition, Zufferey (2010) and Frith et al. (1994) suggest that many of the pragmatic deficits in individuals with ASD can be accounted for by an inability to represent mental states. According to Frith (1989), individuals with ASD lack theory of mind; they have difficulty with perspective-taking and...
“putting themselves in someone else’s shoes”. A meta-analysis by Frith (2012) found that children with ASD generally pass the false belief task 5 years later than typically developing peers, meaning that they are more likely to be around the age of 9 rather than 4 years. Individuals with ASD are generally considered to be 'rigid' thinkers. As a result, they have difficulty understanding and predicting the emotions, thoughts and feelings of others. Flexible thinking is generally correlated with problem-solving and reasoning ability, which can be different within individuals with ASD (Williams et al. 2014).

Inferencing deficits have also been associated with people with high-functioning autism (Norbury & Bishop, 2002; Minshew, Goldstein, & Siegel, 1995; Botting & Adams, 2005). Minshew et al. (1995) found that adolescents with high-functioning autism performed at lower levels than typically developing peers on subtests of the Test of Language Competence (TLC: Wiig & Secord, 1985), which requires children to make inferences and interpret figurative language. Happe (1994) showed that children with high-functioning autism had difficulty comprehending stories based on their inability to infer character’s mental states (Happe, 1994). Norbury and Bishop (2002) studied children between the ages of 6 and 10 years, with specific language impairment, pragmatic impairments and ASD and found that these children had greater difficulties comprehending stories based on their an inability to make inference as compared with typically developing peers.

In another aspect of social cognition, emotion recognition, Williams and Happe (2010) found that children with ASD had more difficulty identifying social emotions than non-social, although not when overall performance was compared with that of the typically developing control group. In fact, a recent meta-analysis has found that emotion recognition is only a slight deficit in ASD when data are compared with those of control groups (Uljarevic & Hamilton,
In order for emotion recognition to be a primary deficit it needs to be seen globally, and that was not the case as a result of this review. With these findings in mind, Kasari, Shire, Factor, and McCracken (2014) propose that it is not so much emotion recognition that is a major deficit but rather, emotion regulation, that is, how one manages or responds to emotional experiences. Emotion regulation demands a level of flexibility in order to be able to adapt to different situations and demands of the environment in a socially accepted way. Emotion regulation is more complex than just labeling an emotion, and relies more on understanding the perspective of oneself and another (Kasari et al., 2014).

Relative to emotions and theory of mind, the latter has been assumed to involve reading and understanding the emotions, beliefs and feelings of others. However, the ability to recognize emotions in others is correlated with the ability to report (and regulate) one’s own emotional states (Happe & Frith, 2014), as is suggested by the implications of the meta-analysis above. Children with anxiety and autism have demonstrated alexithymia, and difficulty in expressing and reflecting on their own emotions (Happe & Frith, 2014). Likewise, school-aged children with ASD have been found to be less expressive and show flatter affect when compared with children with intellectual disability or typically developing peers (Yirmiya, Kasari, Sigman, & Mundy, 1989). Individuals with ASD may also be less responsive or their emotional responses may be more extreme (Yirmiya et al., 1989). This deficit in nonverbal communication can have implications for social functioning. The behavior of individuals with ASD may appear immature or discourteous due to their own lack of emotional self-regulation and their inability to take the thoughts or feelings of others into account more than is typical for their culture or age group. Thus, interventions for addressing such issues are highly recommended, as discussed below (Rao, Beidel, Murray, 2008).
1.3 Approaches to Intervention for People with Social-Pragmatic Deficits

There are a variety of approaches to addressing social-pragmatic difficulties. Here, the most common are described. Because the most prominent deficit seen in ASD is an impairment in social-pragmatic communication, much of the research done on social-pragmatic interventions have been done with children with ASD. Social learning approaches discussed here will be Social Stories, Social Scripts, Video Modeling and Social Skills Groups.

1.3.1 Social Stories

Social Stories were first created by Carol Gray in 1990 who started her career as a teacher for children with ASD. A social story is a short story written to target a specific situation, behavior or notion with the goal of a child learning pertinent social information (Karkhaneh et al., 2010). Social stories vary in the way they are presented to a client. They can be read either by the client or a caregiver or presented auditorily or visually. Children are then monitored for a change in the frequency or intensity of the targeted behaviour. Karkhaneh et al. (2010) conducted a systematic review of the literature on social stories and their effectiveness as a treatment for the social-pragmatic deficits of ASD. Karkhaneh et al. (2010) found that five out of six studies reviewed showed statistically significant short-term benefits for using social stories for social interaction intervention; however they note that more research is needed in order to further understand maintenance and generalization of treatment.

1.3.2 Social Scripts

Social scripts can be used to teach a variety of different social skills based on the client’s social abilities and needs. Social scripts are similar to Social Stories. They both involve a social narrative; however unlike social stories, social scripts provide instruction on what to do in a social situation. Social scripts give the client the direct opportunity to practice and learn social
skills and behaviors that are pertinent for those circumstances. A variety of skills can be targeted such as making relevant contributions, making accepted eye contact, respectfully disagreeing with others or learning to participate in a group setting (Miller, 2007). Well-known events or situations are scripted. The client learns the script through modeling and is given the opportunity to practice through role-playing. Feedback is provided. Verbal and visual cues may be used while the client learns the script, such as saying “look at me” or pointing to one’s eyes to direct client’s gaze direction. The aim is to fade cues as the client becomes more proficient, so that the child’s social communication can become more spontaneous (Ganz, Kaylor, Bourgeois, Hadden, 2008). The assumption of scripts is that the skills learned during role-play will transfer to similar situations. Preliminary studies have found that using social scripts can help increase initiations with peers, responses and decrease perseverative or off-topic language (Krantz & McClannahan, 1998; Ganz et al., 2008). Krantz and McClannahan (1998), who studied three children aged 4 to 5 years and with severe developmental disabilities, also found that after scripts were faded, not only did spontaneous conversations continue but skill generalization to other settings outside of the treatment environment took place.

1.3.3 Video Modeling

Video modeling has shown to be another effective approach for teaching social skills to a client with ASD (Nikopoulos & Keenan, 2003; Sherer et al., 2001). The client is provided with a video recording of socially effective behaviours with the goal of changing their interactions (Grant & Evans, 1994). Behaviours modeled in the video recordings are those that the intervener wants the client to imitate. The client learns through observation and repetition. Behaviours are then modeled in the client’s environment and as they become more imitative, the behaviour is then practiced with a variety of settings, people and time in order to help promote generalization.
Eventually it is expected that the client will use these behaviours in a naturalistic setting. Nikopoulos and Keenan (2003) conducted a study using video modeling training in order to enhance the social interaction skills of seven participants with severe developmental learning disabilities between the ages of 9 and 15 years. They found that four out of the seven participants showed improvement on social interaction and play skills and that they generalized across settings, with various peers and toys.

1.3.4 Social Skill Groups

The above methods can be used for individuals or groups. Social skills groups are sometimes used to help improve verbal and nonverbal communication impairments, increase quality and quantity of peer relationships, improve emotional recognition and regulation, develop problem solving skills in relation to social interactions and address secondary difficulties that may be associated with mental illness (Spain & Blainey, 2015). Social skills groups have many advantages over individualized therapy. Given that the impairment is social, practicing these skills within a group context gives an individual the opportunity to practice with peers. Another advantage is that social skills groups can provide positive interactions, promote peer relationships and reduce the risk of social isolation (Spain & Blainey, 2015). Williams, Milner and Haslam (2013) summarized the findings of five randomized trials from the United States on social skills groups. Improved social competence and friendship quality was found for some children with ASD between the ages of 6 and 21 years of age. However, these studies provided inconsistent evidence on measures of social communication, emotional recognition and quality of life measures (Williams, et al., 2013). There was also no known evidence of generalization or maintenance of these skills over time (Williams, et al., 2013). Similarly, Spain and Blainey (2016) conducted a systematic review to determine the effectiveness of social skill interventions.
for adults with high functioning autism and found that the most effective interventions were
group-based as opposed to individual. As a word of caution however, Rao et al. (2008) note that
within social skill groups there is heterogeneity and without examination of individual needs
within the group, an intervention may be ineffective for some participants.

1.4 Drama Therapy Groups

One particular type of group involves drama therapy. Investigators are starting to examine the potential for drama therapy group programs in addressing social-pragmatic deficits. Drama therapy has been around since the 1970s, but only now is gaining attention as a potential social skill intervention for those with ASD (Chasen, 2011). According to the National Autistic Society (2012), drama therapy may be particularly effective for children with social-pragmatic deficits. It incorporates many of the positive aspects of the above treatment approaches, that is, scripts, role play, storytelling and group therapy. The following discussion outlines some of the general reported advantages of drama therapy, with a more in-depth review of relevant studies for the current research in 1.4.1 and 1.4.2.

Drama activities are interactional and communicative and mimic the back and forth, give and take relationship of social interaction (Spolin, 1986). In addition, drama activities replicate this social interaction within a supported environment (Lerner, Mikami & Levine, 2011). Godfrey and Haythrone (2013) determined that drama helps strengthen social skills in children with ASD through semi-structured exercises, because it encourages the expression of feelings and thoughts. Verbal and nonverbal skills are explored as participants learn to manipulate and gain awareness of their voice and body (Spolin, 1986). According to Schneider (2007), drama exercises train actors to accurately read nonverbal cues, something that is noted to be a major
deficit in ASD and related disorders. Participants are given numerous opportunities to rehearse and refine skills (Learner et al., 2011).

Not only are drama activities highly interactional, they also allow for recognition and expression of feelings (Chasen, 2011). Drama activities rely on the ability to read and understand the social cues of others; not only what is said but also how it is said, understanding prosody, facial expression and body language. These social skills are prerequisite for social communication. They require rehearsal and practice and are often targeted through role-play, which facilitates the development of social perception and perspective taking (Guli et al., 2013). Improvisation and scripted acting are used to explore interpersonal relationships and develop social skills through play and pretend (Johnson, Emunah, & Thomas, 2009). These methods can help improve social skills but also emotional awareness of oneself and others (Pimpas, 2013). Drama therapy widens the range of social perception because it requires an individual with social-pragmatic difficulties to put themselves in other people’s shoes when they play and observe different roles (Chasen, 2011). Through dramatic exercises, participants are able to embody past or future events, and rehearse these skills in a safe and supported environment (Godfrey & Haythrone, 2013).

It can be theorized that role-play facilitates perspective taking. In typically developing children aged 33 months, a correlation was noted between a child’s ability to role-play in pretend play and their ability to pass theory of mind tasks (Youngblade & Dunn, 1995). In order to portray different characters and assume a role, one requires an understanding of that person’s mental and emotional status. The way that actors move their body or choose to manipulate their voice and body steams from their beliefs of the character’s thoughts and feelings (Goldstein, 2011).
Drama can also facilitate relationships with others (Godfrey & Haythrone, 2013). Arts in general have been found to reduced isolation and anxiety and enhance self-esteem and confidence (McGarry & Prince, 1998). Participants feel like active contributors and a part of a group, i.e. included, accepted and understood (Andersen-Warren, 2013).

Chasen (2011) claims that even people with severe autism can benefit from drama therapy. Typical behavioural therapies tend to diminish playfulness that comes with development whereby drama is playful, amusing and facilitates humour (Chasen, 2011). The following discussion reviews studies of drama therapy more in depth.

1.4.1 Qualitative Studies of Drama Research

Andersen-Warren (2013) circulated a questionnaire to 84 drama therapists, 32 of whom returned the completed questionnaire, in order to find out if drama therapy was an effective intervention for children and young adults with ASD. The aim of the study was to find out in what settings were drama therapists delivered therapy, what assessment and outcome measures were used to evaluate progress, the range of difficulties experienced by clients, their responses to treatment and the range of interventions utilized. The questionnaire contained open and closed questions. In terms of experience, drama therapists ranged from 1 year to 30 years experience working with this population. Drama therapists worked in a variety of settings, i.e. special education centers to private practice. Most delivered therapy individually and within a group setting (54%), 23% worked with clients one on one, and 23% worked with clients exclusively in groups. All drama therapists indicating worked with children with a variety of psychosocial, neurodevelopmental, mental health and behavioural difficulties. In terms of assessment and evaluation of skills, most drama therapists utilized strengths and difficulties questionnaires and developmental interviews. In terms of responses to treatment, several themes were identified,
among them: (1) Reflection and cognition: the ability for the client to understand another’s thoughts and feelings; (2) Communication: the ability to effectively express emotions to others; (3) Group Support/Interaction: individuals with ASD felt safe and supported by peer relationships (p. 16). However, it is important to note the limitations to this study. Firstly, some quantitative information was provided but the main investigation was qualitative. In terms of the themes reported, many were testimonials and not quantitative information so one cannot conclude exactly how many drama therapists reported certain themes. There is also no mentioned of the range of how old these children and youth were that drama therapists work with. Lastly, the sample size was small so generalization is limited.

Godfrey and Haythrone (2013) conducted a qualitative study that explored the benefits of a drama therapy program, “Roundabout”, for children and young adults with ASD. Roundabout was a weekly program taking place over the span of 11 weeks. Goals of the program included increasing individual confidence, self-esteem, creativity, ability to relate to others, turn taking, social communication skills and mental health. Sessions were either group-based (usually three to four people) or individually-based, where a drama therapist worked one-on-one with a client. The session itself was structured the same every week to try and eliminate anxiety that may come with change, but the overall focus or theme for each session changed from week to week. Examples of themes included storytelling, movement work, saying hello and goodbye etc. Participants in the qualitative study were parents, support workers and teachers who were asked to report any feedback relating to their child or client’s behaviour weekly throughout the program. In total, the researchers received 42 pieces of written feedback. These observations were not limited to the therapy sessions, but also included comments on their behavior outside of the program, for instance, on behavior on the playground, at school or at home. The results from
the questionnaires indicated overwhelming support from family members and support workers for the use of drama therapy for young adults with ASD. Overall, five themes emerged from the data collected. Family members and support workers indicated that the program was supportive in the following areas (1) Feelings: participants were provided a safe place to explore, (2) Peers: participants felt included and made friends, (3) Social skills: participants learned and practiced through role-play, (4) Structure: the predictability of sessions lessened anxiety, (5) Families: participants and their families felt supported. There were no negative comments. However, the study had many limitations. First of all, within therapy sessions, there were many variables that remained inconsistent across clients, for instance, whether the sessions were group or individually-based, or who the drama therapist was. The data collected were furthermore self-reported, which could lead to bias or a perceived obligation to rate the program as excellent. Another limitation was insufficient description of participant factors. There was no indication of variability in participants, how old these children were, their level of severity or how long they attended the program, limiting the ability to make generalizations. Lastly, the study indicated a lack of follow-up interviews to clarify some of the feedback that was given. Such feedback would have been beneficial if there was anything that was unclear or the researcher wanted the parent or support worker to elaborate.

1.4.2 Quantitative Studies of Drama Research

A similar study examined the effectiveness of an expressive arts group therapy program, “SuperKids”, on the social skills of individuals 11 to 18 years of age (Epp, 2008). There were 66 primary and secondary school students with ASD who participated, including those with the diagnosis of Asperger’s, high-functioning autism and pervasive developmental disorder – not otherwise specified (PDD-NOS). The researchers believed that behaviour and cognitive training
through art therapy could assist in enhancing communicative functions. Expressive art therapy in this case was expressed in many forms, including music, drama and visual arts. Group therapy was chosen as the most effective way because individual therapy offered limited opportunities to development of social skills (Epp, 2008). Groups averaged six participants in size, all participants being similar in age and communication profile. The groups met weekly during the school year for an hour and were led by somebody with a master’s degree either in drama therapy, art therapy, school counselling or special education. The goals of the sessions were to develop the following: compromise, politeness, conversation, eye contact, voice modulation, friendship, non-verbal cues, awareness of environment, identification and expression of feelings in themselves and others. Leaders of the program intervened when needed in order to provide structure or help in a situation. Questionnaires were administered to parents and teachers. Each questionnaire had two sections. The first asked questions regarding social skills, which measured positive interactions like cooperativeness, assertion, self-control and responsibility. The second asked questions regarding interactional difficulties, which measured behaviors like aggression, temper control, hyperactivity, sadness and anxiety. The results of this study showed that post-program, students with ASD exhibited an increase in some social skills, assertion, and a decrease in some problem behaviours, internalizing and hyperactivity. Social skill behaviours of cooperation, responsibility, self-control saw no significant effect. No significant effect was also found for externalizing problem behaviours. Implications of this study are that social skills can be taught through artistic group means, giving individuals with ASD the ability to develop and rehearse social skills that they can assimilate into their behavior outside of the therapy setting. The arts therapy is also very flexible because it can work on a range of social skills from non-verbal movement to role playing, working on storytelling to problem solving (Epp, 2008).
However, some limitations should be noted. For instance, this study was based on a single program in a community; therefore, generalization is limited. This study was also based on questionnaires, again a possible risk for bias. There was no control group and therefore any progress due to extraneous factors cannot be ruled out. Qualitative studies containing a control group have also looked at drama therapy as a tool for social communication as discussed below.

Lerner et al. (2011) conducted a pilot study to investigate the effectiveness of Socio-Dramatic Affective-Relational Intervention (SDARI), an intervention proposed to improve social skills among adolescents with high-functioning autism. This intervention had three core components: (1) a performance-based social skill curriculum, with adapted improvisational games and dramatic training; (2) a focus on building relationships to strengthen social interaction; and (3) age-appropriate activities. The SDARI program took place for five hours a day over 6 weeks, for a total of 145 hours of group therapy in 29 sessions. Seventeen youth with an Asperger’s or high functioning autism diagnosis between the ages of 11 and 17 years participated. Nine youth were assigned to the treatment group while eight were assigned to the comparison group. In order to measure a potential difference in social skills after participating in the SDARI program, researchers utilized a variety of measures. Typical social behaviour was measured through parental report on the Child Behaviour Checklist (CBC; Achenbach, 1991) and Social Skills Rating System (SSRS; Gresham & Elliot, 1990). Autism-related behaviours were also parentally reported via the Emory Dyssemia Index (EDI; Love, Nowicki & Duke, 1994) and Social Responsiveness Scale (SRS; Constantino & Gruber, 2005). In order to measure the ability to read nonverbal emotional cues on faces and paralinguistic characteristics, the Diagnostic Analysis of Nonverbal Accuracy 2 (DANVA-2; Nowicki, 2004) was administered. Lastly, in order to capture mental health wellness, youth were asked to complete the Beck
Depression Inventory – Youth (BDI-Y; Beck, Beck & Jolly, 2001). All tools, with the exception of the CBC, administered every other visit, were administered every three weeks over an 18-week period, with the SDARI intervention taking place during the middle 6 weeks. The researchers predicted that SDARI participants would: (1) improve on parent-reported social functioning measures at the end of the treatment program; (2) display a decrease in errors in non-verbal cue reading and self-reported depression symptoms; and (3) maintain gains post-treatment. In terms of social functioning, no differential trend was reported for SDARI participants other than a significant positive effect for social assertiveness. In terms of reading non-verbal cues, the SDARI group showed improvement on the detection of emotions in adult voices but not in faces when compared with the control group. In addition, no effect was found for self-reported depression symptoms. In terms of maintenance of skills, when re-assessed 6 weeks post-treatment, the SDARI group showed continued improvement in social assertion and ability to detect emotion in adult voices compared with the control group. Thus, this study demonstrated that some aspects of social communication improved after the SDARI intervention; however, others were unchanged. A strength of this study was that it contained a relatively large sample size when compared with similar studies. In addition, it utilized a control group that was matched for relevant participant variables and was one of the first to find generalization for drama-based therapies. However, this study too had some limitations. Firstly, participants were not randomly assigned to the treatment or control group and participants included within the control group had participated in the program before, which could explain why there were no significant group differences seen on particular measures. In addition, many of the tools they utilized were qualitative, i.e. parent-reported or participant-reported and therefore subjective and administered over a relatively short period of time.
Another more recent study by Guli et al., (2013) explored the effects of participation in a Social Competence Intervention Program (SCIP), a 16-session intervention program developed from creative drama activities. Youth aged 8 to 14 years, with social difficulties, including those with ASD, nonverbal learning disability (NLD) and ADHD participated. Participants were pseudo-randomly assigned to the intervention (n=18) or control group (n=16). In order to measure the effects of the SCIP, two parent report measures of social behaviour were given, the SSRS (Gresham & Elliot, 1990) and the Behavioural Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). In addition, the DANVA-2 (Nowicki, 2004) was also administered to assess social competence of facial expression and prosody. For 17 of the participants (38% of the treatment group, 50% of the control group), 20-minute observations of social interactions were also conducted either at home or at school. These measures were used pre-treatment and post-treatment. Observations were then coded into three categories: positive social interactions, solitary behaviour and neutral behaviour. Guli et al. (2013) predicted that SCIP participants would: (1) improve on their social functioning, as reported by parent-report on the BASC; (2) overall display fewer errors on nonverbal cue reading as measured by the DANVA-2; (3) improve on observed social interaction outside of the program, showing a generalization of skills. Furthermore, these improvements would be indicated by the participants and their parents during interviews post-program. Significant effects were not found for the SSRS, BASC or DANVA-2 measures. However, a moderate effect was observed for the intervention participants during the 20-minute observations. There was an increase in positive interactions and decrease in solitary play. This indicated an improvement in social interaction when participants were observed in a naturalistic setting. Afterwards, interviews were conducted with participants and their caregivers, who were asked if they observed any improvements. Over
75% of parents reported one or more positive changes with their child’s interpersonal relations, a better understanding of nonverbal cues and increased empathy and self-control. Similarly, over 82% of the participants who took part in the program reported one or more positive effects including that they could read social cues better, got along better with others and found it easier to make friends. Although this study did not show improvement on all measures utilized, this study displayed promising results of being useful for individuals with various diagnoses. However, a limitation of this study was that even though the treatment and control group participants were matched for age, gender and cognitive ability, children in the treatment group were prescribed medication and displayed greater deficits at baseline when compared with the control group. This is a potential limitation of the data as it is difficult to know if the changes were due to the SCIP program, severity or medication. In addition, the 20-minute observations were completed by one of three observational coders; however, none were not blind to the diagnosis of participants and reliability of coding was not determined. Furthermore, parent report measures relied on subjective ratings and were therefore subject to bias.

1.5 Motivation for the Current Study

To date, there is a small but growing body of research evidence suggesting that drama therapy can have benefits for children and adolescences with social-pragmatic difficulties. The above-mentioned studies suggest that drama can enhance the social communication skills of individuals with social-pragmatic needs. However, there are a number of issues in those that used standardized measures such as the SSRS, BASC, DANVA-2, because they were not sensitive enough to capture small gains, especially in such a short period of time. In addition, the limited number of studies available primarily used parent-report questionnaires, which are subjective and therefore vulnerable to response bias. Furthermore, a main drawback to these studies is that there
is no agreement concerning the definition of “social skills” (Rao et al. 2008). The question remains as to how to operationalize or assess such skills.

1.6 New Directions

The current study was designed to address some of the methodological issues in studies of drama therapy as used to enhance social communication skills. The present study used a number of both quantitative and qualitative outcome measures and a broader population in terms of social communication deficits.

Because social behaviours are usually observable, methods that include direct observation of social interactions are perhaps more sensitive for capturing social abilities than standardized measures. For the present study, one major measure was adopted in addition to measures that have been used previously: Goal Attainment Scaling (GAS), first developed by Kirusek and Sherman (1968). This criterion-referenced procedure quantifies observable behaviours over intervention periods. After goal areas are identified, goals are rated on a 5-point scale with a minimum of -2 and maximum of +2, where -1 is considered baseline performance (Turner-Stokes, 2009). An expected outcome for each goal is then defined which is the most probable result of treatment, given a value of 0 (Turner-Stokes, 2009). In addition, descriptors are developed for each achievement level. The client’s progress is then re-evaluated at a pre-determined time. The 5-point ordinal scale is as follows:

+2 Best anticipated treatment success  
+1 More than expected success with treatment  
0 Expected level of treatment success  
-1 Less than expected success with treatment  
-2 Most unfavorable treatment outcome thought likely

Kiresuk and Sherman (1968, p. 446)

GAS measures the degree of progress from baseline, as meeting or exceeding expectations, or if there is decline, rather than classifying a goal as achieved or not. Progress of a
goal is measured by requiring less support, shorter time period or higher frequency of target behaviours, whereas regression is determined by the need of more support, longer duration or lesser frequency of target behaviours. Many disciplines within the rehabilitative sciences such as occupational therapy, physical therapy and mental health have utilized this method for measuring client progress (Schlosser, 2004). GAS has many positive attributes, for example, the ability to compare across goals and clients through aggregation, the individual nature of goals and the possibility to set goals in various domains. In addition, GAS has also been shown to be sensitive to fine changes in behaviour and avoids floor and ceiling effects in comparison with standardized tests (Schlosser, 2004). In terms of reliability of rating goals, rehabilitation studies have indicated excellent inter-rater agreements of 0.88 and higher (Schlosser, 2004; Malec 1999).

GAS does have some potential issues and limitations. GAS still relies on subjective rating of goal areas and behavioural characteristics that may not be equidistant (i.e., the distance from 0 to +1 may be different qualitatively from the distance from 0 to -1 for a given goal or across goals). In terms of content, construct and criterion validity, the literature has yielded mixed results and thus, validity must be assessed on a case-by-case basis (Schlosser, 2004). Common mistakes with GAS involve scaling, i.e. creating steps (+1, -2 etc.) that are not equivalent within a goal, or across goals; there may be overlaps between assigned levels, or goals that are too easily achieved. In order to avoid this, it is recommended each assigned level differ in only one dimension (Schlosser, 2004), i.e. frequency of a targeted skill or level and amount of prompting or observation context. Goals should be written as clearly and specific as possible. In clinical settings, it is recommended that GAS is set by the individuals themselves. However, in some client populations, this cannot be done and assumptions are then made regarding their goal areas. Goals are individualistic and can also be weighted differently, based on their difficulty or
importance. However, as noted, goal areas or levels may not be equivalent across individuals who do not share the same goal areas. Nevertheless, Schlosser (2004) indicates that GAS has been shown to be a unique technique for measuring progress in communication disorders; such a method may be useful for measuring skills that are difficult then to assess, such as social-pragmatic communication.

Many studies have exclusively studied social-pragmatic interventions with children with ASD (Rao et al., 2008; Epp, 2008; Lerner et al., 2011; Godfrey & Haythorne, 2013; Corbett et al., 2015), even though children without that diagnosis can have social-pragmatic deficits as well (Guli et al., 2013; Happe & Frith, 2014). The current study thus expands the database of studies in drama therapy, including children with social-pragmatic deficits or ASD. The methodological adaptations led to the questions below.

### 1.7 Research Questions

The following broad research questions were addressed in the study: (1) Do children with social-pragmatic difficulties, after participating in a 10-week drama-based intervention, InterAct, show improved social communication skills?; and (2) Most importantly, what methodology or methodologies best capture changes in social behaviour and cognition?

Predictions relative to the first question were: (1) InterAct participants would show an improvement post-treatment in relation to measures of emotional recognition, embodiment and flexible thinking and inferencing, as compared with baseline performance; and (2) InterAct participants would show an improvement in their individual goals as measured by GAS post-treatment as compared with baseline performance. Relative to the second question, GAS was expected to be a useful way to document specific changes in participants' social communication because of its focus on an individual's behaviours.
Chapter 2: Methodology

Chapter 2 begins with a brief description of participants, then discusses the procedures and measures used in assessment. A description of the intervention structure and content is then provided. The chapter concludes an in-depth description of participants after initial assessments tools are described, and outlines the individual goals for treatment (GAS scaling).

2.1 Participants

Participants were recruited through advertisement flyers distributed at a local support centers for children with developmental disabilities or by referral to the SLP who facilitated the program. Written informed consent was obtained from parents and assent was obtained from child participants. Inclusion criteria were: (a) between the ages of 6 and 9 years; (b) with reported social pragmatic difficulties; and (c) proficient in English. Participants were excluded if they were (a) unable to commit to a 10-week intervention; (b) unable to attend without the assistance of a personal support worker; or (c) receiving speech-language therapy currently. The first seven children meeting all inclusion criteria were selected for the study. One participant did not attend the group after session three for unknown reasons, and thus, the final sample included six children (four boys, two girls) between the ages of 6 and 9 years (mean age = 7;8). All participants’ first language was English; only one participant had a second language in addition. Participants had a variety of known diagnoses: ASD, Complex Developmental Behavioural Condition, selective mutism, anxiety or global delays with associated social-pragmatic difficulties. (See the final section in this Section 2.6.)

2.2 General Design

The current study was a preliminary investigation utilizing a general case study design replicated over six participants. This design was seen as suitable for two reasons. Firstly, it was
the first formal step in testing the effectiveness of the InterAct program. Secondly, all participants had different levels of communication proficiency and skills.

2.3 General Testing Procedures

First, parents were asked to complete a standardized measure of their child’s social functioning in an attempt to screen participants as appropriate candidates for the program and obtain a picture of their social functioning profiles. Participants were then assessed at five different time points: (1) at baseline (Time 1); (2) 10 weeks later, at the start of the program (Time 2); (3) in the first three weeks of the program in order to determine baseline for GAS goals; (4) during the last two sessions of the program to test outcomes of GAS goals; (5) post-program (reported as Time 3 in Results). Due to scheduling, participants were either assessed immediately or 1 week post-program. The intervention itself took place over 10 weekly sessions; however, participants were evaluated during the first three sessions to determine GAS goal areas which were then re-evaluated during sessions 9 and 10. Table 1 contains a summary of the tasks completed across the time period. Please see Appendix A for an expanded summary of the constructs, procedures and analyzed variables. Each assessment session required the participant to sit for one hour with the exception of the assessment at week 10, which took approximately 30 minutes. The intervention and assessments were all conducted at the clinic of the SLP conducting the program. All assessments were completed by the primary investigator.
Table 1 Data Points Across Assessments Period

<table>
<thead>
<tr>
<th>Week(s)</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Intervention</th>
<th>Time 3</th>
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<tbody>
<tr>
<td></td>
<td>Week 1</td>
<td>Week 10</td>
<td>Weeks 10-13</td>
<td>Weeks 20-22</td>
</tr>
<tr>
<td>Procedure</td>
<td>CCC-2</td>
<td>Conversation and narrative samples</td>
<td>Determination of GAS goal areas</td>
<td>Conversation and narrative samples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inferencing task</td>
<td></td>
<td>Facial processing task</td>
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<td>Facial processing task</td>
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<td>False-belief task</td>
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<tr>
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<td>False-belief task</td>
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<td>SLDT-E Subtest</td>
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<td></td>
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<td>A and Subtest C</td>
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<tr>
<td></td>
<td></td>
<td>Parent questionnaire</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Participant questionnaire</td>
<td></td>
<td>Participant questionnaire</td>
</tr>
</tbody>
</table>

Note. CCC-2 Children’s Communication Checklist 2; SLDT-E Social Language Development Test-Elementary

2.4 Areas of Evaluation

The following section discusses the quantitative and qualitative measures used in this study based on the area that was measured. All assessment tasks generated quantitative data with the exception of the participant descriptions, which were qualitative. Additionally, the parent questionnaire and participant interviews utilized both quantitative and qualitative measures. The general areas evaluated were in general social functioning, general language abilities, social cognition and social behaviour.

2.4.1 General Social Functioning

In order to assess general social functioning, parents of the participants were asked to complete the Children’s Communication Checklist (CCC-2; Bishop, 2006) at the beginning of the study only. This tool can be used to identify children with pragmatic impairment or possible speech and language impairment (Bishop, 2006). The current study obtained parent-reported information about the participant’s communication, in regards to their perceived severity and communication strengths and needs in everyday settings. The CCC-2 presents 50 statements and asks the parent to rate the frequency of that observed communicative behaviour, from less than
once a week (or never), at least once a week, once or twice daily, or several times (more than twice) a day (or always). The statements cover a variety of domains: speech (articulation), syntax (sentence structure), semantics (expressive vocabulary), coherence (configuration of concepts), initiation (talking to others without encouragement), scripted language (repeating phrases), context (communicating differently depending on the situation), nonverbal communication (e.g. facial expression, body proximity, eye contact etc.), social relations (forming relationships others) and interests (e.g. restrictive, unusual and/or repetitive). From reports on these domains, one can obtain a communicative profile of the participants in this study. The variables of interest in this study were domain areas of strength and weakness for each participant, the general communication composite (GCC) and the social interaction difference index (SIDI) score. The GCC generated normed-referenced scores by summing the subtest scaled scores. A standard score between 85 and 115 is considered within the normal range. SIDI scores ranging from -10 to 10 are typical, scores 11 or greater are typical of children with Specific Language Impairment (SLI), whereas scores -11 and greater are typical of those with ASD. Three out of six participants had a standard score within the normal range, indicating that their general communication performance was similar to other children of the same age, while the remaining three participants had a standard score below the normal range. Four out of six participants presented with a SIDI score within the normal range, whereas two out of six participants had a SIDI score lower than -11, typical of children with ASD. However, the authors of this test indicate that even though a child presents within the typical range does not mean that they do not exhibit a communication impairment. Instead, scores are indicative of ASD or language impairment, where these children may present with an even profile in those two domains. Table 2 presents the general results of
the CCC-2, including the GCC and SIDI for all participants. Domains that were areas of strength and need for participants are presented later in this chapter, in their individual sections.

Table 2 Children’s Communication Checklist-2 Results

<table>
<thead>
<tr>
<th>Participant</th>
<th>General Communication Composite</th>
<th>Social Interaction Different</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Score</td>
<td>Percentile Rank</td>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>59</td>
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</tr>
<tr>
<td>6</td>
<td>88</td>
<td>21</td>
</tr>
</tbody>
</table>

2.4.2 General Language Abilities

Language samples were video-recorded and taken at three time points in order to describe the general language profile of participants. For the 5- to 10-minute conversational sample, the children participated in a ‘share and tell’ activity. They were asked to bring in an item of their choice, such as a toy, book or drawing to share with the primary investigator, who also brought in an item to share with the participants in order to help facilitate conversation and build rapport.

A narrative retell sample was also collected. Participants viewed short animated videos. All videos contained music but no speaking or language. Thus, participants had to rely on reading nonverbal cues in order to understand the feelings and communicative intent of the characters. At the beginning of baseline (Time 1) and post-program (Time 3) participants were shown *Mariza the Stubborn Donkey* (4:25 minutes; Krystallis, 2009). The video opens up to a Greek island. It zooms in and we see a man and his donkey. The man is traveling with baskets of fish for the donkey to carry. When the donkey realizes that they have to walk to the top of the mountain on this island, he becomes stubborn and refuses to go any further. The man begins to beg him to go. The donkey continues to refuse and the man gets so angry he yells and slaps the donkey on the behind to make him go. However, that does not work and the donkey lays down.
The man walks away. He then gets an idea, walks up to the donkey with a radio and presses play. Music starts to play. It starts off slow, and begins to get faster and faster, eventually making the donkey leap up and dance, all the way up the mountain. Once the song is over, the two share an embrace and realize they have made it to the very top. However, the man goes to grab his baskets of fish and is surprised that they are empty. Their dancing caused all the fish to fall out and fish are shown scattered all over the road. The man is sad. The donkey grabs the radio again with his mouth and looks at the man with raised eyebrows; the man smiles and presses play.

In order to decrease the risk of practice effects, participants viewed a different video at Time 2, *Take Me Home* (4:10 minutes; Archawattana, 2013). This video opens up to a dog kennel. A lonely sad mutt is shown. Suddenly, a young girl walks in and he gets very excited when he sees her, jumping up and down. She seems happy to see him but then shifts her attention to another dog, a poodle. She gets even more excited and goes over to see the poodle. The mutt, jealous of the poodle, grabs cotton from his bedding and puts it on his fur to look more like a poodle. The girl comes over to see him but then laughs; he again becomes sad. She goes back to see the poodle and tries to put a collar on her. The poodle however, snaps at her angrily, causing her to become frightened and drop the collar. When she does, the mutt sticks his head out of his cage and gets stuck. She picks up the collar and helps get his head out of the bars. She smiles and realizes that she would rather take him home. She then opens up the cage and puts the collar on him. The mutt becomes very excited.

While the video was playing, the primary investigator left the room and re-entered at the end of the video. Participants were then given seven photographs, stills from the video at different time points. Participants were asked to sequence the photographs in order and retell the story to the primary investigator who missed the video. The participants were not evaluated on
how well they sequenced the photographs, because they were just used as a visual guide to reduce the cognitive memory load.

Language samples were then transcribed by the primary investigator and analyzed using the Systematic Analysis of Language Transcripts (SALT; Miller, Igesias, & Nockerts, 2012) software. To ensure reliability of transcription, 10% of the samples were examined by a second graduate student in speech-language pathology, who reviewed the transcripts while watching the video samples; any discrepancies in the transcript were noted. Average inter-rater reliability for the word-level transcription across children was 97.34%, range 95.28-99.16%. Types of discrepancies noted were minor, for instance, spelling errors, omissions or additions of words or pauses.

2.4.3 Social Behaviour and Cognition Measures

In order to assess areas of social behaviour and cognition, several methods were utilized. Measures are divided below into those completed outside of the treatment sessions (distal measures) and those completed within treatment sessions (proximal measures).

2.4.3.1 Distal Measures

Measures described below were completed outside of the session. Distal measures include the Social Language Development Test – Elementary, False-Belief Task, Inferencing Task: Finish the Story and Facial Processing Task.

2.4.3.1.1 Social Language Development Test – Elementary

In order to assess social cognition, the following procedures and tasks were used. Subtests of the Social Language Development Test - Elementary (SLDT-E; Bowers, Huisingh & LoGiudice, 2008) were administered pre- and post-treatment. Subtest A: Making Inferences, asks participants to pretend that they are a person in a photo. The participant must take the person’s
perspective and make inferences about what they must be thinking and why. For example, “Pretend you are this baby (image shows a baby crying in a crib). What are you thinking?” In order for statements to be correct, participants must make specific statements relating to context and nonverbal cues in the picture. In addition, when they are asked to take the perspective of the person in the photo, they must speak in the first person. Participants are then asked, “What do you see that tells you what he’s thinking?” Correct responses are those in which the participant references visual cues and is able to interpret their meaning. Subtest C: Multiple Interpretations, requires the participant to be flexible with their thinking and give two possible interpretations of the same photograph. For example, “This boy is holding his head in his hands. Tell me two different things he might be thinking.” The participant must give two different logical and relevant interpretations.

2.4.3.1.2 False-Belief Task

“Theory of Mind” was tested by using the Sally-Anne false belief task (Baron-Cohen, Leslie & Frith, 1985) which was administered pre-treatment and post-treatment, Time 1 and Time 3. During this task, participants were told a story using two puppets, labeled Sally and Anne. The participants were told that Sally has a basket and Anne has a box. Puppet Sally put a marble inside her basket. She then left and went outside, where she could no longer see her basket. While Sally was away, Anne took the marble from Sally’s basket and put it in her box. Sally then came back inside. At this point, participants were asked a series of questions. To make sure the child understood the basic components of the story and was paying attention during the task, all participants were asked the following questions: (1) Which one is Sally? (2) Which one is Anne? (3) Where is the marble now? (4) Where was the marble in the beginning? Finally, the theory of mind question is asked: (5) Where will Sally look for her marble? Participants were
deemed to pass the test if they answered that Sally would look for her marble in her own basket. This shows that the participant recognizes Sally’s perspective. If a participant passed the theory of mind task pre-treatment it was not repeated post-treatment because it was assumed that “theory of mind” for a false-belief task was present.

2.4.3.1.3 Inferencing Task: Finish the Story

Lastly, informal evaluation of social cognition and processing were derived from the narrative retell task. After the participant’s narrative retell, they were presented with a card with a question mark and asked to finish the story based on what they had seen in the video in order to see if participant’s could infer the behaviour of an agent of the story based on what they understood. The primary investigator and a second graduate student in speech-language pathology brainstormed suitable endings beforehand and by consensus, deemed the responses acceptable if they were logical and the child made reference to previous events in the story based on the character’s actions. For example, in Mariza the Stubborn Donkey (shown at Time 1 and Time 3) the most suitable answer for an ending would be making reference to going to get more fish or deciding to forget about it and turn on the music to dance. Versions of those answers were deemed acceptable responses. For Take Me Home, the most suitable answer would be that the little girl adopts the dog at the end. Examples of unacceptable responses were vague answers (e.g. “He is happy at the end.”) or mentioning something that did not take place in the story (e.g. “They go back on the boat”).

2.4.3.1.4 Analysis of Reaction in Narratives

Lastly, the narrative language samples were analyzed for reaction, that is, instances of any reference to how the characters felt or thought or how they reacted physically, which was the only story grammar element of interest because it was targeted in the intervention. The primary
investigator and a second graduate student independently counted the number of instances of reference in the narrative samples. Any counts that were in disagreement were then reviewed until consensus was reached.

2.4.3.1.5 Facial Processing Task: Emotion Recognition and Embodiment

A facial processing task was completed by asking participants to look at the photographs from the video and asking, “How do you think they feel?” to see if they could correctly identify the emotion. The emotions expected were happy, angry, sad and surprised, with the addition of scared, a relevant emotion for the video shown at Time 2. Synonyms for emotion labels were also counted as correct, for instance, if a child said cheerful for happy, upset for angry, unhappy for sad, frightened for scared or shocked for surprised.

After they labeled the emotion, the investigator asked the participants to pretend that they were the character and then show how they might feel with their body, to see if participants could successfully embody the emotion. Participants were scored on a points system in order to capture the level of embodiment. One point was awarded if they showed the emotion in their eyes, mouth, body or vocally (sound effect). The maximum amount of points a participant could receive for embodying each emotion was 4, and the minimum 0, whereby they did not embody the emotion correctly or at all. For instance, if a child frowned for the emotion 'sad', he or she was awarded 1 point. If in addition to frowning, the child also frowned with their eyes, slouched in sadness or made crying noises, they received 4 points. For the purpose of this study, because emotions were elicited and not observed in a naturalistic setting, emotional embodiment was included as part of social cognition.

2.4.3.1.6 Participant and Parental Feedback

Post-program all parents were sent a questionnaire in the mail and asked their thoughts
and feelings about the program through written responses and using a 1 to 7 Likert Scale. The questionnaire took approximately 15 minutes to complete. To make the questionnaires anonymous, parents were not asked any identifying information. See Appendix H.

During the final assessment session, participants provided feedback about the program in a 5-minute interview and then rated their level of satisfaction on a visual 5-point visual Likert scale (Lentz, 2009). See Appendix I.

2.4.3.2 Proximal Measures

Described below is Goal Attainment Scaling, a measure employed to measure social behaviour and cognition within the program.

2.4.3.2.1 Goal Attainment Scaling

Finally, GAS goals were completed for each participant to capture their social interaction within the group setting. Each participant’s GAS profile was based on video-recordings of their performance during Sessions 1 to 3. Individualized goal areas were determined based on areas of need and varied depending on the participant’s skill level. All goals were weighted the same rank. By Session 4, each participant had two goals which were determined by the primary investigator in consultation with the program facilitators and thesis supervisors. Goal setting was delayed due to the need to observe participants over a few sessions in order to predict a realistic outcome response to treatment. Goals were reviewed at the appointed review date, which was based on video-recordings of their performance during Sessions 9 and Sessions 10. Appendices B to G display the GAS goals for each participant. In order to assure inter-rater reliability of GAS scorings, the ratings of the primary investigator were then compared with those of a second GAS rater. Any goals that resulted in disagreement between the two raters were then reviewed by a third GAS rater to determine their final score. The composite goal scores, which are the
sums of attainment levels multiplied by the weight of the goals (which were 1 across all goals), were then transferred into a normally distributed T-score for future potential examination, using an electronic calculation sheet in Microsoft Excel which automatically calculates the baseline, achieved score and change score (Turner-Stokes, 2009).

2.5 The Intervention

InterAct is a group therapy approach by an SLP and Professional Instructor in Applied Theatre. The program was developed to help young people with social-pragmatic difficulties develop the basic skills of social interaction by using drama-based games and semi-structured activities. Foundational communication skills are targeted, which culminate in a show or a short film that highlights the participant’s strengths and the skills they have acquired. The program is designed to help children and adolescents with varies aspects of social situations in the hope of increasing their confidence with social interactions with others in their peer group. The overarching goals of the InterAct program were to develop: (1) social behaviour and interaction; (2) socio-emotional awareness of themselves and others, which includes the ability to modulate their own communication as a result; and (3) gain confidence in their communication abilities.

For the study, the program was fully subsidized and offered for free to participants. InterAct was delivered over 10 weekly 1-hour sessions, with the exception of the first and last session which were 1.5 hours. The primary investigator observed all sessions in order to document program content and participant progress. The primary investigator also noted engagement in activities, that is, whether they participated enthusiastically (showed excitement, willingness to participate), reluctantly (needed verbal encouragement, moaned, looked annoyed or disengaged), chose not to participate (removes himself or herself from activity), or were absent. All sessions were video-recorded using a PowerShot ELPH 100 HS Canon digital camera.
2.5.1 Program Structure and Final Performance

Each session had a theme inspired by social interaction and theatre-based instruction such as recognition and embodying emotions and feelings, perspective-taking, exploring body language, narratives and characterization. Every session started with general conversation with participants sitting in a circle. Facilitators selected games and activities that they deemed fit for the theme of that particular session, which are described in the section below. At the end of the sessions, 5 to 10 minutes were dedicated to discussion and wrap up, where participants were asked to share with the group what they liked and did not like about the session. At week 6, participants were put into pairs based on their strengths and weaknesses. These pairs would be partners for their final performance which involved creating, filming and showing 30 second commercials. During the sixth session, activities were played while pairs were pulled-out of the session to write their commercial with one of a facilitator’s assistance. Commercials were deemed most appropriate by the facilitators for this young age group as a culminating activity because commercials are familiar and a short duration. The facilitators wanted to create a context for participants to practice delivery of scripted lines with an end goal in mind. The scripts required interaction between participants in mock restaurant commercials where participants sold their favorite food. They were on average five lines in length. Each participant had at least two lines, with the last line of the commercial always said in unison. Commercials were a collaborative effort as participants were equal contributors in what they had created. Parents were sent an email by the facilitators with the child's attached script and were asked to help the child practice and memorize the script before the next session. In the following sessions, 5 to 10 minutes of the sessions were dedicated to practicing introducing themselves and presenting their commercials to the group. The scripts gave participants an opportunity to experience what
smooth communication feels like, while minimizing cognitive load on working memory and processing. Communication in this context could be rehearsed and refined. During the ninth session, commercials were filmed, and then showed during the final session. Parents were invited to come watch. Participants had to get up, say their name and age and in unison present, “this is our commercial” which was then played. Below is an example of a commercial script:

    Participant 6: I love chicken burgers!
    Participant 3: And I love French fries!
    Participant 6: For only 99 cents…
    Participant 3: For a limited time only!
    Together: We love X Restaurant!

2.5.2 Activity Content

Over the course of the program, 52 different activities and/or games were played, with a total of 9.93 treatment hours. For every activity within the session, every child had at least one opportunity to participate. Types of activities included icebreakers (e.g. “getting to know you” games), imaginative play (e.g. pretending an object is something else), role-playing (e.g. assuming a character), physical movement games (e.g. stop-go or freeze tag), scripting activities (e.g. practicing lines), problem solving (e.g. scavenger hunt), listening to stories and fairy tales (e.g. reading a story) and reflection and discussion (e.g. session wrap up or discussing feedback). The most frequent types of games played were physical movement games (27%) followed by role-playing (19%) and problem solving (17%). The least amount of time was spent on ice-breakers (3%) and listening to stories (4%). See Appendix J for a full summary of type of activities and percentage of time played. Each game or activity had different objectives or goals that were coded. An example is provided in Figure 1. For example, a well-known game like “Simon Says” addressed skills like flexible thinking, listening and following directions, and body language/movement while a game like “Line Up”, requires participants to line up according to a
specific trait (e.g. height or age) and addressed skills such as sequencing, listening and following directions and problem-solving. In total there were 11 goals/objectives of activities coded for: (1) team building; (2) flexible thinking; (3) listening and following directions; (4) emotional awareness; (5) problem solving; (6) perspective-taking; (7) body language and movement; (8) creativity/generating own ideas; (9) clear and loud articulation; (10) eye contact; and (11) sequencing.

Figure 1 InterAct Sample Goals Versus Games Table

<table>
<thead>
<tr>
<th>Games</th>
<th>Flexible Thinking</th>
<th>Problem Solving</th>
<th>Body Language and Movement</th>
<th>Sequencing</th>
<th>Listening and Following Directions</th>
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</thead>
<tbody>
<tr>
<td>&quot;Simon Says&quot;</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>&quot;Line Up&quot;</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 displays the amount of time allocated to activities working on the mentioned goals/objectives above. It is important to note that there was never one goal or objective for a single activity; several goals and objectives were simultaneously targeted within one single activity. The objectives most commonly addressed were listening and following directions, body language and movement and articulation. The least worked on objectives were trust-building, problem-solving and eye contact.
Figure 2 Time Spent on Activity Objectives and Goals

**Time Spent on Activity Objectives and Goals**

- Sequencing
- Eye Contact
- Clear and Loud Articulation
- Creativity/Generating Own Ideas
- Body Language and Movement
- Perspective Taking
- Problem Solving
- Emotional Awareness
- Listening and Following Directions
- Flexible Thinking
- Team Building

![Bar Chart](chart.png)

2.6 **Detailed Participant Profiles and Goals**

Participants are described in more detail below based on the three assessment measures:

1. parent report as indicated by the CCC-2; 
2. initial conversational language sample; and 
3. session behaviours during the first three sessions which were used to determine GAS goal areas.

Each subsection ends with the participant’s GAS goals. The goals chosen were two areas of need identified as priority that could be targeted within the time of treatment. Please see Appendices B to G for description of participant GAS levels. Baseline performance was rated as -1. Progress and regression was based on the frequency of target behaviour, amount of supported needed or type of support needed.
2.6.1 Participant 1

The parent report measure, CCC-2 administered pre-treatment, indicated a communication profile similar to those with ASD for Participant 1. Areas of relative strength were articulation, syntax and expressive vocabulary. Areas of need were in initiation, social relations and interests.

Participant 1 walked into the assessment room and sat down in the empty chair. Upon initially meeting the primary investigator, he answered in short utterances, one to three words. The majority of their conversation was very transactional, with the primary investigator asking questions and him answering. “Did you learn how to play chess at school?” she asked. “No.”, he responded. There was a pause. “So where did you learn how to play it?”, she asked. He is observed to pose one spontaneous question back at the primary investigator, “Do you play chess?” and leans into the conversation, looking intently at what she is saying as they progress.

During the first treatment session, participants were asked to introduce themselves to the group. Participant 1 took in a deep breath and listed his name, age, and favourite food in a very rigid manner as fast as possible, while gently rocking back and forth. When a new activity or game was introduced that required some level of flexible thinking, he appeared willing to engage but was uneasy at first and often sought clarification multiple times before participating. For example, during “Environments”, participants were asked to physically embody what it would be like to walk through different worlds such as marshmallow world. Facilitators posed questions to the group, “What would it feel like?” and he was always the first to answer, e.g. “Sticky!” The facilitator then directed the participants to walk around the room like they were in that world. Before doing so, he asked, “We just walk around here?” They began to play another game of “Stop Light” where they had to walk normally if someone called green, slowly if they called
yellow and stop if it was red. He raised his hand and asked, “But can we breathe?” Participant 1 was always enthusiastic to participate; however, when a new activity was introduced, he would seek clarification at least twice during the session before jumping in, which displayed that he had some anxiety or reservations. Later during the session, one of the participants shared that their birthday was on Sunday. He then asked the facilitator, “This Sunday or next?” in which the facilitator replied, “Why don’t you ask him?” Participant 1 decided not to ask him and the session moved on. He was observed to never direct his statements or questions towards his peers at the beginning of the program, but only to the facilitators, even if they were directly about the other participants. General goal areas for Participant 1 were thus to increase: (1) his ability to spontaneously jump into new activities that require flexible thinking; and (2) social interaction with peers.

2.6.2 Participant 2

According to the initial parent report, Participant 2 had a mild-moderate communication impairment. Participant 2 was below average in all communication domains on the CCC-2 when compared with other children his age. However, areas of general strength were initiation of conversation and expressive vocabulary. Areas of greatest need were in nonverbal communication, articulation, syntax, coherence, scripted language, context and interests.

Participant 2 met the primary investigator, who showed him the schedule for the day. He referred to it throughout the session, relying on it to remind him of what they were doing and what they were going to do. He was very eager to share a book he brought to share, standing up and flapping his arms in excitement. When the primary investigator asked him to tell her about the book, he opened it up and began to read it verbatim from start to finish. Occasionally the primary investigator would ask him a question about a certain page and he was happy to stop to
answer her. He was observed to ask several questions back to the primary investigator; the conversation seemed very balanced.

During the initial three sessions, Participant 2 was assigned roles that he did not want to play. He refused to participate, forcing the facilitators to assign him another role. Participant 2 asked to go to the washroom and upon coming back, realized that he missed an activity. He asked if they could play it again and the facilitators explained that they had to move on. He sat in his chair and became disengaged, looked away from the activity and put his hands over his eyes. The facilitators played a game about exploring emotions and comment on how his body language looked sad. He exclaimed, “No! I’m not playing! I really am sad!” Participant 2 was observed to display emotional outbursts and irritability, at least twice in a session if he joined an activity mid-way or he was not assigned the role that he wanted to play. If it was not his turn, he would become disengaged, often looking out the window. In the first three sessions, he enthusiastically participated in approximately about 25% of activities, reluctantly participated about 50% of the time and chose not to participate about 25% of the time. General goals for Participant 2 were thus to increase: (1) enthusiastic participation; and (2) ability to transition smoothly, staying emotionally well-regulated.

2.6.3 Participant 3

Participant 3, according to the CCC-2 parent report measure, was within the normal range for her age on all communication domains. However, her areas of need were in social relations and coherence.

Participant 3 walked in to meet the primary investigator with a big smile on her face, eager to share what she had brought. She was observed to laugh appropriately at the primary investigator’s jokes although did not always answer questions correctly, sometimes
misinterpreting the question. For instance, when asked what kinds of things she does with her stuffed animals, she answered, “She can sit and lie down.” However, she answered questions with long sentences of six to seven words. Occasionally she showed difficulty with word order in a sentence for example, “And they was these ten for a half dollars.” She did not ask the primary investigator any questions in return but was always engaged when listening.

Upon meeting the group, Participant 3 sat on her chair with closed body language, only facing the facilitators. When asked to introduce herself, she spoke in a soft and quiet voice, often having to repeat herself. Another participant shared that they had Chinese food and she murmured, “I tried Chinese food. I didn’t like it.,” becoming quieter as she realized all eyes were on her. During games that required her to produce a loud and clear voice, often facilitators would ask her to repeat herself or say that again in a loud voice. However, she would speak in the same loudness on her second attempt. She was always willing to share and comment but did so in a timid way. When the group was asked who wanted a turn, she sat back and did not raise her hand. During “Simon Says” she did not participate. When asked why, she answered, “It’s too hard.” In the first three sessions, Participant 3 eagerly participated in activities approximately 10% of the time, reluctantly in approximately 50% of activities and not at all for 40% of activities. In addition, in activities that required her to produce a loud and clear voice, she would often speak indistinctly and quietly. General goals for Participant 3 were thus to: (1) increase enthusiastic participation; and to (2) speak in a clear and sufficiently loud voice.

2.6.4 Participant 4

According to parent report, Participant 4 had a mild communication impairment with areas of strength being initiation, scripted language, context and interests. Areas of need were in articulation, nonverbal communication and social relations.
Participant 4 walked into the assessment room to meet the primary investigator. He spoke in a low-pitched voice and was difficult to understand at first. However, when asked to repeat, he spoke in a clearer and louder voice. He read off the schedule for their assessment session, periodically looking up at the primary investigator. As their conversation continued, he began to talk in an audible register. He answered questions posed at him in long sentences of six to seven words in length. However, he was constantly fidgety. For instance, he got up off his chair a few times or began to play with items on the table. The primary investigator shared a little about herself and he made comments about what she said, occasionally asking her questions, showing that he was intrigued.

During treatment session one, Participant 4 kicked off his shoes right away and sat down next to the facilitator. He was very attentive while others were talking, giving them his full attention. Although he showed great eye contact and attention, his hands were constantly fidgety. He took on a passive role within the group. The facilitators asked, “Who wants to go next?” and he rarely raised his hand. Participant 4 was not observed to initiate participation during group activities unless specifically called upon and would use unacceptable self-regulatory body language at least three times during the initial sessions. General goal areas for Participant 4 thus were to: (1) maintain self-regulation through use of accepted body language for the context (e.g. hands by his sides); and (2) initiate participation within group activities.

2.6.5 Participant 5

According to parent report. Participant 5 had a mild-moderate communication impairment with areas of strength in initiation and scripted language and areas of need in social relations and nonverbal communication.
Participant 5 sat quietly in the chair and stared at the primary investigator with flat affect. She spoke in a quiet and soft voice. She appeared uncomfortable and so the primary investigator decided to share a bit about herself first. At first, Participant 5 only spoke when the primary investigator asked her a question, rarely initiating communication. When posed with a question, she was very thoughtful before responding; there were pauses of 5-10 seconds before she responded.

When it was Participant 5’s turn to introduce herself to the group, she spoke in a quiet and soft voice. The facilitators leaned in to try and hear her. During the first three sessions, in activities that required her to project her voice, she spoke in an unclear and quiet voice, and others sometimes would not understand. If she was asked to repeat herself, she would repeat but often at the same loudness level. She always participated in activities, although showed some reluctance. She did not fully commit to activities and often displayed a closed body language and flat affect. When a question was asked of the group, Participant 5 would never respond. If directly called upon, she took a very long time to respond, 15 to 20 seconds, which would interrupt the natural flow of the session. General goal areas for Participant 5 thus were to: (1) increase verbal response rate to questions; and to (2) speak in clear, sufficiently loud voice.

2.6.6 Participant 6

The parent report measure indicated that Participant 6 presented with a communication profile similar to those with ASD. His areas of strength were in semantics and initiation and areas of need in nonverbal communication, interests and social relations.

Upon initial meeting with the primary investigator, Participant 6 was eager to show her his drawing. He pointed out every little detail in it, as it was evident that he put a lot of time and effort into creating a work of art. After he shared, the primary investigator asked, “I brought
something to share. Do you want to know what my favourite food is?” He responded, “No. I want to know what your favorite thing is.” She went on to show him pictures of her dog. He looked up at her and interrupted, “What’s your favourite toy? Do you have a favorite toy?”, and they continued to talk about video games. He initiated, “I have a favorite toy.” When the primary investigator asked what it looks like he got up to draw it on the white board. He showed great initiation, asking questions, and showed great eye contact in a one to one context with an adult.

When it was time to move on, the primary investigator asked him if he would like to cross off what they have done on their visual schedule for the day. He told her that he wanted to colour it in. She allowed and after 15 seconds, began to pack up the crayons. “Wait! I’m not done yet!”, he said. Before they could move on, he had to make sure to colour in every corner of the square.

The beginning of session one began and before the facilitating SLP explained what they were about to do, Participant 6 ran over and gave her a cushion. She was sitting on the only chair without one and he had an extra one. As the activities were played, he was eager to participate, always with a smile on his face and occasionally laughing at himself but never making eye contact with others. The majority of his eye gaze was looking around the room at objects, rarely people. He had difficulty posing questions towards others during games that required him to ask others questions. The only questions asked were rhetorical in nature. For example, while playing a treasure hunt game, he uttered, “Where is it, where is it? I know!” The facilitators posed a question to the group during a magic wand game, and he was always very eager to answer.

“What is something we could turn someone into with this magic wand?”, they asked. He exclaimed, “Abracadabra I turn you into metal!” The facilitators praised him for his contribution but asked him to revise it to something simpler for them to act out. They suggested, “Maybe an animal, or a person or a tree?” He looked around intently and tried again, “Abracadabra I turn
you into a hydrium phylicia!” The activity stopped as participants were confused and asked what that was. He responded, “It’s an underwater plant!” like it is common knowledge. At baseline, Participant 6 was observed to often say things that were not relevant to the current situation, topic, events or participants. He had difficulty revising his answer when asked to clarify or elaborate. General goal areas for Participant 6 were therefore to: (1) increase amount of on-topic, relevant responses; and (2) ask questions directed at others.
Chapter 3: Results

Chapter 3 begins with a brief summary of participation in the program, then reports on the general language abilities of participants as background to the focus on social communication. Distal and proximal measures of social cognition and behaviour plus qualitative (parent and participant) feedback are then reported. Individual results for each participant’s program outcomes conclude the chapter in keeping with the case study design.

3.1 Participation

In order to know whether participants had sufficient opportunity to benefit from the program, participation is reported here. All participants attended the program eight or more times. Participants 2 and 5 were absent for two sessions, Participants 4 and 6 were absent for one session, and Participants 1 and 3 attended all 10 sessions. Participants 2, 3, 4, and 5 declined to participate in an activity at least once during the program. However, overall participants did participate in activities and how they participated was coded most often as enthusiastically and only occasionally as reluctantly. See Appendix K for a full summary of participant participation.

3.2 Language Sample Analysis

In order to gain background information on the participants’ general language abilities, conversational and narrative samples were elicited three times and analysed with SALT (Tables 3 and 4): at baseline (Times 1 and 2) and post-program (Time 3). Numbers reported are the means at the three assessment points. For conversational samples (Table 3), no main differences were seen for Type-Token Ratio (TTR) or percentage of maze words to total words comparing baseline to post-treatment scores. Post-treatment there was an increase in the number of utterances produced in the analysis set, total words, and mean turn length (in utterances).
Table 3 Means for Conversational Variables as Analyzed by SALT (Miller et al., 2012)

<table>
<thead>
<tr>
<th>SALT Measures</th>
<th>Time 1 Pre-baseline</th>
<th>Time 2 Post-baseline</th>
<th>Time 3 Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Utterances in Analysis Set</td>
<td>67.3</td>
<td>38</td>
<td>101.5</td>
</tr>
<tr>
<td>Type-Token Ratio (TTR)</td>
<td>0.48</td>
<td>0.5</td>
<td>0.38</td>
</tr>
<tr>
<td>Number of Total Words (NTW)</td>
<td>274.5</td>
<td>154</td>
<td>424.3</td>
</tr>
<tr>
<td>Mean Turn Length (words)</td>
<td>5.54</td>
<td>6.3</td>
<td>6.8</td>
</tr>
<tr>
<td>Percentage of Maze Words/Total Words</td>
<td>5</td>
<td>7</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Table 4 displays the SALT measures that were analyzed at all three assessment points for the narrative retell samples. Similar to the conversational sample, there were no main differences in TTR or percentage of maze words to total words over time. There was however, an increase in the total number of utterances in the analysis set and the total words at post-treatment (Time 3) as compared with baseline (Time 1 and 2).

Table 4 Means for Narrative Variables as Analyzed by SALT (Miller et al., 2012)

<table>
<thead>
<tr>
<th>SALT Measures</th>
<th>Time 1 Pretest</th>
<th>Time 2 Pretest</th>
<th>Time 3 Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Utterances in Analysis Set</td>
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<td>10</td>
<td>14.3</td>
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<tr>
<td>Type-Token Ratio (TTR)</td>
<td>0.58</td>
<td>0.54</td>
<td>0.57</td>
</tr>
<tr>
<td>Number of Total Words (NTW)</td>
<td>59.5</td>
<td>58</td>
<td>78</td>
</tr>
<tr>
<td>Percentage of Maze Words/Total Words</td>
<td>4.8</td>
<td>6.5</td>
<td>5.2</td>
</tr>
</tbody>
</table>

### 3.3 Measures of Social Behaviour and Cognition

In order to address areas of social behaviour and cognition, results from a variety of distal and proximal measures are reported. Distal measures included the SLDT-E, the False Belief Task, an Inferencing Task. a "Finish the Story" task, a Facial Processing Task and a Frequency of Reaction in Narrative Retell. The proximal measure was Goal Attainment Scaling.

Predictions were that InterACT participants would show an improvement in social cognition and behaviour, specifically, on measures of emotion recognition, embodiment, flexible thinking and inferencing. In addition, at post-treatment participants would improve on their
individual goals as measured by GAS, compared with baseline performance. Distal measures are reported on in the section below; proximal measures follow in Section 3.4.

3.3.1 Distal Measures

3.3.1.1 Social Language Development Test – Elementary

Tables 5 and 6 display the standard scores of Subtests A and C respectively, administered from the SLDT-E at Time 1 and Time 3. All standard scores not within normal range were within or close to within one standard deviation of the mean. On Subtest A: Making Inferences, the standard scores of Participants 1, 4 and 5 were higher post-treatment (with non-overlapping confidence intervals), while the remaining participants' scores remained approximately the same. Increased scores may represent random fluctuation around a mean over a short period of time, reflecting lack of test-retest reliability. One notable qualitative difference found post-program, however, was that Participants 1, 4, 5 and 6 were more likely to use first person language when asked to pretend they were the person in the photo and state what they are thinking, as the sub-test requires. For instance, the participant said: “I want to get out!” rather than “She wants to get out!” On Subtest C: Multiple Interpretations, the standard scores of Participants 2, 3, 5 and 6 were higher post-treatment than at baseline (with non-overlapping confidence intervals), while Participant 1’s standard score remained the same. Participants 2, 3, 5 and 6 were more likely to state two different logical and acceptable interpretations of a photograph post-program when compared with baseline, as required by the sub-test. For instance, Participant 5 was shown a picture of a man who looks upset and was asked to give two different ideas about what was going on. At baseline (Time 1) she stated, “He is thinking that his wife got stealed (stolen). Or his kids got stolen.” Post-treatment, the same picture was shown, and the participant said: “He is upset because his wife is disappointment (disappointed) in him. Or he could be tired from work.”
At baseline, Subtest C was discontinued during Participant 4’s assessment, because the task was deemed too difficult for the participant to complete at that time. However, Participant 4 did complete the task post-treatment, which may infer some progress, at least in test-taking. Overall, no definitive comments can be made on the participants’ performance post-treatment, however, due to the short time period for re-administration of a standard test.

### Table 5 Standard Scores and Confidence Intervals for SLDT Subtest A

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pre-treatment (Time 1)</th>
<th>Post-treatment (Time 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Score</td>
<td>Confidence Interval (95%)</td>
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<tr>
<td>1</td>
<td>100</td>
<td>96.5-103.5</td>
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<tr>
<td>2</td>
<td>72</td>
<td>65.12-78.88</td>
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<tr>
<td>3</td>
<td>95</td>
<td>91.04-98.96</td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>65.6-72.4</td>
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<td>5</td>
<td>81</td>
<td>79.68-82.32</td>
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<tr>
<td>6</td>
<td>116</td>
<td>114.68-117.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pre-treatment (Time 1)</th>
<th>Post-treatment (Time 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Score</td>
<td>Confidence Interval (95%)</td>
</tr>
<tr>
<td>1</td>
<td>75</td>
<td>72.4-77.6</td>
</tr>
<tr>
<td>2</td>
<td>69</td>
<td>65.32-72.68</td>
</tr>
<tr>
<td>3</td>
<td>83</td>
<td>79.54-86.46</td>
</tr>
<tr>
<td>4</td>
<td>Discontinued</td>
<td>n/a</td>
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<tr>
<td>5</td>
<td>101</td>
<td>100.14-101.86</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>74.14-75.86</td>
</tr>
</tbody>
</table>

### Table 6 Standard Scores and Confidence Intervals for SLDT Subtest C

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pre-treatment (Time 1)</th>
<th>Post-treatment (Time 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Score</td>
<td>Confidence Interval (95%)</td>
</tr>
<tr>
<td>1</td>
<td>75</td>
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</tr>
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<td>2</td>
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<td>83</td>
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<tr>
<td>4</td>
<td>Discontinued</td>
<td>n/a</td>
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</tr>
<tr>
<td>6</td>
<td>75</td>
<td>74.14-75.86</td>
</tr>
</tbody>
</table>

#### 3.3.1.2 False-Belief Task

All participants correctly answered the preliminary four questions asked before the theory of mind question, “Where will Sally look for her marble?”. At baseline (Time 1), two out of six (33%) participants passed the theory of mind task (Participants 4 and 5). Post-treatment (Time 3), four out of six (67%) participants passed the theory of mind task (all but Participants 3 and 6).
3.3.1.3 Inferencing Task: Finish the Story

Participants 2 and 3 improved on their ability to infer endings when you compare their responses from the baseline period to post-treatment. At beginning of baseline (Time 1) and end of baseline (Time 2) Participants 1, 4, 5 and 6 stated a suitable story ending. All participants at post-treatment (Time 3) stated relevant endings, thus showing some improvement on this task.

3.3.1.4 Frequency of Reaction in Narrative Retell

Table 7 displays the frequency of reference in the narrative retell samples. Participants 2, 5 and 6 increased their frequency of reference to how characters feel, think or react from baseline to post-treatment. No notable change was seen in the remaining participants. Participant 4 did not use reference at all and Participant 1 showed a decrease in the frequency of reference in his narrative at Time 3 as compared with Time 2. As a group, at the beginning of baseline assessment (Time 1) there were four instances of reference, by the end of baseline (Time 2), eight, and post-program (Time 3), ten. The small number of changes are likely spurious rather than reflective of program-induced change.

Table 7 Frequency of Reference During Narrative Retell

<table>
<thead>
<tr>
<th>Participant</th>
<th>Time 1 Beginning of Baseline</th>
<th>Time 2 End of Baseline</th>
<th>Time 3 Post-treatment</th>
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<tr>
<td>1</td>
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<td>6</td>
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<td>2</td>
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</tr>
<tr>
<td>Totals</td>
<td>4</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>
3.3.1.5 Facial Processing Task

No real improvement was observed within participants in their ability to label the emotions of the characters within the videos they were shown post-program as compared with baseline, with the exception of Participant 3, who did show improvement at Time 3. However, ceiling effects were observed at baseline (Time 1 and Time 2); thus little variance could be observed post-treatment.

In terms of embodying emotions, five out of six participants improved on their ability to embody emotions, even minimally. Participant 3 showed no improvement. Collectively, participants at Time 3 were observed to embody emotions on a greater scale, using more of their body or facial expression. Table 8 shows a summary of participant performance for labeling and embodying emotions during baseline (Time 1 and Time 2) and post-treatment (Time 3). Thus, participants showed an improvement in embodiment of non-social emotions; however, no change was observed in recognition of non-social emotions due to ceiling effects.
Table 8: Emotional Labeling and Embodying Scores

<table>
<thead>
<tr>
<th>Participant</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Surprised</th>
<th>%</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Scared</th>
<th>%</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Surprised</th>
<th>%</th>
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<th>Surprised</th>
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<th>Angry</th>
<th>Scared</th>
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<th>Angry</th>
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</tbody>
</table>
3.4 Proximal Measure

The proximal measure for the study was Goal Attainment Scaling. GAS scores are reported for participants as measured by observations from the early sessions (1 to 3) and late sessions (9 and 10) of the treatment program. A qualitative description of participant performance during the late sessions is provided at the end of this chapter in Section 3.7.

3.4.1 Goal Attainment Scaling Results

Table 9 displays a summary of the GAS raw scores based on the observations of participants’ performance in early treatment sessions (1 to 3) and at end of program (sessions 9 to 10). The initial GAS scores were rated with a score of -1. Post-treatment, 11 out of 12 goals showed positive effects. Of those 11 goals, four reached the expected outcome of 0 and seven surpassed expectations, achieving a score of +1 or higher. All children improved on both of their goals except for Participant 2, who only improved on one of his goals. If one obtains the difference between post-test and baseline means for each participant, the average of this difference indicates the average change in number of goal attainment levels, which was approximately 1.92 points per child.

Table 9 GAS Raw Scores in early and late sessions of the treatment program

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline (Sessions 1 to 3)</th>
<th>Post-Test (Sessions 9 and 10)</th>
<th>Differences between post-test means and baseline mean</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Goal 1</td>
<td>Goal 2</td>
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3.5 Parent Feedback

Of the six parent questionnaires mailed out, four were returned. See Appendix H for a copy of the parental questionnaire. None of the four parents reported that the program hindered their child’s abilities in any way. In terms of emotional awareness, three parents reported that their child’s emotional awareness of themselves remained the same while one parent reported that their child’s emotional awareness improved. Three parents reported that their child’s emotional awareness of others slightly improved while one parent reported that it remained the same. In terms of generalization, parents were asked if the program helped their child outside of the program. One parent reported that their child’s abilities remained the same while three parents reported that it slightly improved. When asked about the overall development of their child’s social communication after the program, three parents reported that it remained the same while one reported it slightly improved. In terms of confidence with social interaction, three parents reported it slightly improved and one reported it improved. Parents were also asked about their child’s feelings about the program. One parent said it was very positive, two said it was positive while one said neutral. In terms of the parent’s level of satisfaction, all four parents reported that they were satisfied with the service their children received during the program.

Additionally on the questionnaire, there were questions for parents to write their feedback regarding the program. Below are testimonials from parents.

What, if anything, were you hoping your child would get out of this experience?

“A reduced fear of speaking in public. Confidence. Louder speaking voice.”

“I was hoping my child could use his affinity (for drama) to aid in the development of social communication skills.”
“To be exposed to different children and adults, to gain more confidence in everyday social interaction, to develop new vocabulary.”

**What, if anything, has your child learned from this experience?**

“Unsure – enjoyed it but difficult to see what he gained.”

“This has been a great introduction for another therapy we are investigating next year using drama.”

“They are more aware of other children’s feelings and emotions and slightly were more confident in their speech and social contacts.”

**What, if anything, did you like about the program?**

“Was at a flexible time/days (weekend). He loved it and was so happy to go each day.”

“That is incorporated my child’s affinity for drama.”

“It was always on time; all the sessions took place. It was well informed about all the details and purpose of this research ahead of time. No bad surprises. Everybody was very friendly to the children.”

**What if anything, did you dislike about the program?**

“Nothing.”

“The fact that after the 3rd session it as shortened by 30 minutes.”

**If given the opportunity, would you consider participating in the program or a similar program again? Why or why not?**

“Yes – definitely as he enjoyed it so much.”

“Yes. I think it is valuable research and could aid in progressive therapies for ASD going forward.”
“Yes. It is a very interesting experience for children outside the school program. I owe generally very positive and supporting most of the researches since they can help other people nowadays and in the future.”

Additional Comments or Suggestions:

“Thank you! Would love to see some feedback on any program you saw in my child.”

3.6 Participant Feedback

Participant’s mean rating of the program was 4 on a 5-point Likert Scale. When asked if they would do this program or a similar program again, three out of six participants said they would and three said maybe, some giving the explanation that it would depend on their school and extracurricular schedule. When asked what, if anything, did they like about the program, three themes emerged, illustrated by using verbatim quotes: (1) Activities and Games, “I really liked the mirror game, I’ve played that at school before!”; (2) Forming meaningful relationships, “I got to meet new friends!”; and (3) Self-assurance, “It was great! I liked recording me and my partner. I liked seeing myself on the video.” When asked if anything, did they not like about it, four out of six participants said they did not dislike anything. The other two participants mentioned disliking the program coming to an end, showing others their commercial, specific activities or certain themes that were used. One participant mentioned, “I didn’t get to do all the activities and I got really sad at the end. And I didn’t want to show my parents the video it’s too dramatic.” The other participant commented, “I didn’t like the three little pigs theme. I already did that at school and I was tired of the three little pigs.”
3.7 Participant GAS Profiles During Late Sessions

Participants are described in more detail below based on their session behaviours during the last two sessions of the program. Each subsection is a description of the participant’s progress in terms of their GAS goal areas.

3.7.1 Participant 1 (GAS in Appendix B)

Participant 1’s first goal was to increase his ability to spontaneously jump into new activities that required flexible thinking. During the last session, participants were playing “Magic Wand” in which they used a wand to turn each other into different characters, animals or objects. The facilitator was explaining the game and said to Participant 1, “Abracadabra, I make you into a frog!” Participant 1 without hesitation embodied a frog for a couple seconds then stopped abruptly, “Do I have to act?” During another game they played, “Your Majesty” in which they had to embody a servant, serving the queen or king items of food they came up with, Participant 1 showed no hesitation and jumped right in. Participant 1 was observed to seek clarification only once during the final sessions during the introduction of a game that required flexible thinking. Therefore, his final GAS rating on this goal was 0, the expected outcome, i.e. showing one clarification request.

Participant 1’s second goal was to increase social interaction with peers. During Session 9, participants were instructed to play “Line Up”, a game in which they must line up according to height. Participant 1 and Participant 2 went back to back to see who was tallest. Participant 1 looked at the facilitator and asked, “Which one (is tallest)?” Then participants were instructed to line up according to the darkness of their shoes. Participant 1 stepped forward, “I have light shoes!” Participants with dark shoes were instructed to line up on the other side of the room. Participant 2 did not seem to be listening so Participant 1 tried to direct him, “Go over there.”
Participant 1 took on a leadership role within this game and began to help direct some participants to their spots, “There” he said to his peers throughout, making eye contact and pointing to where they should go in the line-up. Participant 6 made a comment, “My shoes are mostly black!” And Participant 1 replied in agreement, “There’s an outline” and pointed to the black line on them. When participants were then instructed to line up according to age.

Participant 6 asked Participant 1 how old he was. Participant 1 answered however, directed his answer to the facilitators at not Participant 6. The facilitators then asked Participant 2 how old he is. He stated his age in years and Participant 1 asked a follow up question directed at him, “Yeah. But by how many months?” His final GAS rating on this goal exceeded expectations and progressed to +2 because he during the last two sessions Participant 1 was observed to spontaneously ask a question or direct a statement towards a peer at least one time during the session.

3.7.2 Participant 2 (GAS in Appendix C)

Participant 2’s first goal was to increase enthusiastic participation within group activities. During the last two sessions, Participant 2 enthusiastically participated in approximately 25% of activities. He reluctantly participated in 50% of activities. He was often disengaged during activities, needing verbal encouragement to participate or sitting with closed body language facing the window. Participant 2 removed himself from one or two individual-based games, sitting out or asking to go to the washroom. Therefore, his final GAS rating on this goal remained the same, -1.

Participant 2’s second goal was to increase his ability to transition smoothly, staying well-regulated. Participant 2 joined in an activity mid-way during Session 9 because he was filming his commercial. He was given a description of what they had been playing and how to
play and he joined in smoothly without dysregulation. During Session 10, Participant 2 went to the washroom and joined into an activity, “Mirroring”. One facilitator was explaining what was involved in this activity. Participant 2 turned to the other facilitator and asked, “What’s after this? How many more minutes left?” the facilitator explained they will be doing some more activities and then showing their commercials. He replied, “No no I don’t want to!” Before the next activity, facilitators spoke to the group about showing their commercials to their family and friends and he said, “I don’t want to do it!” and looked displeased. His final GAS score on this goal was 0, expected outcome for this goal because when he joined in on an activity mid-way, when given a verbal description of what was going on and what was expected he only showed show signs of dysregulation once during the session.

3.7.3 Participant 3 (GAS in Appendix D)

Participant 3’s first goal was to increase enthusiastic participation. During the last two sessions, Participant 3 was extremely enthusiastic. She often raised her hand, smiling to participate and was not afraid to speak out or share when she had an idea. During Sessions 9 and 10, she willingly participated in all activities enthusiastically, with the exception of practicing her commercial. She showed some reluctance and needed much verbal encouragement during filming. However, she did overall enthusiastically participate in > 70% of activities. Her final GAS rating for this goal was +2, exceeding expectations.

Participant 3’s second goal was to speak in a clear, sufficiently loud voice. During activities that required her to project her voice loud and clear, she did so on her first attempt once during the session. During “Fruit Bowl” participants had to yell out a type of fruit or “fruit bowl” in order to get participants to move around the room. At the beginning of the game, facilitators explained, “When you’re in the middle you have to say it loud and clear.” During the activity,
Participant 3 was observed to be in the middle of the circle and yelled, “fruit bowl!” in a loud and clear voice. Later on when participants were practicing introducing themselves, she introduced herself in a moderate volume, getting softer as she went on. Her final GAS score for this goal was +1, more than the expected outcome because she was able to produce a loud and clear voice at least once during the session on her first attempt with verbal instruction.

3.7.4 Participant 4 (GAS in Appendix E)

Participant 4’s first goal was to maintain self-regulation through use of acceptable body language. Over the course of the program, notable improvement was observed in the body language of Participant 4. During the last two sessions, he was not as fidgety and used acceptable body language independently. He was observed to keep his hands on his lap or in his pockets. Participant 4’s final GAS score was +2, much more than expected outcome because during the last sessions, he used acceptable body language for the context.

Participant 4’s second goal was to initiate participation within group activities. During Session 9, participants were playing, “Live Board Game” in which they move around spaces in the room. In order to move, they had to ask each other questions posed on the cards and answer appropriately. The facilitator picked up a question card and looked at Participant 4. Participant 4 reached for it and said, “I can do it!”, volunteering to read out the question posed at Participant 5. During group activities that required turn-taking, Participant 4 was seen to initiate participation with given an indirect gestural cue. His final GAS score was +1 for this goal, a more than expected outcome but not +2 because he still required in direct gestural cue, i.e. facilitator looked in his direction, in order for him to initiate participation.
3.7.5 Participant 5 (GAS in Appendix F)

Participant 5’s first goal was to increase her verbal response rate to questions. When asked a question Participant 5 was able to promptly respond to a question at least one time during the session. During the line-up activity, a question was posed to the group, “Who has the black shoes?” and Participant 5 responded promptly, “I do!” and stepped forward. During the Live Board Game, for most of the questions she answered, she took 5-10 seconds, for instance, “Is your birthday in summer or winter?” and “Name three foods.” Or “Name a food you don’t like”. However, she was able to prompted answer two of the questions, “What is your teacher’s name?” and “When is your birthday?” Participant 5 received a GAS final score of +2, exceeding expectations because she was able to promptly respond to a question at least once during the last sessions.

Participant 5’s second goal was to speak in a clear and sufficiently loud voice. During the Live Board Game, before participants were able to pick up a question card, they had to say in unison, “Answer the question and see”. During this activity, Participant 5 used a soft voice initially. As the game progressed, her voice became louder and louder until eventually she was the loudest of the group. Another time was observed during the rehearsal of their introductions and commercials. Without any verbal cueing, she produced a loud and clear voice. During activities that required her to project her voice, without specific instruction, she was able to speak in a clear and loud voice independently at least one time during the last sessions. Thus, her final GAS score was +2 on this goal, exceeding expectations for loudness and clarity.

3.7.6 Participant 6 (GAS in Appendix G)

Participant 6’s first goal was to increase the amount of on-topic relevant responses. During the “Magic Wand” activity, Participant 6 directed the wand at the facilitator and said, “I
make you poo!” the facilitator replied, “No, think of something more appropriate.” Participant 6 then revised his answer, but still provided an irrelevant response, “I make you air!” The facilitator paused and said, “Can you see air? That’s difficult to act out. For example, think of something you can see or feel.” Participant 6 was able to revise his answer and said, “Abracadabra I make you a car!” When activities required Participant 6 to generating his own ideas, he still had difficulty generating a relevant response. However, when given an example of what a relevant response, he was able to revise his answer and make one relevant contribution to the current topic. Therefore, Participant 6 received a final GAS score of 0, achieving his expected outcome for this goal.

Participant 6’s second goal was to ask questions directed at others. During semi-structured activities that required participants to ask each other questions, he was able to generate a question directed at his peer. For instance, Participant 6 asked a question during the “Line Up” activity, “How old are you?” He was also able to read off a question card that was directed at another peer during the Live Board Game. However, did not make eye contact when asking his peers questions. Participant 6 received a final GAS score of 0, the expected outcome, because he was observed to ask a question direct at another however, did not use eye contact.
Chapter 4: Discussion

Chapter 4 begins with a summary of findings concerning the first research question and predictions regarding improvements in social behaviour and social cognition. Results are discussed generally in terms of social communication and previous literature, including regarding theory of mind. Participants' language abilities and parent feedback are then discussed. The chapter concludes with a discussion of clinical relevance and an overview of future directions in terms of methodology for measuring social communication, addressing the second research question for the study.

4.1 Study Questions

The current study was conducted in order to determine whether children with social-pragmatic difficulties, after participating in a 10-week drama-based intervention, InterAct, would show improved social communication skills and if so, what methodologies would be useful for documenting any changes or lack thereof. Effects are discussed for distal and proximal measures in turn.

4.1.1 Effects for Participants: Distal Measures

Our first prediction was that InterAct participants would show an improvement in relation to measures of emotional recognition, embodiment and flexible thinking and inferencing, as compared with baseline performance. Results suggest that some areas exhibited gains (inferencing, flexible thinking and emotion embodiment) while others did not (recognition of emotions). These specific areas are discussed in further detail below.

4.1.1.1 Inferencing

Standard scores for inferences improved slightly for three out of six participants (1, 2, 5), as measured by SLDT-E, Subtest A: Making Inferences. Whether that improvement was an
effect of the program or a lack of reliability in the initial test scores cannot be determined. However, two participants (2 and 3) did improve on their ability to predict a suitable ending to the story portrayed in the video. Many of the drama games played required participants to predict the status or behavior of others. Role-play facilitates may facilitate perspective-taking and thus, the ability to understand and predict the thoughts and feelings of others. Questions were posed during activities such as, “Why would someone do that?” “What is he going to do next?” “What would you do?” “What might he be thinking?” etc. which made participants more aware of the ‘other’. Canning (2013) found that facilitators asking “What if?” questions during imaginative play facilitated curiosity and creative thinking within typically developing children 3 to 4 years of age. Similarly, InterAct provided participants with a context to practice such skills. By taking on a role and drawing their attention to such signals within the game, this possibly led some children to form or state inferences about the internal thoughts and behaviour of others. However, further research would be required to determine the potential for such methods in enhancing inferencing.

4.1.1.2 Flexible Thinking

Gains were found in flexible thinking, as measured by higher scores (and non-overlapping confidence intervals) on the SLDT-E, Subtest C: Multiple Interpretations for four out of six children. Participant 4 was unable to complete this subtest at Time 1 and so no conclusion can be made regarding his performance and Participant 1’s standard scores remained the same. Again, however, test-retest reliability may be relevant in the use of this test, i.e. administering a test more than once in a short period of time. Children with social-affective difficulties can show low test-retest reliability (McArdell, 2010) and with increased familiarity with an experimenter, may show more of their skills with repeated test administration.
Irrespective of this, the content of the program may have had an influence on flexible thinking, because this was another area of cognition addressed in many of the games played. Games making use of imaginative play, role-play, physicalization and movement games, improvisation, and problem solving, all rely on a level of flexible, abstract thinking. For example, a game such as “Magic Object” required participants to come up with unconventional uses for a common object. Another example of a game requiring flexible thinking was one operating by chance, that is, “Hot Potato”. Problem solving and guessing games also required participants to come up with alternative solutions. “Statues” for example, involved children assuming a pose, while others had to come up with why might someone look like that. Many of these activities had an element of inference as well as flexible thinking, because children were asked to come up with multiple interpretations of the same pose. This caused participants to be exposed to different options, opinions and beliefs of the other children within the group and learn that there is more than one ‘right’ answer. According to Canning (2013), when children experiment with new thoughts and ideas through imagination within their play, they are more likely to develop flexible, creative thinking. Similarly, however, definitive statements about the direct effect of the program on the participants' skills cannot be made.

4.1.1.3 Emotional Recognition

Recognizing emotions was measured by showing participants photographs of characters within the videos they watched and asking them to label the emotion. The ability to label emotions in others was not found to change from baseline to post-treatment due to ceiling effects. This result is similar to those of Lerner et al. (2011) and Guli et al., (2013) who also found that the treatment group did not show improvement in detection of emotions, as measured by the DANVA-2 (Nowicki, 2004), which also tests non-social emotions. However, Williams
and Happe (2010) note that an important factor to keep in mind when testing emotion recognition in individuals with ASD is whether or not the emotion is social or non-social. Social emotions are dependent on social cognition because they emerge from one’s understanding of cultural context (Williams & Happe, 2010) and include emotions such as disappointment, guilt and embarrassment. It has been found that individuals with ASD can do well with recognizing non-social emotions, but have deficits in identifying such social emotions (Heerey, Keltner, & Capps, 2003). Thus, this probably speaks to the fact that participants in this study, who were asked to identify non-social emotions, did well with this task. (This relates also to theory of mind tasks as discussed later.)

However, another measure of emotional awareness derived from analysis of the narratives of the participants, i.e. whether participants spontaneously made reference to characters' states or emotions more frequently post-treatment than at baseline. Three of the participants (2, 5, and 6) made more reference to emotions post-program, possibly showing that they were more aware of other’s states and emotions. Participant 1 had a decrease in amount of reference at Time 3 as compared to Time 2. However, it is important to note that at Time 2, a different video was shown. When comparing his numbers of reference at Time 1 to Time 3, when the same video was shown, the amount of reference increased from zero to one mention. Perhaps he had greater interest in the second video or the contrasting dogs and their feelings were more likely to incur reference responses for that child. More research is needed on the types of stimuli that may engender reference from a variety of children.

Other data come from the parental questionnaire. Three of the four parents indicated that their child’s emotional awareness of others slightly improved.
4.1.1.4 Emotional Embodiment

When asked to embody emotions shown in pictures, participants were observed to embody emotions to a greater degree post-program than at baseline, using more of their body and facial expression. Drama may give an outlet to practice expressing acceptable emotional responses for the context, a key deficit in some children with ASD and social-pragmatic impairment (Yirmiya et al., 1989). In addition, many of the drama activities utilized deferred imitation, a known precursor to pretend play and role-play, which has been correlated with theory of mind abilities (Neilson & Dissanayake, 2004; Meltzoff & Gopnik, 1993). Perhaps practicing embodying the emotions further facilitates mentalization. Embodiment of emotions was observed distally, outside the program context. However, these measures were not embedded in real life scenarios and therefore, we are unable to conclude if this improvement is functional or generalizable to embodying emotions in naturalistic settings.

4.1.2 Effects for Participants: Proximal Measure, Goal Attainment Scaling

InterAct participants' social communication was predicted to show changes through GAS. This prediction appeared to be confirmed overall. The results were similar to those of Guli et al. (2013), who also found increase in positive interactions by watching participants during 20-minute observations (although these observations were made outside of their program, i.e. were more distal). As Schlosser (2004) points out, a positive attribute of GAS is that it measures the degree of change, which is beneficial when participants progress within treatment, however, still have a relatively low level of functioning (Schlosser, 2004). Standardized measures may fall short of capturing these subtle changes, as seen by studies who have used tools such as SSRS, SRS, BASC and DANVA-2 and found little significant effects (Lerner et al., 2011; Guli et al., 2013). All participants improved on both their goals in the current study, except for Participant 2
who improved on only one i.e. not on his level of engagement within the activities. It is difficult to say why Participant 2’s level of engagement did not change towards the end of the program; it was low at baseline but improved during the middle sessions, then decreased towards the end of the program. When looking back at specific activities that were played during those sessions, Participant 2 was more likely to be reluctant to participate or remove himself from activities when they were individually-based. He was more likely to enthusiastically participate in activities that were group-based, perhaps taking comfort in not being singled out. For instance, in Session 5, when Participant 2 was observed to enthusiastically participate 100% of the time, all games played that session were group-based games.

In addition, with study participants having differential social communication abilities and diagnoses, GAS showed to be an effective tool for measuring goals that were specific and important to participants. A positive attribute of GAS is that it allows for measuring change in a variety of social behavioural areas. Goals identified for participants were in a variety of areas, including increasing: (1) peer interaction; (2) enthusiastic participation; (3) production of a clear, loud voice; (4) ability to ask question directed at others; (5) on-topic relevant responses; (7) ability to initiate participation; (8) acceptable body language; (9) verbal responses; (10) spontaneity; and (11) ability to transition smoothly. To define the goals, the program facilitators were consulted, to ensure that goals were relevant for the participants and could be related to the social skill goals and activities of the program. Some of the goals, such as production of a clear and loud voice or body language were the main goals of some of the games and activities played. The remaining goals, such as making on-topic relevant responses, asking questions directed at others or transitioning smoothly, were goals structured within the activities, or the session. Note that there is a type of circularity to this, in that the goals were not independent of the treatment.
possibilities, and were known by the InterAct facilitators, who may have taught to the goals, once known. But that in fact is what intervention entails.

4.2 Theory of Mind

In Chapter 1, many pragmatic deficits were described to be accounted for by an inability to represent the mental states of others. These social cognitive skills are imperative for social functioning. Individuals with theory of mind deficits have difficulty taking in the listener’s perspective. Previous studies with individuals with social pragmatic deficits have shown that through use of theatre techniques that promote perspective taking, gains can occur in social functioning (Guli et al., 2013; Lerner et al., 2011). Theory of mind relies on a level of inferencing and flexible thinking; one must be able to shift perspective and predict the states and behaviours of others. With many of the drama activities relying on flexible thinking and inferencing, this potentially can contributed to improvements in theory of mind. Participants showed evidence of being able to take on the perspective of another. This was shown by the false belief task, because four out of six participants post-program answered correctly, as compared with two out of six participants at baseline (Time 1). Participant 3 and Participant 6 did not pass the false belief task post-program. This could potentially be due to the fact that they were two of the youngest participants in the program, one of which had a diagnosis of complex developmental behavioural condition and another, ASD. As mentioned, children with ASD generally pass false-belief tasks 5 years later than typically developing peers. Perhaps for other participants who were older, “theory of mind” was further along and drama gave it that boost they needed to be successful on a false belief task.
Moreover, during the SLDT-E Subtest A: Making Inferences, when children were asked to assume a role, Participants 1, 4, 5 and 6 were more likely to make first person statements post-treatment, showing that they were better able to take the perspective of another.

Additionally, activities that require perspective-taking, also assist with understanding emotions. As mentioned, individuals with ASD often demonstrate difficulties picking up on the social cues of others (Klin, Jones, Schultz, Volkmar, & Cohen, 2002). However, we saw an increase in the amount of emotion referencing in narratives, perhaps indicating that participants were more attentive to the emotions of others. Actors are trained to accurately read and respond to verbal and nonverbal cues on stage (Goldstein, 2011). Through enactment, children could practice expressing and embodying emotions.

To be able to generate and manipulate emotions, actors need control over their emotions. A drama therapy program could thus potentially lead to improved ability to regulate emotions, by encouraging reflection on emotion and different types of embodiment. The participant may learn adaptive and healthy strategies to cope when feeling a strong emotion. If one can infer the mental states of others and themselves, it may be easier to find an acceptable response in a situation that typically may engender strong emotions (Kasari et al., 2014).

The assumption of the Social Competence Framework is that gains in social cognition will lead to improvements in social behaviour (Kennedy & Adolphs, 2012). In this study, some of the gains found in GAS reflect this development concerning theory of mind. For instance, saying on-topic relevant responses requires a mental awareness of listener needs. Participant 6 produced more relevant responses towards the end of the program. Additionally, Baron-Cohen (1995) proposed that even the ability to speak excessively soft or loud shows that individuals with ASD do not have the ability to adapt their voices, showing they are unable to adapt to
listener needs. Participants 3 and 5 both improved on their ability to produce a loud and clearer voice. Children with these goals showed improvement in those social behaviours post-program, perhaps a result of gains in social cognition.

4.3 Other Effects: Language Abilities and Confidence

The fact that number of utterances and mean turn length increased post-treatment is interesting to note, even though it was not a specific goal for the participants. Drama creates an atmosphere where participants creatively contribute to a group, allowing participants to feel like they are active contributors, and that their contributions are received and supported (Godfrey & Heythrone, 2013). Participants practiced social skills in a safe environment and indirectly, developed their confidence in the process (Godfrey & Heythrone, 2013). Lerner et al. (2011) and Epp (2008) also found significant effects for the SSRS (Gresham & Elliot, 1990) assertiveness social skill, reflecting an increased confidence in expressing one’s opinions. In this present study, three parents reported that their child’s confidence with social interaction slightly improved and one reported that it improved notably. Some of the participants during their post-treatment interview about the program, also made reference to enjoying seeing themselves in a video and showing it to an audience. Perhaps this increase in mean turn length and total utterances reflects increased confidence with social interaction; children were possibly more comfortable in their abilities and more likely to take longer turns and contribute more to social interaction. This increase however, could be do with familiarity with the task or primary investigator.

4.4 Additional Note on Parental Feedback

Previous studies have found positive support for drama therapy as an intervention for targeting social communication (Godfrey & Haythrone, 2013; Guli et al., 2013). However, Lerner et al. (2011) is the only study to the primary investigator’s knowledge that controlled for
parental satisfaction and found no significant differences in parental satisfaction between the treatment group and control group. Parents in the present study indicated satisfaction with the drama program and the four parents who responded said they would do this program or a similar program again if given the opportunity. However, not all parents reported noticing improvements in social skills; as three of parents reported overall, they felt like their child’s development of social communication remained the same. This contrasts with Guli et al. (2013) who found that 75% of parents reported at least one or more specific changes. Perhaps no changes were reported due to the parents in the current study being unaware of their child’s goals. In addition, even though parents were aware that drama was being used to help facilitate social skills, they were not informed on what ‘social skills’ encompasses, and what was specifically targeted within the program. Therefore, their ability to comment or directly observe these skills was limited. Generalization of skills was not directed tested within this study; however, three of parents indicated that their child’s communication slightly improved outside of the program. This finding is similar to Guli et al. (2013) who showed generalization outside the program based on observed social interactions. We return to further methodological considerations in section 4.6, after discussing clinical implications of the current study.

4.5 Clinical Implications

Even though there is currently minimal research evidence to support drama therapy as an intervention method for enhancing social skills, this study shows promise such an approach, where interpersonal relationships are explored and social-cognitive skills are targeted through play and pretend. A major strength of drama is that it directly targets perspective-taking and stimulates growth in multiple domains of social communication through a multi-modal sensory mechanism (Landy, Weber, & Haem, 2005). Unlike social stories where individuals take a
passive role, drama allows participants to become active players. Drama encompasses many positive attributes of common social interventions used; story-telling, scripts, role-play and within group treatment. A number of drama strategies such as improvisation, role-play, imagination, scripting, modeling etc. can be utilized in treatment programs. A benefit of drama is that it replicates social interactions in the real world within the context of a supported environment, but without being too overwhelming (Lerner et al., 2011). Social attempts within the group are not met with rejection but rather accepted in a supported environment, which allows for rehearsal of such skills. Drama may be a channel for developing social cognition and behaviour, because both are addressed simultaneously. In addition, it is promising that this therapy technique can show gains for children with various profiles and severities showing adaptability of games and goals to fit individual needs. This shows potential for new techniques for addressing social skill impairments in a variety of individuals with social-pragmatic difficulties. However, with that said, further research is needed in order to understand the generalization of these social skills to real life situations.

In addition, group therapy for individuals with social pragmatic impairment is particularly important if one is trying to work on social skills with the end goal of facilitating relationships. For these children to be in direct contact with peers gives them exposure to other’s abilities, perspectives and develops tolerance. Group-based drama relies on successful group participation where every individual contributes in their own way.

The fact that Participant 2’s participation was enhanced in group-based activities rather than individualistic activities, may be worth noting for future facilitation of groups. Groups have the potential to function as a cohesive unit. Games that are team-oriented rely on participants working together, facilitating collaboration while taking the pressure off individuals (assuming
group rapport). Some children may respond better to group-based games, instead of individual-based activities which rely on performing in front of others. Others may perform more individual private activities. The therapist(s) need to work with participants and families to consider what will work best in the individual case. In addition, more studies are needed to help guide the clinical process, as discussed below.

4.6 Methodological Findings and Future Directions

The second major question of the study concerned methodology in evaluation of outcomes in drama therapy. Before discussing outcomes evaluation methods, it is necessary to identify other design features that limit interpretation. The current study utilized a pilot case-study design with six participants; therefore, results are limited in generalizability. Because there was no control group, gains from familiarity or maturation cannot be ruled out. Furthermore, any gains observed may not have been due to drama therapy in particular, perhaps only that it was a group-based treatment, for example. Future research is needed in order to determine generalizability of skills and maintenance. It would be interesting to study whether gains might also be found with other age groups, e.g. adolescence, because adolescence is a critical time for social development, as youth further develop social identity and peer groups (Happe & Frith, 2014).

Other than participant variables, outcomes measures also showed variable utility in observing changes or lacks thereof, both qualitative and quantitative measures. Regarding qualitative measures, some of the data was based on self-report like the CCC-2 and parent questionnaire, relying solely on the observations from family members that could have been biased or felt obligated to rate the program as excellent. Specificity in the questionnaire may also have limited the utility of the parent measure: three of the four parents who completed the
questionnaire indicated that the social communication skills of their child remained the same. Perhaps by informing parents about their child’s goal areas and speaking to what was being worked on within the program, parents would be more informed on what to look for in terms of social communication and how to help facilitate that outside the program. One future direction would be to further explore or follow-up with parents regarding their answers; it would have been beneficial to know any specific examples regarding changes that had occurred.

Relative to quantitative and distal measures, several participants appeared to improve on their standard scores on subtests of the SLDT-E. However, these results need to be interpreted with caution. A known limitation of the SLDT-E is test-retest reliability of subtests that range from 0.77 to 0.92 and standard error of measurement which ranges as high as 11 (Bowers et al., 2008). The larger the standard error, the less confidence one can have in the accuracy of the score. Inter-rater reliability of SLDT-E scoring was also not utilized in this study due to lack of resources but would be useful to determine inter-scorer reliability in future work. The use of repeated norm-referenced tests in a small time period is generally not recommended for outcomes evaluation. The SLDT-E was used because it is one of the only standardized measures known to test social communication in children as young as 6 years. However, it can often result in underestimating of change since the main purpose of these tests are to compare the child to others and not measure progress within a child. Alternately, it can overestimate change if a child seems to be improving on a test due to change or due to practice effects, while showing no change in abilities outside of testing. The current study was limited in its time-frame. Future studies, if using norm-referenced tests, should likely use them infrequently or over a longer duration of time which can yield some descriptive data about a client’s overall progress. Another alternative solution would be to use criterion-referenced measures, which look at a certain aspect
of communication; in this study language sample measures and GAS were used.

Further to distal measures, for theory of mind, the false belief task tested probably more than just theory of mind understanding. Children were expected to comprehend language within the story and the task required memory demands. Therefore, perhaps modifying the task to lessen these requirements may be beneficial for future studies.

In terms of emotional awareness, participants were asked to recognize the emotions of others. Non-social emotions were tested, which develop quite early. The non-social emotion measure showed ceiling effects. Similarly, three of the four parents who completed the questionnaire post-program said their child’s emotional awareness of themselves stayed the same while three said their emotional awareness of others slightly improved. Future studies, therefore might also test social emotions, which rely more on social cognition. In addition, participants might be asked specific questions such as, “What do you see that tells you they feel like that?” to see if they pick up on social context rather than speak to the physical properties of an emotion (e.g. because his mouth is open), something many children with ASD do in emotion recognition as a compensation strategy (Hobson, 1986).

Further to emotional awareness, a deficit commonly reported in ASD is the inability to describe emotions within oneself, which has been correlated with the ability to describe emotions in others (Happe & Frith, 2014). It was interesting to note, however, that spontaneously during the session when Participant 2 was emotionally upset, he was able to describe his state to the group, “I really am sad!” This type of veracity in emotional display was not tested, however. It would have been interesting to have participants recognize emotions in photographs or videos of others and in addition, have them describe their own previous experiences of those emotions, to see if they are able to internalize and reflect back on that emotion.
Additionally, it was discussed that emotional recognition may actually not be as impaired as once thought, but rather, that emotion regulation is the key deficit (Kasari et al. 2014). Within InterAct, during a story-telling activity, children were asked questions that helped support emotion regulation. For instance, “What should you do when you are mad?” Thus, a future direction for this intervention may be to utilize more activities that use strategies for adapting to different situations and demands of the environment.

Finally, as an addition to what has been done in previous studies, a proximal measure, GAS, was utilized to measure social behaviour and cognition, however only within the program. For future research it would be interesting to make observations in a more natural setting, perhaps seeing how participants interact during a break or outside of the program to see generalization of behaviours addressed by the goals, as in the study by Guli et al. (2013). A potential confound with GAS is that the number of opportunities for practicing each goal, something that was not taken into account in the current study. For example, many games worked on clear and loud articulation which were goals for Participant 3 and Participant 5. In contrast, activities working on perspective-taking and eye contact, which were targeted to a lesser degree, would have probably been areas to help facilitate Participant 6’s goals. This is important to note because that could influence why more change was seen in some participants over others. This could lead to the content of the program catering more to some participant’s goal areas over others.

On a similar note, facilitators were consulted when forming goal areas for the participants to ensure they reflected targets of the intervention. However, there seems to be a debate in the literature about whether or not facilitators of treatment should be aware of goal areas because they may cater towards the goal areas rather than focusing on other content of the program.
There seems to be a fine balance between clinician involvement within GAS used for research purposes. The limitation of having minimal facilitator involvement is that GAS levels should reflect what is observed within the treatment. For instance, some goal levels differed in the hierarchy of cueing. However, as much as the primary researcher tried to reflect what was being observed within the program, facilitators were sometimes more likely to use direct cueing rather than indirect and therefore, perhaps a goal level was not attained based on fewer opportunities to observe it within the program. GAS rating was completed by multiple raters. A benefit within the current study was the high reliability of GAS rating between raters. However, these raters were not blind to the treatment period. Therefore, they were subject to bias in the ratings. It would have been beneficial to have raters that were blind to the treatment period. In addition, most goals reflected program objectives; however, one has to ask if goal areas were a reflection of what was directly targeted. For instance, “level of engagement” was a goal area but was not directly targeted. Participants’ levels of engagement could be influenced by other factors such as comfort or familiarity.

It has also been found that awareness of goals can result in greater gains (King et al., 2000). Participants in this study were not directly aware of their specific goal areas. Perhaps for this population, knowing the specific program content beforehand and working with participants or families to select goals would have further ensured that goals were suitable for participants at that time.

Finally, it is important to stress that goal attainment for social behaviours is not purely a quantitative method, because behaviours are not necessarily equivalent within and across participants and goals. Krasny-Pacini, Hiebel, Pauly, Godon and Chevignard (2013) suggest using a third-party group to set goals to avoid goals being too simplistic, unrealistic or
inappropriate. On average, if goals have been met as expected, then the mean should be 0. It was observed that four goals reached an expected outcome, while seven goals exceeded their expected outcome possibly meaning that goals set were over-simplistic. Underestimating goals according to Schlosser (2004) could be a threat to internal validity. A number of alterations to the GAS methodology could enhance reliability and validity of outcome measures in future studies, e.g. utilizing a group to select goals, random allocation of goals, a multiple-baseline design across behaviours (goals) or use of a control group or control goals (Krasny-Pacini et al. 2013).

4.7 Conclusion

In conclusion, this study contributes to the growing body of literature on group-based drama interventions for targeting social (pragmatic) communication deficits in children. The first research question asked whether children participating in the 10-week program, InterAct, would show improved social communication. Some gains were apparent in certain aspects of social cognition and social behaviour - inferencing, flexible thinking, emotion regulation, theory of mind. However, to date there is no consensus on how to measure social communication skills. Thus, a second research question explored methodology for capturing gains in such skills. Two types of measures were used, distal measures (outside of the program) and proximal measures within the context of the program. Although some gains were found for some distal measures, with this population, questions remained about the reliability of those methods and their loose connection to the program. Informal measures of social behaviour and cognition were also utilized, such as emotional recognition and embodiment; however, it was difficult to generalize these results to social interactional gains in real-life settings. Qualitative measures of parent and participant feedback used in this study, although generally positive, may not have been sensitive
enough to capture participants' progress within the sessions and furthermore were subject to bias. In the end, the proximal measurement method, GAS, appeared to be a potentially more reliable method for directly observing progress, at least within the program. In future studies, GAS could also be completed outside of the program context as in Guli et al. (2013). Results of this study show promise for the use of the drama program InterAct, as a form of therapy for children with social skill deficits; however further research is needed, with larger sample sizes, control groups, different ages, and specific methodologies for capturing treatment effects, especially concerning GAS and questions of maintenance and generalization.
References


## Appendix A

### Constructs, Procedures, and Analyzed Variables

<table>
<thead>
<tr>
<th>Construct</th>
<th>Procedures</th>
<th>Variable(s)</th>
<th>Assessment Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Functioning</td>
<td>CCC-2</td>
<td>GCC (Standard scores, Percentile Rank)</td>
<td>Pre-program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIDI</td>
<td></td>
</tr>
<tr>
<td>Social Behavior Within Peer Group</td>
<td>GAS Goal Rating</td>
<td>Raw Scores</td>
<td>During Sessions 1 to 3 and Sessions 9 and 10</td>
</tr>
<tr>
<td>General Language Abilities</td>
<td>SALT Analysis of Conversational and Narrative Sample</td>
<td>Total number of utterances in analysis set, Number of total words, Type-Token ratio, Percentage of words to mazes, Mean turn length (in utterances)</td>
<td>Beginning and end of baseline, Post-program</td>
</tr>
<tr>
<td>Social Cognition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory of Mind</td>
<td>False-Belief Sally-Anne Task</td>
<td>Percentage of Correct Responses</td>
<td>Beginning of baseline, Post-program</td>
</tr>
<tr>
<td>Flexible Thinking</td>
<td>SLDT-E Subtest C: Multiple Interpretations</td>
<td>Standard score, Percentile rank</td>
<td></td>
</tr>
<tr>
<td>Inferencing</td>
<td>SLDT-E Subtest A: Making Inferences</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inferencing Task: Finish the Story</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Labeling Emotions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion Recognition</td>
<td>Reference in Narrative Retell</td>
<td>Percentage of Correct Responses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facial processing of narrative characters</td>
<td>Frequency of Reference</td>
<td></td>
</tr>
<tr>
<td>Emotion Embodiment</td>
<td></td>
<td>Level of Embodiment</td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>Parent Questionnaire</td>
<td>Mean Scaled Rating</td>
<td>Post-Program</td>
</tr>
<tr>
<td></td>
<td>Participant Questionnaire</td>
<td>Quoted responses</td>
<td></td>
</tr>
</tbody>
</table>

*Note. CCC-2 Children’s Communication Checklist 2; GAS Goal Attainment Scaling; SALT Systematic Analysis of Language Transcriptions; SLDT-E Social Language Development Test – Elementary; GCC General Communication Composite; SIDI Social Interaction Difference Index*
Appendix B

Goal Attainment Scaling Results for Participant 1

Goal Area 1: Ability to spontaneously jump in new activities that require flexible thinking

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong>&lt;br&gt;During the introduction of an activity that requires flexible thinking, without verbal encouragement, participant is able to jump in and does not seek clarification.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong>&lt;br&gt;During the introduction of an activity that requires flexible thinking, if given verbal encouragement, participant is able to jump in and does not seek clarification.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong>&lt;br&gt;During the introduction of an activity that requires flexible thinking, participant seeks clarification once during the session. Even if given verbal encouragement, he shows hesitation before jumping in and strict adherence to concrete rules.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong>&lt;br&gt;During the introduction of an activity that requires flexible thinking, participant seeks clarification twice during the session (e.g. “I have a question, what if…” or “can we…”). Even if given verbal encouragement (e.g. “Let’s move through a marshmallow world. What do you think it would feel like? How might you walk?”), participant shows hesitation before jumping in.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong>&lt;br&gt;During the introduction of an activity that requires flexible thinking, participants seeks clarification at least three times during the session. Even if given verbal encouragement, the participant shows hesitation before jumping in.</td>
</tr>
</tbody>
</table>

Goal Area 2: Social Interaction with peers

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong>&lt;br&gt;During the session, participant will spontaneously ask a question or direct a statement towards a peer at least one time.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong>&lt;br&gt;During the session, participant does not direct his statements or questions towards peers. When given an indirect gestural cue, (e.g. facilitator points to who he should direct his question/statement at) participant will directly ask his peer a question.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong>&lt;br&gt;During the session, participant does not direct his statements or questions towards peers. When given an indirect verbal cue, (e.g. “how could we find that out?”) participant will directly ask his peer a question.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong>&lt;br&gt;During the session, participant does not direct questions or statements towards peers but only towards facilitators. When given a direct verbal cue (e.g. “Ask him”) participant will not ask his peer a question.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong>&lt;br&gt;During the session, participant does not direct questions or statements towards peers. When given a model, participant will not ask his peer a question.</td>
</tr>
</tbody>
</table>

1Highlighting indicates level attained throughout Appendices B-G
Appendix C

Goal Attainment Scaling Results for Participant 2

Goal Area 1: Increase enthusiastic participation

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| +2    | **Best anticipated treatment success**  
During the session, participant eagerly participates in approximately 100% of activities. |
| +1    | **More than expected success with treatment**  
During the session, participant enthusiastically participates in approximately 75% of activities. |
| 0     | **Expected outcome level of treatment success**  
During the session, participant enthusiastically participates in approximately 50% of activities. |
| -1    | **Participant’s baseline performance on a given goal**  
During the session, participant enthusiastically participates (shows excitement, willingness to participate) in approximately 25% of activities. Participant reluctantly participates (needs verbal encouragement, moans, looks annoyed or disengaged while participating) in 50% of activities and chooses not to participate (removes himself from activity) 25% of the time. |
| -2    | **Most unfavourable treatment outcome thought likely**  
Participant enthusiastically participates < 25% in activities. |

Goal Area 2: Ability to transition smoothly, staying emotionally well-regulated

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| +2    | **Best anticipated treatment success**  
When the participant joins in on an activity mid-way, without given a verbal description of what is going on and what is expected, participant is able to transition smoothly without getting emotionally upset. |
| +1    | **More than expected success with treatment**  
When the participant joins in on an activity mid-way, when given a verbal description of what is going on and what is expected, participant will transition smoothly without getting emotionally upset. |
| 0     | **Expected outcome level of treatment success**  
When the participant joins in on an activity mid-way, when given a verbal description of what is going on and what is expected (e.g. “we are going to play a mirror game, in this game you are going to do X”) participant will show signs of dysregulation once. |
| -1    | **Participant’s baseline performance on a given goal**  
When the participant joins in on an activity mid-way, participant dysregulates at least twice throughout the session. He has difficulty managing an intense emotional feeling which results in him crying out loud and/or protesting e.g. “no please please I want to do the other activity” or “No no I want to be the marble dropper”. He is difficult to motivate and has difficulty smoothly transiting into the new activity. |
| -2    | **Most unfavourable treatment outcome thought likely**  
When participant joins in on activity mid-way, participant dysregulates > twice throughout the session. He has difficulty managing an intense emotional feeling, is difficult to motivate and does not use an acceptable way to communicate refusals or negotiate. |
### Goal Area 1: Increase enthusiastic participation

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During the session, participant enthusiastically participates in &gt; 70% of activities.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During the session, participant enthusiastically participates in &gt; 50% of activities.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During the session, participant enthusiastically participates in &gt; 30% of activities.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>During the session, participant enthusiastically participates (shows excitement, willingness to participate) in approximately 10% of activities. He reluctantly participates (needs verbal encouragement, moans, looks annoyed or disengaged while participating) in 50% of activities and chooses not to participate (removes herself from activity because she doesn’t like it or it is “too hard”) in activities 40% of the time.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>During the session, participant enthusiastically participates in &lt; 10% of activities.</td>
</tr>
</tbody>
</table>

### Goal Area 2: Speak in a clear and sufficiently loud voice

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During activities that require her to project her voice, without specific instruction, participant speaks in a clear and loud voice independently at least one time.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During activities that require her to project her voice, with specific instruction, participant produces a loud and clear voice on first attempt at least one time.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During solo activities that require her to project her voice, with given specific instruction, participant speaks in an unclear quiet voice. When asked to repeat herself or try again, participant produces a louder and clear voice on her second attempt.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>During activities that require her to project her voice, when given specific instruction (e.g. say that loud and clear), participant speaks in an unclear quiet voice, others sometimes unable to understand. When asked to repeat herself or try again, she speaks in the same loudness on second attempt.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>During activities that require her to project her voice, when given specific instruction (e.g. say that loud and clear), participant speaks in an unclear quiet voice, others sometimes unable to understand. When asked to repeat herself or try again, she speaks in the same loudness on three or more attempts.</td>
</tr>
</tbody>
</table>
# Appendix E

Goal Attainment Scaling Results for Participant 4

## Goal Area 1: Maintains self-regulation through use of acceptable body language

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During the session, participant uses acceptable body language.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During the session, participant uses acceptable body language one time. When given a verbal and/or visual reminder, participant is able to redirect behaviour.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During the session, participant uses unacceptable body language for the setting two times. When given a verbal reminder and/or visual reminder, participant is able to redirect his behaviour in that moment.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>During the session, participant uses unacceptable self-regulatory body language at least 3 times. When given a verbal reminder (e.g. “hands on sides”) and/or visual reminder (e.g. hand signal to stop), participant is able to redirect his behaviour in that moment.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>Participant uses unacceptable self-regulatory body language three or more times during the session.</td>
</tr>
</tbody>
</table>

## Goal Area 2: Initiate participation in group activities

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During activities that require turn taking, without a verbal or directional cue, participant will independently initiate participation at least once during the session.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During activities that require turn taking, participant does not initiate participation during group activity on his own unless given an indirect gestural cue (e.g. looking in his direction or pointing to him).</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During activities that require turn taking, participant does not initiate participation during group activity on his own unless given an indirect verbal cue (e.g. “has everyone went?” or “anyone else like to try?”).</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>During activities that require turn taking, participant does not initiate participation during the group activity on his own unless given a direct verbal cue (e.g. “Participant 4, would you like to try?”).</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>During activities that require turn taking, participant does not initiate participation during the group activity, even if given a direct verbal cue (e.g. “Participant 4, would you like to try?”).</td>
</tr>
</tbody>
</table>
## Appendix F

Goal Attainment Scaling Results for Participant 5

### Goal Area 1: Increase verbal response rate to questions

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>When asked an open-ended question, participant promptly responds (within 5 seconds) at least once.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>When asked an open-ended question, participant takes a long time to respond (5-10 seconds) at least once.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>When asked an open-ended question, participant takes a long time to respond (10-15 seconds) at least once.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>When asked an open-ended question, participant takes a long time to respond (15-20 seconds).</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>When asked an open-ended question, participant takes a long time to respond (20-25 seconds).</td>
</tr>
</tbody>
</table>

### Goal Area 2: Speak in a clear and loud voice

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During activities that require her to project her voice, without specific instruction, participant speaks in a clear and loud voice independently at least one time.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During activities that require her to project her voice, with specific instruction, participant produces a loud and clear voice on first attempt at least one time.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During activities that require her to project her voice, with given specific instruction, participant speaks in an unclear quiet voice. When asked to repeat herself or try again, participant produces a louder and clear voice on her second attempt.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>During activities that require her to project her voice, when given specific instruction (e.g. say that loud and clear), participant speaks in an unclear quiet voice, others sometimes unable to understand. When asked to repeat herself or try again, participant speaks in the same loudness on second attempt.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>During activities that require her to project her voice, when given specific instruction (e.g. say that loud and clear), participant speaks in an unclear quiet voice, others sometimes unable to understand. When asked to repeat herself or try again, she speaks in the same loudness on third + attempts.</td>
</tr>
</tbody>
</table>
## Appendix G

Goal Attainment Scaling Results for Participant 6

### Goal Area 1: Give relevant, on-topic responses

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>When generating his own ideas, participant will make at least one relevant contribution to the current topic, event or participants on his own without a verbal cue or model.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>When generating his own ideas, participant may say something irrelevant to the current situation, topic or event. When given a verbal cue (e.g. “That’s too difficult. Think of something else.”) participant will revise his answer, making one relevant contribution.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>When generating his own ideas, participant may say something irrelevant to the current situation, topic or event. When given a model of what a suitable response would be (e.g. “Let’s think of something easier. Like for example…”) participant will revise his answer, making one relevant contribution.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>When generating his own ideas, participant consistently says things that are not relevant to the current situation, topic, event or participants (e.g. “What should you turn him into?” Participant 6: “I turn you into metal!”) When asked to revise his answer, even given a model of what a suitable answer may be, participant does not choose an idea that is more relevant.</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>When generating his own ideas, participant consistently says things that are not relevant to the current situation, topic, event or participants. When asked to revise his answer, participant does not choose an idea that is more relevant.</td>
</tr>
</tbody>
</table>

### Goal Area 2: Asking questions directed at others

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td><strong>Best anticipated treatment success</strong></td>
<td>During games that require participants to ask each other questions, participant can ask a peer a two questions and makes periodic eye contact.</td>
</tr>
<tr>
<td>+1</td>
<td><strong>More than expected success with treatment</strong></td>
<td>During games that require participants to ask each other questions, participant can ask a peer a question and makes periodic eye contact.</td>
</tr>
<tr>
<td>0</td>
<td><strong>Expected outcome level of treatment success</strong></td>
<td>During games that require participants to ask each other questions (e.g. Live Board Game) participant can ask a peer a question, however makes no eye contact.</td>
</tr>
<tr>
<td>-1</td>
<td><strong>Participant’s baseline performance on a given goal</strong></td>
<td>Within semi-structured activities (e.g. Treasure Hunt or Guessing Games) that require participants to ask each other questions, participant does not make eye contact with peers or ask questions directed at others. His questions are all rhetorical in nature (e.g. “Is it over here? Is it over here? No!”)</td>
</tr>
<tr>
<td>-2</td>
<td><strong>Most unfavourable treatment outcome thought likely</strong></td>
<td>Within semi-structured activities, participant does not formulate any questions, directed at others or rhetorical in nature.</td>
</tr>
</tbody>
</table>
Appendix H

Post-Program Parent Questionnaire

Dear Parent/Guardian,

Please complete this questionnaire to help us understand your thoughts and opinions about your child’s participation in the program InterAct. It takes approximately 15 minutes to fill out. Your answers will be combined with those of other parents whose children participated in the program. To make your answers anonymous, we do not ask for your name or any identifying information on the form.

What, if anything, were you hoping your child would get out of this experience?

What, if anything, has your child learned from this experience?

What, if anything, did you like about the program?

What, if anything, did you dislike about the program?

If given the opportunity, would you consider participating in the program or a similar program again? Why or why not?
Circle the number that corresponds to your honest opinions about each statement:

Social communication is using words and/or your body (eye gaze, facial expression, gestures) to tell others what you want, express feelings, share ideas, solve problems and build relationships. Overall, my child’s development of social communication throughout the program was…

<table>
<thead>
<tr>
<th>Considerably worse</th>
<th>Worse</th>
<th>Slightly worse</th>
<th>The same</th>
<th>Slightly improved</th>
<th>Improved</th>
<th>Greatly improved</th>
</tr>
</thead>
</table>

My child’s feelings about the program were …

<table>
<thead>
<tr>
<th>Very negative</th>
<th>Negative</th>
<th>Slightly negative</th>
<th>Neutral</th>
<th>Slightly positive</th>
<th>Positive</th>
<th>Very positive</th>
</tr>
</thead>
</table>

My child’s emotional awareness (i.e. their capacity to recognize their own emotions e.g. “I am feeling sad.”) of themselves was…

<table>
<thead>
<tr>
<th>Considerably worse</th>
<th>Worse</th>
<th>Slightly worse</th>
<th>The same</th>
<th>Slightly improved</th>
<th>Improved</th>
<th>Greatly improved</th>
</tr>
</thead>
</table>

My child’s emotional awareness of others (i.e. their capacity to recognize other’s emotions e.g. “He is feeling sad.”) was…

<table>
<thead>
<tr>
<th>Considerably worse</th>
<th>Worse</th>
<th>Slightly worse</th>
<th>The same</th>
<th>Slightly improved</th>
<th>Improved</th>
<th>Greatly improved</th>
</tr>
</thead>
</table>

My child’s confidence with social interaction…

<table>
<thead>
<tr>
<th>Considerably worse</th>
<th>Worse</th>
<th>Slightly worse</th>
<th>The same</th>
<th>Slightly improved</th>
<th>Improved</th>
<th>Greatly improved</th>
</tr>
</thead>
</table>

To what degree did the program InterAct help your child outside of the program?

<table>
<thead>
<tr>
<th>Hindered much more than helpful</th>
<th>Hindered slightly</th>
<th>Neither helped nor hindered</th>
<th>Helped slightly</th>
<th>Helped</th>
<th>Helped very much</th>
</tr>
</thead>
</table>

Are you satisfied with the service your child received during this program?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Slightly dissatisfied</th>
<th>Neutral</th>
<th>Slightly satisfied</th>
<th>Satisfied</th>
<th>Extremely satisfied</th>
</tr>
</thead>
</table>

Would you recommend the program InterAct to a friend or relative?

<table>
<thead>
<tr>
<th>Strongly not recommend</th>
<th>Not recommend</th>
<th>Slightly not recommend</th>
<th>Neutral</th>
<th>Slightly recommend</th>
<th>Recommend</th>
<th>Strongly recommend</th>
</tr>
</thead>
</table>

Any additional comments or suggestions?
Appendix I

5-Point Visual Likert Scale

absolutely loved it!  ➡  ➡  ➡  ➡

didn’t love it at all
## Appendix J

Type of Activity and Amount of Time Played

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Activity List(^2)</th>
<th>Minutes Played</th>
<th>Percentage of Time</th>
</tr>
</thead>
</table>
| Icebreakers      | – Initial Introductions  
                    – Name game with ball | 18             | 3%                |
| Imaginative Play | – Orchestra          
                    – Magic Wand        
                    – Magic Chair        
                    – Magic Mirror       
                    – Magic Object       
                    – Object Manipulation 
                    – Body Guessing game 
                    – Create a troll    | 77              | 13%               |
| Role Playing     | – Bus                
                    – Troll Press Conference 
                    – Goat Characterization 
                    – Masks and Hats      
                    – Yes your majesty    
                    – Creating a Troll with Three Bodies 
                    – Scene Work:         
                        o Three Little Pigs 
                        o Little Red Riding Hood 
                        o Three Billy Goats Gruff 
                        o Three Little Bears | 112             | 19%               |
| Physical/Movement Games | – Stop Light       
                          – Machine game        
                          – Environments        
                          – Passing Facial Expression 
                          – Hot Potato          
                          – Simon Says (regular, emotions, sequencing) 
                          – Stretching activity 
                          – Charades            
                          – Mirroring Game      
                          – Slow Motion Tag     
                          – Statues             
                          – Ball Pass           
                          – Freeze Dance        
                          – Fruit Bowl         | 155             | 27%               |

\(^2\) Author can be contacted for more detail on activities.
<table>
<thead>
<tr>
<th>Category</th>
<th>Activity</th>
<th>Percent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scripting</td>
<td>Emotion Poem</td>
<td>54</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Introductions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practicing Commercials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Treasure Hunt</td>
<td>97</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Guess and Describe</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change One Thing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three pieces of paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Line Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Live board game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening and Reviewing Fairy Tales</td>
<td>Billy Goats Gruff</td>
<td>25</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Wolf’s Side of the Story</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Little Red Riding Hood</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paper Bag Princess</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflection and discussion</td>
<td>Wrap Up Session 1</td>
<td>48</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Wrap Up Session 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wrap Up Session 3</td>
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<tr>
<td></td>
<td>Wrap Up Session 4</td>
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</tr>
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<td></td>
<td>Wrap Up Session 5</td>
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<td></td>
<td>Wrap up Session 8</td>
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<tr>
<td></td>
<td>Wrap up Session 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Giving feedback</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix K

### Summary of Participant Participation

<table>
<thead>
<tr>
<th>Participant</th>
<th>Level of Participation in Activities</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Enthusiastic</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Enthusiastic</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>Enthusiastic</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td>37.5%</td>
</tr>
<tr>
<td>4</td>
<td>Enthusiastic</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td>17%</td>
</tr>
<tr>
<td>5</td>
<td>Enthusiastic</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>Enthusiastic</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Reluctant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Did Not Participate</td>
<td></td>
</tr>
</tbody>
</table>

*Participant 5 was absent for Session 10 but present for the showing of commercials*