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The Effects of Social Communication Intervention on Emotion Inferencing in Children with Developmental Language Disorder

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A thesis submitted to the faculty of
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ABSTRACT

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Children with Developmental Language Disorder (DLD) often face problems in areas of social communication including negotiating with peers, entering ongoing interactions, and engaging in conflict resolution. A potential cause of these social communication difficulties is the decreased ability to make emotional inferences. This thesis investigates the effects of a social communication intervention on the ability of school-aged children with DLD to make inferences about emotions. Five children with DLD between the ages of 6;10 and 12;4 participated in a social communication intervention that highlighted principles of emotion understanding (recognizing emotions in facial expressions, inferring emotions with contextual information, and discussing reasoning behind emotions) using story books to illustrate concepts. Data were gathered before and after intervention using a psychometrically balanced measure of emotional inferencing ability. Results revealed notable improvements in three of the participants and consistent performance in two of the participants baseline to follow-up. While performance on the emotional inferencing task varied due to multiple factors, the participants that showed improvement produced real growth which encourages future research to be conducted.

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DESCRIPTION OF THESIS STRUCTURE

This thesis, the Effects of Social Communication Intervention on Emotion Inferencing in Children with Developmental Language Disorder, is organized in a hybrid structure combining traditional thesis requirements and current journal publication formats. The preliminary pages of the thesis reflect requirements for submission to the university. This thesis report is presented as a journal article and conforms to length and style requirements for submitting research reports to education journals. A review of the literature is included in the annotated bibliography located in Appendix A. Appendix B includes the measure used to measure changes in emotional inferencing pre- and post-intervention. Appendix C includes the permission form distributed to the parents of the participants involved in the study.

Introduction

Statement of Purpose

Children with developmental language disorder (DLD) find difficulty in a variety of social tasks, including joining ongoing interactions (Brinton, Fujiki, Spencer, & Robinson, 1997; Craig & Washington, 1993; Liiva & Cleave, 2005), resolving conflicts (Horowitz, Jansson, Ljungberg, & Hedenbro, 2005; Timler, 2008), and negotiating with peers (Brinton, Fujiki, & McKee, 1998). These issues are often associated with a range of social challenges, including problematic relationships with peers (Durkin & Conti-Ramsden, 2007) and higher rates of social withdrawal (Fujiki, Brinton, Morgan, & Hart, 1999; Fujiki, Spackman, Brinton, & Hall, 2004). Although it is likely that language deficits play a significant role in these problems (Redmond & Rice, 2002), there is also evidence that factors other than language may be influential (Fujiki et al., 2004). One such behavior is the ability to make inferences about the emotions of others. The purpose of this study was to examine the effects of a social communication intervention on emotional inferencing among children with DLD.

Emotion Understanding

According to Saarni (1999), emotion understanding involves the "ability to discern and understand others' emotions, using situational and expressive cues that have some degree of cultural consensus as to their emotional meaning" (p. 106). Denham (1998) explained that emotion understanding involves a number of developmental areas, including identifying facial expressions of emotion, understanding the causes of emotions, interpreting emotions conveyed in vocal prosody, and recognizing more complex emotions such as embarrassment and shame.

Recent work has suggested that children with DLD have difficulty with basic emotion understanding tasks, such as identifying emotion on faces (Delaunay-El Allam, Guidetti, Chaix,

& Reilly, 2011; Spackman, Fujiki, Brinton, Nelson, & Allen, 2006; Taylor, Maybery, Grayndler, & Whitehouse, 2015) and identifying emotion in prosody (Boucher, Lewis, & Collis, 2000; Fujiki, Spackman, Brinton, & Illig, 2008; Lindström, Lepistö-Paisley, Vanhala, Alén, & Kujala, 2016). These children also have problems with more complex emotion understanding tasks, such as dissemblance, or hiding an experienced emotion when it is socially appropriate to do so (Brinton, Fujiki, Hurst, Jones, & Spackman, 2015; Brinton, Spackman, Fujiki, & Ricks, 2007). Within the context of emotion understanding, some studies suggest that children with DLD have difficulty making inferences concerning emotions; these studies are reviewed in detail below.

Inferencing and DLD

One aspect of emotion understanding that is of particular importance is the ability to make inferences about emotions. In considering this ability in children with DLD, it is important to recognize that these children have difficulty with inferencing in general. For example, Karasinski and Ellis Weismer (2010) found that children with DLD had more difficulty than typically developing children in making inferences during discourse when presented with a neutral narrative. Additionally, these authors also found that deficits in linguistic comprehension and working memory in children with DLD were predictors of the inability to infer information.

Adams, Clarke, and Haynes (2009) also found that children with DLD had difficulty making inferences. Adams et al. reported that children with DLD with marked deficits in pragmatics struggled even more to make inferences than children with DLD without marked pragmatic deficits. Additionally, children with DLD did not make inferences as well as their typically developing age-matched peers. The children with DLD performed more like their younger, language-matched peers while completing inference tasks.

Adams, Lockton, Gaile, Earl, and Freed (2012) argued that deficits in language comprehension were a contributing factor to the inability to make inferences in children with DLD. Different researchers have speculated that these problems may stem from language comprehension deficits, limited working memory, poor social competence, and short vocal response time (Adams, et al., 2009; Ford & Milosky, 2003; Ford & Milosky, 2008; Karasinski & Ellis Weismer, 2010).

Children with DLD also have difficulties making inferences about emotion that appear to extend beyond their linguistic problems. Vendeville, Blanc, and Brechet (2015) evaluated the capacity of children with DLD to infer emotions in a drawing task, which did not rely on linguistic responses. These researchers found that inferencing deficits in children with DLD hindered their ability to draw images of the target emotions. Vendeveill et al. concluded that inferencing deficits were not a result of an impairment of expressive language. The children with DLD involved in the study struggled to interpret and infer emotions independent of their vocabulary deficits.

Ford and Milosky (2003) tested the ability of children with DLD to infer emotional reactions compared to that of their typically developing age-matched peers. The participants were presented a story in which the main character was likely to experience a specific emotion, and the participants selected a picture of a facial expression that matched the character's emotion in the story. Ford and Milosky (2003) found that children with DLD did not infer emotions as accurately as typically developing children. In addition, children with DLD tended to make valence errors, such as mistaking happy for angry when the emotion was labeled inaccurately. Children with typically developing language make inferences during the process of discourse

comprehension while children with language impairment struggle to make inferences in conversation.

Ford and Milosky (2008) examined the ability of children with DLD to infer emotional reactions and found that children with DLD do not make inferences during discourse comprehension like their typically developing age-matched peers. These researchers suggested that children with DLD did not utilize emotion knowledge to infer the emotions of others. Additionally, children with DLD did not make emotional inferences during discourse whereas typically developing children inferred emotions while processing verbal information. Ford and Milosky also found social competence, language, and vocal response time are factors in predicting inferencing ability among children with DLD.

Spackman, Fujiki, and Brinton (2006) also used the same Chris inferencing task to measure emotion inferencing abilities with older children. Their study also found that children with DLD had specific deficits in emotion inferencing.

Although the studies discussed above show that children with DLD have particular difficulty making inferences about emotions, few studies have examined interventions to improve the ability of children with DLD to infer emotions. In part, this is a reflection of the relatively small number of studies that have been conducted examining social communication skills in children with DLD in general (Gerber, Brice, Capone, Fujiki, & Timler, 2012). However, even as the number of social communication intervention studies has grown (e.g., Adams et al., 2012; Fujiki, Brinton, McCleave, Anderson, & Chamberlain, 2013; Stanton-Chapman, Denning, & Jamison, 2010; Stanton-Chapman & Snell, 2011), few of these studies have addressed emotion inferencing. To address this need, the current investigation was designed to provide a preliminary evaluation of an intervention designed to improve the ability

of children to make inferences about the emotion an individual would experience given a particular context. The study addressed the following research question: Will a social communication intervention improve the ability of children with DLD to infer emotions as measured by an inferencing task involving short stories administered before and after treatment?

Method

Participants

Six school-aged students between the ages of 6;9 and 12;3 years participated in the study. Each participant was a student at an elementary school, and the school speech language pathologist had identified each participant as having DLD with accompanying social communication problems. Each participant was already receiving speech and language services at the school. The data collected for this thesis were part of a larger study, and four of the five students participated in a similar social communication intervention in previous semesters. All of the students involved in the study passed a hearing screening by a school district audiologist or speech language pathologist. A school district psychologist ruled out a diagnosis of intellectual disability and autism spectrum disorder for all of the participants. The children's parents completed a consent form allowing them to participate in the study.

Each participant's language was evaluated at the beginning of the study using the *Clinical Evaluation of Language—Fifth Edition* (CELF-5; Wiig, Semel, & Secord, 2013) to provide a consistent measure of language ability across all of the participants. The participants' teachers and parents both completed the *Children's Communication Checklist-2* (CCC-2; Bishop, 2006), which demonstrated pragmatic difficulties present at home and in the classroom. Each participant's teacher also completed the *Teacher Behavior Rating Scale* (TBRS; Hart & Robinson, 1996), an informal questionnaire used to measure various types of social behavior in

the school context. Teachers rated questionnaire items on a scale of 0-2, where 0 indicted that the behavior rarely occurred and 2 indicated frequent occurrence. Results of these measures are not presented in detail in this thesis, except where relevant to participant description. Each of the five participants is described in more detail in the following section.

K. K was a 12;4 (year; month) year-old Caucasian male who qualified for special education services at the age of 6;2 with a diagnosis of DLD. At the age of 6;6 he received the diagnosis of specific learning disability (SLD) and began receiving special education services in the areas of reading, writing, and math. At the start of the study, K attended a mainstream 6th grade class with on-going resource services. His speech and language services included intervention for articulation and language. K's CCC-2 General Composite Score on both teacher and parent-completed checklists were below the 1st percentile. K's scores on the parent completed CCC-2 revealed that he frequently talked about things that only interested him, misinterpreted instructions, presented with a developmentally immature lexicon, and was frequently left out of activities with peers. K's teacher-completed CCC-2 General Composite Score revealed that K introduced topics that others do not seem to be interested in, had difficulty with figurative language, made syntactical errors, upset other children unintentionally, and did not recognize when others were upset or angry.

K's CELF-5 Composite Language Score fell in the 3rd percentile. K specifically demonstrated areas of low performance in vocabulary, syntax, and repetition tasks. The TBRS also revealed that K struggled in transitioning between tasks, displayed disruptive behavior, exhibited physically aggressive behavior, presented with overly-sensitive emotions, and had

difficulty controlling feelings of excitement. K's teacher specifically noted on the TBRS form that K "talks about his cats all the time."

P. P was a 9;11-year-old Caucasian male with a diagnosis of DLD and a previous diagnosis of attention deficit disorder. A school-based evaluation at age 9;1 resulted in a diagnosis of SLD and qualified P for special education services in the areas of reading and math. P attended a mainstream 6th grade class with pull-out resource services in math and reading. He also received speech-language services with goals focused on articulation, resonance, and language. P's CCC-2 General Composite Score on the parent-completed checklist was in the 1st percentile. Scores on the CCC-2 indicated that P asked questions even when the answer was already given, rarely smiled appropriately when talking to people, and looked expressionless when most children would portray a clear facial expression. P's CCC-2 General Composite Score on teacher-completed checklists was in the 15th percentile. The teacher-reported CCC-2 presented similar findings to the parent-completed questionnaire, specifically indicating that P rarely talked about what others are interested in and had difficulty talking about abstract concepts.

P's CELF-5 Composite Language Score was in the 10th percentile. P performed more poorly in areas of syntax and vocabulary. P's TBRS results revealed that he sometimes stared at other children without interacting with them, built things by himself rather than playing with peers, and preferred to play alone. P's clinician noted that P often talked for long periods of time on topics that did not interest his conversational partner. P struggled to read facial expressions to understand when the listener seemed to be bored or uninterested.

J. J was an 11;9-year-old Caucasian male who qualified for special education services for deficits in speech and language due to deficits in social communication. J's teacher and clinician

noted that J presented little or no facial affect. At the start of the study, J attended a mainstream 6th grade class with continued resource services. His speech and language services included intervention for articulation and language. J's parent-completed CCC-2 General Composite Score fell in the 1st percentile. His score indicated the following: his ability to communicate depended on the setting; he often could not stop talking; and he did not convey clear facial expressions. J's teacher also filled out a CCC-2 form for J; however, J's teacher did not complete each prompt because she reported that she did not know J well enough (the measure was administered at the beginning of the school year). J's teacher-completed CCC-2 General Composite Score was in the 1st percentile and revealed that J's communication skills varied depending on the audience, and he often unintentionally hurt or upset his peers. J's CELF-5 Composite Language Score fell in the 6th percentile with specific deficits in areas of syntax, sentence repetition, and understanding relationships between vocabulary words. The TBRS showed that J did not verbally express feelings, demonstrated restlessness and could not sit still, and wandered aimlessly.

D. D was an 8;4-year-old Caucasian male who received speech and language services due to deficits in syntax and social interaction. D's teacher and parent-completed CCC-2 General Composite Scores fell below the 1st percentile. On the parent-reported CCC-2, D reportedly confused sequences of events, had difficulty remembering vocabulary words, did not talk about abstract concepts, and omitted prefixes and suffixes. Similar findings were described in the teacher-reported CCC-2. D's teacher stated that he was vague in his choice of words, confused pronouns, looked expressionless when most children would convey emotion, and was inattentive. D's CELF-5 Composite Language Score was in the 1st percentile and demonstrated deficits in areas of sentence comprehension, syntax, formulating sentences, and recalling phrases. D's

teacher-completed the TBRS at the beginning of the semester to rate his prosocial behavior and

withdrawal patterns. As reported on the TBRS, D often played alone, was reserved around

peers, and was afraid to approach other children.

W. W was a 6;10-year-old Caucasian male enrolled in a mainstream 1st grade class in

conjunction with pull-out resource services. W received speech and language services for

deficits in syntax, semantics, and pragmatics. W's parent-completed CCC-2 General Composite

Score was below the 1st percentile. The parent-reported CCC-2 showed that W was inattentive,

talked even when asked to stop, and rarely reacted positively to new activities. W's teacher rated

W's communication on the CCC-2; however, she noted that she did not complete every item on

the CCC-2 because she did not know W well enough at the beginning of the school year.

Furthermore, insufficient data resulted in an inability to score the CCC-2 with accuracy. From

the information the teacher provided, W was frequently inattentive and distant. In December of

2016, W's CELF-5 Composite Language Score was in the 8th percentile. W's linguistic

performance seems to be improving; however, the school speech language pathologist

determined that W should remain on the caseload to monitor his linguistic progress. W's

teacher-reported on the TBRS that he was frequently restless and fidgety, had difficulty sitting

still, was disruptively active, and responded angrily to restrictions set by adults. It was also

noted that he took pleasure in the distress of others.

Emotional Inferencing Task

The following task was used before and after intervention to measure the children's ability to

recognize basic emotions and make inferences about which emotion would be experienced given

a particular context. The task examined the ability to infer the emotional state of characters in

stories and was based on the task used by Ford and Milosky (2003) and Spackman, Fujiki, and

Britnon (2006). The stories were presented verbally and had supporting pictures. Each story involved a cartoon character named Chris (a gender-neutral character designed to minimize racial and gender confounding variables). Each depiction of Chris excluded facial expressions. The participants were presented with simple, three-part scenarios such as, "Chris was bouncing a ball. A bully took the ball. Chris was..." The participant would then infer how Chris felt in this situation. Each of six basic emotions (happiness, sadness, anger, fear, disgust, and surprise) were tested five times. The task was one of several administered at the beginning and at the end of intervention.

Intervention Procedures

A social communication intervention was conducted to improve the ability of the children with DLD to infer emotion. The intervention was delivered over the course of 20 sessions occurring twice a week, with each session lasting 20-30 minutes. A student clinician implemented the social communication intervention under the supervision of the school speech language pathologist. Doctorate-level speech language pathologists with an expertise in social communication trained the student clinician to implement the social communication intervention. The doctorate-level speech language pathologists composed scripts for the student clinician as a guideline to follow in intervention. The social communication intervention included six activities: recognizing emotions from pictures of facial expressions, reading a story, an emotion understanding task, story enactment, journaling, and an emotion inferencing task. Story books were carefully selected that included a variety of emotions and a story structure that was easily understood by elementary students. The student clinician used the scripts as a guideline to follow in intervention. The doctorate-level speech language pathologists advised the student clinician to follow the script loosely and to modify it according to the needs of each student.

Step 1: Recognizing emotions from pictures of facial expressions.   Before reading the story, the student clinician presented the participant with a series of pictures of people making facial expressions. The participant had to name the emotion portrayed in the picture of the person making a facial expression. Once the student clinician and the participant started the story, the student clinician would pause and ask, "Which facial expression matches the emotion of this character?" Given that all of the books contained cartoon drawings of characters or animals, attaching pictures of human facial expressions helped the participants associate the emotion with the actual facial expression.

Step 2: Reading the story.   The books included in the intervention were *Llama Llama Red Pajama* by Anna Dewdney*, Knuffle Bunny* by Mo Willems*, Knuffle Bunny Free* by Mo Willems*, The Duckling Gets a Cookie* by Mo Willems*, Pumpkin Trouble* by Jan Thomas*, What Will Fat Cat Sit On?* by Jan Thomas*, Let's Sing a Lullaby with the Brave Cowboy* by Jan Thomas*, Is Everyone Ready for Fun?* by Jan Thomas, *Olive and the Bad Mood* by Tor Freeman*,* and *Olive and the Embarrassing Gift* by Tor Freeman. While looking at the cover of the book, the student clinician and the participant talked about what they guessed the story could be about to activate prior knowledge and hypothesize about content. Depending on the participant's literacy skills, either the student clinician or the participant read the book while talking about the events of the story. The participants were allowed to tell the story on their own as much as possible to encourage language production. Each participant described the events of each page, and the student clinician asked questions that highlighted emotion identification, emotion inferencing, and the cause and effects of emotions. The older and more sophisticated participants focused on perspective taking and hypothetically producing prosocial solutions to problems. For example, the student clinician might ask, "If you were Trixie, what would you

do?" Or "What could you tell Trixie in order to make her feel better?" After reading and discussing the book together, the student clinician asked the participant to quickly summarize the book including the emotions of the characters as discussed.

   Step 3: Emotion understanding task. After the participant summarized the story, the student clinician asked the participant six questions designed to test their understanding of the emotions presented in the story. The student clinician opened the book to the page in which the targeted emotion was expressed. The student clinician pointed to the character and asked, "How does he/she feel?" and "Why does he/she feel _____?" If the participants answered incorrectly, the student clinician corrected them and asked them to state the correct response.

   Step 4: Story enactment. The student clinician and participants used several props to enact the story of each book. The participant chose which character they would like to act out first, and the student clinician assumed the other role. While reenacting the story, the participant was asked to display the character's emotions throughout the story by using the stuffed animals to make gestures and by making facial expressions. After reenacting the story once, the participant and the student clinician switched roles and reenacted it again.

   Step 5: Journaling activity. The participant created a journal in which they recorded some of the emotions highlighted in therapy. Journal entries were focused around the emotions that the characters felt in the story, reasons why the characters felt certain emotions, and instances when the participant has felt that emotion and why. Writing about each emotion in a journal provided an additional modality to solidify principles the participant learned in therapy.

Analysis

   Data were gathered from an emotional inferencing task (Ford & Milosky, 2003; Spackman, Fujiki, &Brinton 2006), which was one of several tasks administered before and after

intervention to measure changes in the ability of children with DLD to make inferences about emotion as a result of the intervention. Each participant's scores for the six emotions were calculated based on their performance on five social scenarios. The participant was asked to infer whether the Chris would feel happy, sad, mad, scared, disgusted, or surprised, given the presented scenario. The task was readministered following the conclusion of the intervention.

Results

Preliminary probes revealed most of the participants had mastered the basic emotions (happy, sad, and mad) before intervention began. These same children, however, had more difficulty with the remaining emotions (fear, disgust, and surprise) and these were generally the emotions tracked in intervention. The participants' results are presented individually in Tables 1-5.

J's Results

Baseline data indicated that J was able to make inferences concerning happy, sad, mad, and surprised before the intervention was initiated, so these emotions were not a focus in intervention. Performance on each of the emotion categories is presented in Table 1. J's score on happy, sad, mad, and surprised remained constant before and after intervention. Some improvement was observed on fear and disgust.

Table 1

J's Scores on the Emotional Inferencing Task Pre- and Post-Intervention

	Baseline	Follow-up
Happy	5/5	5/5
Sad	4/5	5/5
Mad	5/5	5/5
Fear	3/5	5/5
Disgust	0/5	2/5
Surprise	4/5	4/5
Total Raw Score	21/30	26/30
Percent Correct	70%	87%

K's Results

K's results are presented in Table 2. Baseline performance indicated mastery of happy and sad before the intervention began, and performance on these scores remained consistent in the follow-up testing. Performance on the remaining emotions was tracked as follows. K's ability to identify mad and disgust remained consistent, with the same number of errors before and after intervention. K's scores for fear and surprise showed improvement, with fear increasing from 3 to 5 correct and surprise moving from no correct answers in baseline to 4 of 5 in the follow-up data.

Table 2

K's Scores on the Emotional Inferencing Task Pre- and Post-Intervention

	Baseline	Follow-up
Happy	5/5	5/5
Sad	5/5	5/5
Mad	3/5	3/5
Fear	3/5	5/5
Disgust	4/5	4/5
Surprise	0/5	4/5
Total Raw Score	20/30	26/30
Percent Correct	67%	87%

W's Results

W's results are presented in Table 3. Baseline testing indicated that W had mastered happy and mad before the intervention began, and performance in the follow-up testing remained consistent with this observation. W demonstrated moderate decreases in scores for sadness and disgust. W did not produce any correct responses to surprise before or after the intervention.

Table 3

W's Scores on the Emotional Inferencing Task Pre- and Post-Intervention

	Baseline	Follow-up
Happy	5/5	5/5
Sad	4/5	3/5
Mad	5/5	5/5
Fear	3/5	5/5
Disgust	3/5	2/5
Surprise	0/5	0/5
Total Raw Score	22/30	20/30
Percent Correct	73%	67%

D's Results

D's results are presented in Table 4. Baseline indicated that D mastered happy and sad pre intervention and follow-up testing was consistent with these data. Additionally, his ability to infer fear was also high. D demonstrated general improvement across the remaining emotions, with the most notable changes on surprise, and smaller changes on mad and disgust.

Table 4

D's Scores on the Emotional Inferencing Task Pre- and Post-Intervention

	Baseline	Follow-up
Happy	5/5	5/5
Sad	5/5	5/5
Mad	3/5	5/5
Fear	4/5	4/5
Disgust	2/5	3/5
Surprise	1/5	4/5
Total Raw Score	21/30	26/30
Percent Correct	70%	87%

P's Results

P's results are presented in Table 5. Baseline testing indicated that P had mastered happy, sad, fear, and disgust pre intervention. Scores in follow-up were consistent with baseline, although he did make one error on sad when he answered "unhappy." One of P's follow-up errors for mad also involved the answer "unhappy." Although it could be argued that this was a correct response in both cases, it was scored as incorrect due to the vagueness of the response. Based on these answers, his ability to differentiate between sad and mad is unknown, but he did consistently express the correct valence.

Table 5

P's Scores on the Emotional Inferencing Task Pre- and Post-Intervention

	Baseline	Follow-up
Happy	5/5	5/5
Sad	5/5	4/5
Mad	2/5	3/5
Fear	5/5	5/5
Disgust	5/5	5/5
Surprise	4/5	4/5
Total Raw Score	26/30	26/30
Percent Correct	87%	87%

Discussion

Children with DLD demonstrate difficulty in multiple social tasks including entering ongoing interactions (Brinton et al., 1997; Craig & Washington, 1993; Liiva & Cleave, 2005), negotiating with peers (Brinton et al., 1998), and resolving conflicts (Horowitz et al., 2005; Timler, 2008). These difficulties in social interactions are associated with unreciprocated relationships with peers (Durkin & Conti-Ramsden, 2007) and social withdrawal (Fujiki et al., 1999; Fujiki et al., 2004). It is likely the inability to make emotional inferences contributes to these difficulties (Adams et al., 2009; Adams et al., 2012; Ford & Milosky, 2003, 2008; Karasinski & Ellis Weismer, 2010; Vendeveill et al., 2015). Despite the importance of making inferences about emotion, limited research has been conducted on interventions that address emotional inferencing skills of school-age children with DLD (Gerber et al., 2012).

This study evaluated the efficacy of a social communication approach to facilitate the ability to make emotional inferences among children with DLD as measured by an emotional inferencing task (Ford & Milosky, 2003; Spackman, Fujiki, & Brinton, 2006). This task was one of several measures used to assess the participant's emotion inferencing skills before and after the intervention and was the focus of the current study. The participants in the intervention included five children with the diagnosis of DLD, as evidenced by standardized testing and enrollment in intervention for language problems. The emotional inferencing task was administered before and after the delivery of 20 sessions of intervention. Three of the participants produced gains on the emotional inferencing task, with two of those three producing notable changes for specific emotion categories. For the remaining two children, however, performance remained constant or slightly decreased from baseline to follow-up.

The scores for J, K, and D increased on the emotional inferencing task, suggesting that the intervention yielded general improvement in the ability to make inferences about the emotions of the inferencing task. This was not the case for all of the participants, however. W's scores slightly decreased, and P's overall score remained the same. Variation in performance might be expected due to the general heterogeneity seen in children with DLD. Differences in attention, motivation, severity of deficit, and other factors were likely influential in producing the observed variability. Despite these factors, however, there were indications that the children who did make gains on the task produced real growth.

In general, most of the participants had mastered the basic emotions (happy, sad, mad) before intervention began and maintained mastery after intervention. The children's consistent performance on the inferencing task suggested that the results were reliable. On the targeted emotion, performance varied from child to child. Individual children did produce small gains on specific emotions (e.g., a change from two correct in baseline to three correct in follow-up). It is difficult to determine if these changes were the result of intervention or of chance variation. However, in other cases the differences were larger, suggesting that children had learned about the appropriate use of a particular emotion. For example, K did not produce any correct responses to scenarios in which surprise was to be inferred in baseline. In the follow-up, he correctly responded to four of five scenarios. Showing a similar increase, D produced one correct response to surprise in baseline and four correct responses in the follow-up testing. These increases were encouraging.

It was notable how difficult the inferencing task was for these children. All of the participants were in elementary school, ranging in age from 6;9 to 12;3 years in age. Given that typically developing five-year-old children can consistently make inferences about emotions

(Hadwin & Perner, 1991), it was surprising that children with DLD as old as 12 years of age had difficulty with the inferencing task used in this study. Because the children were consistently able to perform the task appropriately for specific emotions (e.g., happy, sad), it seems reasonable to conclude that the task itself was not responsible for these difficulties. The children often demonstrated difficulty with later developing emotions such as surprise.

These data support that children with DLD have difficulties beyond the realm of structural language. Further, they provide one indication that children with DLD can become more proficient at making inferences about emotion through focused intervention.

Limitations of the Study

There are a number of factors that limit the conclusions that can be made about these data. First of all, it should be noted that the reported measure was just one of several baseline and follow-up measures taken. The results of the presently reported task, by itself, are not conclusive. To gain a more comprehensive picture of whether the intervention was effective, additional measures and analyses will have to be considered.

It is also noted performance was variable across the five participants. This variability may have stemmed from factors beyond the impact of the intervention. Each intervention session was designed to focus on the participants' individual needs; therefore, therapy procedures were not completely uniform from session to session. For example, each session included varying amounts of cueing, clinician support, and complexity of instruction. In addition, each of the participants presented with unique social and linguistic deficits insomuch that the intervention might have variably addressed their particular needs, with some children benefiting more than others. These factors may have impacted the performance of the children who made minimal gains.

Additional factors such as attention, age, maturity, motivation, and previous experience could have also impacted performance. Additionally, each session was scheduled to last about 20 minutes, but the duration of each session varied as the intervention was conducted in a real school context and factors to the treatment sometimes impacted the session length.

Additionally, while the inferencing task was designed to measure emotional inferencing ability, it is not a comprehensive or representative assessment of emotional inferencing performance in day-to-day social interactions. Finally, the small sample size (N = 5), limited the generalizability of the observed results. It will be necessary to consider more participants in order to make statements concerning whether these results are generalizable to other children.

Directions for Future Research

Although the probes from the emotional inferencing task did not reveal consistent gains from all participants, there were some promising outcomes. In the future, it is hoped that a larger sample of participants might be studied using a more structured design to allow comments about causation. Additionally, more intense intervention would be beneficial. Using a true single subject design over a longer period of time would make it possible to more fully explore the benefits of the intervention. Such a design was not possible in the current study because of the limitations of fitting intervention to the child's already established treatment schedule.

In a future study, it is also recommended that additional means of measuring the children's ability to make inferences about emotion be taken and simultaneously reported. A more comprehensive assessment of emotional abilities would also be beneficial (narrative comprehension, language expression, reading, and making facial expressions, etc.). The current study specifically measured changes in emotional inferencing; perhaps a more comprehensive look at overall improvement in language and emotion understanding could be of value to

determine efficacy of the intervention. In addition, comparing the methods of this social communication intervention with alternative methods that focus primarily on emotional inferencing may be of value to determine the means of improving emotional inferencing.

Summary

The participants' responses to the intervention provided encouraging evidence that a social communication approach to intervention may improve emotional inferencing skills in children with DLD. Most of the participants demonstrated improvement in emotional inferencing while others slightly decreased or remained constant; however, future research should be conducted to further understand the variation in performance among participants. Limitations of the study include variability among participants' social skills and variation of the administration of the intervention. Future studies should include a larger sample size, a control group, a variety of ways to measure emotional inferencing, and an increased emphasis on emotional inferencing during intervention.

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APPENDIX A: Annotated Bibliography

Adams, C., Clarke, E., & Haynes, R. (2009). Inference and sentence comprehension in children with specific or pragmatic language impairments. *International Journal of Language and Communication Disorders, 44*(3), 301-318, doi:10.1080/13682820802051788

Purpose of the Study: To investigate the ability of children with language impairment and a group of typically developing children to make verbal inferences compared to their ability to complete a sentence comprehension task.

Methods: Sixty-four children with language impairment participated in the study. The children were divided into two groups: children with specific language impairment (CwSLI) and children with pragmatic language impairment (CwPLI). Each participant completed an inference comprehension task and a sentence comprehension task. The error types made during the inference task were analyzed.

Results: CwLI had lower raw scores than typically developing children on the inference task. CwPLI had lower raw scores on the inference task than CwSLI. CwPLI scored lower on the inference task than the sentence comprehension-matched control participants.

Conclusions: CwPLI struggle to make inferences more than CwSLI; however the results also indicate a high overlap between both groups. Sentence comprehension ability predicted performance on the inferencing task.

Relevance to Current Work: Children with language impairment have difficulty making inferences in general. Further, children with language impairment who specifically possess deficits in pragmatics struggle even more than the general group of CwSLI to make inferences.

Adams, C. & Lloyd J. (2007). The effects of speech and language therapy intervention on children with pragmatic language impairments in mainstream school. *British Journal of Special Education, 34*(4), 226-233, doi:10.1111/j.1467-08578.2007.004483.x

Purpose of the Study: To determine if pragmatic speech and language intervention improved the social communication of children with pragmatic language impairment.

Methods: Six children with pragmatic language impairment attending mainstream schools underwent a program of speech and language intervention consisting of twenty sessions that targeted pragmatic language, including conversation skills, narrative comprehension, and making inferences. Children qualified for the study if they scored low enough on the Children's Communication Checklist (CCC), did not present with a diagnosis of ASD according to the Autism Diagnostic Interview (ADI), and had a clinical diagnosis of PLI. The intervention targeted establishing positive interactions in the classroom, understanding social and emotional language, minimizing rigidity, comprehending social inferences and figurative language, improving turn-taking, managing and maintaining a topic, building sequences, and identifying cohesion and coherence in narratives.

Results: Each participant showed significant improvement in developing conversation skills, specifically in topic maintenance, turn-taking, and avoiding tangential speech. Participants demonstrated a more equal distribution of turns in conversation post-therapy. Some children showed improvements in language scores post-intervention. However, it is unclear if improvements in general language were a result of the language therapy or natural language development.

Conclusions: Speech and language therapy yielded positive effects in pragmatic functioning, specifically in conversational skills.

Relevance to Current Work: Children with pragmatic language impairment benefit from speech and language intervention that targets conversation skills, narrative comprehension, and making inferences.

Adams, C., Lockton, E., Gaile, J., Earl, G., & Freed, J. (2012). Implementation of a manualized communication intervention for school-aged children with pragmatic and social communication needs in a randomized controlled trial: The social communication intervention project. *International Journal of Language and Communication Disorders, 47*(3), 245-256. doi:10.1111/j.1460-6984.2012.00147.x

Purpose of the Study: To test the effectiveness of a social communication intervention for children with social pragmatic impairments, including children with language impairment and Autism Spectrum Disorder (ASD).

Methods: A group of 88 children with pragmatic deficits between the ages of five and ten participated in the study. Some of the participants engaged in social communication intervention outlined in an intervention manual. Progress was measured by gauging structural language complexity, narrative development, parent-reported social communication skills, and teacher-reported pragmatic rating scales.

Results: The social communication intervention implemented did not yield significant results in areas of language structure or narrative development. However, significant improvements were noted in areas of conversational competence, parent-reported social communication skills, and teacher-reported pragmatic rating scales.

Conclusions: Although the participants did not make significant gains on standardized language assessments of structure (compared to the controls, who were enrolled in traditional intervention), the subjects did improve in parent/teacher-reported measures. Social communication intervention may have significant effects on participants according to parent and teacher reported measures even if structural gains (beyond the performance of the control group, who also received traditional intervention) were not evident in standardized language assessments.

Relevance to Current Work: The implementation of social communication intervention may not yield significant gains in standardized language assessments of language structure beyond children enrolled in traditional intervention. However, significant improvements were observed in parent and teacher reported measures of conversation and other pragmatic behaviors.

Bakopoulou, I., & Dockrell, J.E. (2016). The role of social cognition and prosocial behaviour in relation to the socio-emotional functioning of primary aged children with specific language impairment. *Research in Developmental Disabilities, 49-50,* 354-370. doi:10.1016/j.ridd.2015.12.013

Purpose of the Study: To investigate the relationship between language impairment and socio-emotional functioning using teachers' ratings of social cognition skills of children with LI.

Methods: Forty-two children with SLI and 42 of their age-matched peers participated in the study. Each of the participants were assessed in four areas of social cognition using the Strengths and Difficulties questionnaire (SDQ) (emotion identification, emotion labeling, inferring the causes of emotions, and knowledge of conflict resolution strategies) completed by the children's teachers.

Results: The children with SLI demonstrated lower level functioning on all four socio-emotional tasks than their age-matched peers as rated by their teachers. Findings revealed that performance on social cognition tasks was predictive of teachers' ratings on socio-emotional functioning. Results also suggest that deficits in areas of expressive and receptive language are not associated with poor socio-emotional functioning.

Conclusion: Social cognition and prosocial behavior are areas of weakness in children with SLI.

Relevance to Current Work: This study provides evidence for the deficits of social cognition among children with language impairment. It also suggests that future studies should be conducted to find what additional factors could attribute to their deficits in social cognition.

Bishop, D. V. M., Chan, J., Adams, C., Hartley, J., & Weir, F. (2000). Conversational responsiveness in specific language impairment: Evidence of disproportionate pragmatic difficulties in a subset of children. *Development and Psychopathology, 12*(2), 177-199.

Purpose of the Study: To determine if the conversational responsiveness of children with specific language impairment (SLI) matched that of their age-matched peers.

Methods: Three groups of children participated in the study: Eighteen children with SLI ranging from ages 6-8 years old, nine typically developing children of the same chronological age, and nine younger children with the same linguistic level of the children with SLI. Furthermore, half of the group with SLI presented with pragmatic language impairment (PLI) while the other half primarily presented with typical deficits in expressive and receptive language (SLI-T). Each participant was exposed to an adult's soliciting utterances, and the participants' responses were recorded.

Results: Each group responded to the conversational solicitations; however, the children in the group with PLI were less likely to give a response. Children in the PLI group also did not use very effective nonverbal responses.

Conclusions: A subset of children with language impairment present with social communication deficits specific to conversational responsiveness.

Relevance to Current Work: Children with SLI often do not just present with expressive and receptive language deficits; they also face social communication problems, specifically in conversational responsiveness.

Botting, N., & Conti-Ramdsen, G. (1999). Pragmatic impairment without autism. *Autism, 3*(4), 371-396. doi:10.1177/1362361399003004005

Purpose of the Study: To analyze the similarities and differences between children who have pragmatic language impairment and children who have typical specific language impairment (SLI).

Methods: Ten children with SLI who also have social communication deficits were labeled as having pragmatic language impairment for the purpose of this study. Each of the ten children scored below average on teacher and parent-reported scores of the Children's Communication Checklist (CCC). The participants' behavior was compared to the behavior of children presenting with typical SLI. The participants' behavior was examined to determine if they fit the current description of existing autistic spectrum disorder.

Results: The children with pragmatic language impairment all acquired their first words before the children with typical SLI. However, the children with pragmatic language impairment presented with stereotyped language, difficulty in showing empathy, and interpreting contextual clues. Based on the CCC scores, the children with pragmatic language impairment did not score significantly lower than the typical SLI group.

Conclusion: Some children may not fit in either the SLI or autism spectrum disorder category. Children with pragmatic language impairment were often thought to have intact expressive and receptive language; however, this study shows that most of the children with PLI also present with linguistic deficits.

Relevance to Current Work: A subset of children with language impairment also face problems with social communication specifically in showing empathy and understanding context.

Boucher, J., Lewis, V., & Collis, G. M. (2000). Voice processing abilities in children with autism, children with specific language impairments, and young typically developing children. *Journal of Child Psychology & Psychiatry, 41*(7), 847-857.

Purpose of the Study: To investigate the association between voice processing abilities among children with autism children with specific language impairment (SLI), and typically-developing children.

Methods: Four experiments were conducted. In the first, second, and third experiments, children with SLI with similar linguistic abilities were used as a control group. In the fourth experiment, mainstream children were the controls. Each experiment included identifying familiar sounds to objects, familiar voice recognition, unfamiliar voice discrimination, and labeling the emotions conveyed in unfamiliar voices.

Results: Children with autism performed similarly to the children in the control groups on experiments one, two, and three. Both children with autism and children with SLI received lower scores compared to their age matched peers on identifying emotions presented via vocal stimuli.

Conclusions: Both children on the autism spectrum and children with SLI present with impairments in interpreting socioemotional information conveyed through prosody.

Relevance to Current Work: Children with SLI had difficulty interpreting socioemotional stimuli presented by way of vocal prosody.

Brinton, B., & Fujiki, M. (2005). Social competence in children with language impairment: Making connections. *Seminars in Speech and Language, 26*(3), 151-159. doi:10.1055/s-2005-91712

Purpose of the Study: The purpose of this article is to discuss the complex nature of the connection between language deficits and social competence, consider factors that influence the social outcomes of children with language impairment (LI), and demonstrate how to facilitate the development of language and social competence in children with LI through effective intervention.

Methods: The case studies of Joseph, and adolescent with LI, and Cari, a 6-year-old identified with Asperger syndrome, were used to demonstrate the complexity of the relationship between LI and social competence as well as the importance of implementing an intervention that facilitates social functioning. Moreover, the authors explored factors that affect the relationship between language and social competence. Some of these factors include the extent and nature of the LI, emotion regulation, emotion understanding, social inferencing, and behaviors that inhibit effective social interactions.

Results: It was suggested that poor social competence and poor language skills, such as those experienced by Joseph and Cari, often result in negative social outcomes. These negative outcomes limit a child's opportunity for learning, establishing quality relationships, and their overall functioning. Thus, it is important to not only target language skills in children with LI, but also cognitive, social, and emotional areas across various contexts.

Conclusions: The authors concluded that traditional academic and language goals need to be coupled with goals focused on improving social communications in order to help children with LI establish and maintain relationships, learn more effectively, and fully improve their quality of life.

Relevance to Current Work: This article highlighted the complexity of the relationship between LI and social deficits and the importance of interventions that target both language and social skills.

Brinton, B., Fujiki, M., & McKee, L. (1998). The negotiation skills of children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 41*(4)*, 927-940.

Purpose of the Study: To examine the ability of children with language impairment to negotiate in interactions with two age-matched peers.

Methods: Six children with language impairment and twelve typically developing age-matched peers participated in the study. Each child was placed in a triad: a target child with language impairment and two typically developing children. Similar triads of three typically developing children were also observed. In one group, the target child was age-matched to the child with language impairment. In a second group, the target child was language-matched to the target child with language impairment. Each triad participated in a negotiation sequence, and the sequences were analyzed using Selman's interpersonal negotiation strategies (INS) model. The triads were asked to negotiate by selecting a treat that would be split between all three children. The negotiation skills of the children with language impairment were compared to that of their age-matched peers.

Results: Children with language impairment produced the same amount of utterances as their age-matched peers. However, these children utilized negotiation strategies less frequently than the other children in their triads. Children with language impairment also used less complex negotiation strategies than the children in their triads, and they were often excluded from the final decision. Similar patterns were not observed in the triads with language-matched or age-matched peers.

Conclusions: Children with language impairment are less skilled than typically developing children in using developmentally appropriate negotiation skills.

Relevance to Current Work: Children with language impairment present with areas of deficit in social communication that are not exclusive to emotional intelligence.

Brinton, B., Fujiki, M., & Powell, J. M. (1997). The ability of children with language impairment to manipulate topic in a structured task. *Language, Speech, and Hearing Services in Schools, 28*(1), 3-11.

Purpose of the Study: To discover if children with specific language impairment (SLI) can manipulate the topic of conversation as well as their typically developing age-matched peers.

Methods: Three groups of children participated in the study including ten children with SLI, ten typically developing children of the same chronological age, and ten children with similar language skills. Each child engaged in a conversation in which two types of topics were introduced. One topic involved an object, and the other topic introduced an event. Three examples of each were introduced into the interaction.

Results: Most participants produced appropriate responses; however, the children with SLI produced more socially inappropriate responses compared to the children in the other groups. Children with SLI talked less about the event topics compared to the object topics.

Conclusions: Children with SLI sometimes struggle to manipulate the topic, particularly when abstract topics were introduced. These children were less likely to contribute an appropriate response to a verbal topic than either their age-matched peers or language-matched peers.

Relevance to Current Work: Language impairment does not affect expressive and receptive language alone; children with SLI also present with problems in social communication, particularly topic maintenance.

Brinton, B., Fujiki, M., Spencer, J. C., & Robinson, L. A. (1997). The ability of children with specific language impairment to access and participate in an ongoing interaction. *Journal of Speech, Language, and Hearing Research, 40*(5)*,* 1011-1025.

Purpose of the Study: To investigate the ability of children with specific language impairment (SLI) to join and contribute to an ongoing conversation.

Methods: Six children with language impairment between the ages of 8-12 years participated in the study along with six age-matched peers and six language-matched peers. These children were labeled the target children, and were observed attempting to accessing a dyadic interaction, involving two typical children that they had not previous met. The time it took each participant to enter the ongoing interaction and the amount of involvement in the interaction were measured.

Results: Two of the children in the group with SLI did not access the interaction. It took significantly more time for the children with SLI to join the interaction. The children with SLI who accessed the interaction talked significantly less than their age matched peers. All of the children in the two typical groups accessed the on-going interaction successfully. Target children in the two typical groups did not interact differently from the other children in their triads.

Conclusions: Children with SLI have greater difficulty joining ongoing conversations than their age-matched peers. These deficits can decrease the number of interactions children with SLI participate in and reduce the opportunity to improve social skills.

Relevance to Current Work: Deficits observed in children with SLI are not limited to language; however, language impairment often affects areas of social communication as well.

Brinton, B., Spackman, M. P., Fujiki, M., & Ricks, J. (2007). What should Chris say? The ability of children with specific language impairment to recognize the need to dissemble emotions in social situations. *Journal of Speech, Language, and Hearing Research, 50*, 798-811.

Purpose of the Study: To investigate the ability of children with specific language impairment (SLI) and their age-matched peers to determine when an emotion should be dissembled (hidden) for social purposes (e.g., hiding disappointment when receiving a substandard gift).

Methods: Nineteen children with SLI and 19 of their typically developing age-matched peers participated in the study. Each participant was presented with social scenarios involving a character named Chris. In these scenarios, Chris would experience an emotion that should be dissembled to be socially appropriate, and the participants were asked which emotion Chris was

feeling, and what he/she should do in response to the emotion experienced (display or dissemble it).

Results: Children with SLI answered that they would display rather than dissemble an emotion significantly more often than their typically developing age-matched peers.

Conclusions: Children with SLI do not dissemble emotions appropriately in social situations as often as their typical peers.

Relevance to Current Work: Deficits in emotion dissemblance among children with SLI may have negative social consequences such as offending others. The inability to anticipate how the listener may feel is highly connected to inferring emotions. A social communication intervention that targets emotional inferencing could possibly resolve deficits in dissembling emotions.

Clegg, J., Hollis, C., Mawhood, L., & Rutter, M. (2005). Developmental language disorders—A follow-up in later adult life. Cognitive, language and psychosocial outcomes. *Journal of Child Psychology & Psychiatry*, *46*(2), 128–149.

Purpose of the Study: Individuals with receptive and expressive language disorders tend to have persisting problems in childhood, adolescence, and even adulthood. Research shows that children with persisting language disorders experience difficulty in areas of phonological processing, literacy, academic achievement, and understanding inferences. Individuals with developmental language disorders (DLD) are likely to develop social, behavioral, emotional, and psychiatric problems in childhood.

Method: Seventeen male adults with severe receptive language impairment in childhood were assessed in early childhood, middle childhood, and early adult life. Members of this group had 16 siblings who did not have any language disorders. These 16 siblings were compared to the 17 adults with the history of DLD. The 17 males with a history of DLD were then compared to 17 typically developing males. Finally, there was a general population comparison group that was identified using the National Child Development Study (NCDS). Each subject was assessed for cognitive skills, language skills, social skills, and intelligence and literacy measures. In addition, participants were assessed for theory of mind skills.

Results: The men with DLD showed severe and persisting language disorders and severe literacy impairments. The subjects with DLD in childhood had impaired language skills, including cognitive skills, theory of mind skills, spelling skills, and phonological processing skills. Those children with DLD who had higher levels of childhood intelligence and language had better language and cognitive abilities as adults. Individuals with DLD had poorer social skills in adulthood compared to the groups without DLD.

Relevance to the current work: This study shows that children with LI have social and language problems that persist into adulthood. These findings underscore the importance of language intervention for these children.

Conti-Ramsden, G. & Botting, N. (2004). Social difficulties and victimization in children with SLI at 11 years of age. *Journal of Speech, Language, and Hearing Research, 47*(1), 145-161, doi:1092-4388/04/4701-0145

Purpose of the Study: To follow-up on the social difficulties and patterns of victimization in children involved in a previous study.

Methods: Two hundred forty-two children with specific language impairment (SLI), age seven, participated in the original study. The same group of children participated in this study, now at age 11 years. Each participant completed the Rutter behavioral questionnaire, the Strengths and Difficulties questionnaire, the "My Life in School" Questionnaire, the Children's Communication Checklist (CCC), a general cognitive assessment, the Wechsler Objective Reading Dimensions, informal language tests, and the Peer Competence subscale of the Harter Perceived Competence Scale.

Results: Test results from the above listed assessments demonstrated that children with language impairment presented with poor social competence. Also, 36% of the participants were at risk of being victimized by their peers compared to 12% of typically developing children.

Conclusions: Children with SLI are at risk for victimization. Social communication difficulties were most associated with poor social skills and impaired language related to victimization according to results from the Children's Communication Checklist (CCC).

Relevance to Current Work: Children with language impairment are more at risk for victimization due to poor social competence and language deficits.

Craig-Unkefer, L. A., & Kaiser, A. P. (2001). Improving the social communication skills of at-risk preschool children in a play context. *Topics in Early Childhood Special Education,22*(1), 3-13. doi:10.1177/027112140202200101

Purpose of the Study: To test an intervention method designed to improve social communication among preschool children. The therapy implemented in the study targeted areas of pragmatics, verbal engagement, and play development. The participants in the study were specifically instructed in how to plan their play, to utilize communication strategies in interactions, and to self-evaluate play.

Method: Six children, each combined in dyads between the ages of 3;5-3;11 participated. Each participant demonstrated disordered linguistic skills on the PLS-3, and exhibited aggressive, anxious, depressive, or rebellious behaviors based on the *Child Behavior Checklist.* The intervention included three major components: planning the play, engaging in play, and self-evaluating play. While planning the play session, the clinician introduced the setting, roles, expectations, and possible means of interaction. During play, the clinician cued and prompted the participants as needed. During the self-evaluation component of the session, the clinician and the participants reviewed the events during play and identified what they could do better next time. Each session was recorded, transcribed, and analyzed.

Results: Implementation of the intervention resulted in an increase in social communication behaviors, the use of descriptive and request utterances, and linguistic complexity and diversity, and play complexity.

Conclusion: Giving direct instruction on how to play increased linguistic complexity and diversity and improved interaction and engagement during play. Teaching preschool children strategies to communicate increased the quantity and quality of interactions during play.

Relevance to Current Work: This study demonstrated the importance of incorporating social communication intervention to language intervention, particularly in children who have deficits in the area of pragmatics and social communication.

Durkin, K., & Conti-Ramsden, G. (2007). Language, social behavior, and the quality of friendships in adolescents with and without a history of specific language impairment. *Child Development, 78*(5), 1441-1457. doi:10.1111/j.1467-8624.2007.01076.x

Purpose of the Study: Friendship is one of the essential components of child development, and children with language impairment (LI) are less likely to make meaningful relationships with peers. Making and maintaining friends involves language-dependent tasks such as engaging, initiating interactions, topic-maintenance, perspective taking, and conversational reciprocity. Children with LI usually perform poorly in areas of social communication, particularly in cognitive and emotional regulation, social withdrawal, and prosocial behavior. Due to these limitations, children with LI tend to be less accepted by their peers.

Methods: A group of 120 adolescents with SLI between the ages of 15 and 16 years old and 118 of their age-matched peers participated in the study. Subtests of the CELF-R, subtests of the British Ability Scales, the Bus Story Test, and the Ravens Coloured Matrices, were administered to the participants of the study to demonstrate the linguistic gap between the group of adolescents with LI and the group of typically developing adolescents. Participants self-reported their performance regarding social-emotional functioning using the Strengths and Difficulties Questionnaire (SDQ). To measure the quality of friendships, each participant engaged in a Social-Emotional Functioning Interview. The interviewer asked standardized questions regarding whom the participant talked to and how much they socialized. A portion of the interview was given to the parents of the participants to gauge the participants' quality of friendships.

Results: Participants with SLI demonstrated significantly lower scores in the number and quality of friendships in which they were involved than their age-matched peers.

Conclusions: Longitudinal analyses show that delays in developmental language are associated with poorer quality of friendship in adolescence.

Relevance to Current Work: This study revealed that individuals with language impairment have an increased risk of having low-quality friendships in adolescence. Although social problems are not always present in children with language impairment, when individuals present with social-emotional deficits, they are less-likely to develop quality friendships and peer acceptance.

Ford, J.A., & Milosky, L. A. (2003). Inferring emotional reactions in social situations: Differences in children with language impairment, *Journal of Speech, Language, and Hearing Research, 46*(1)*,* 21-30. doi:10.1044/1092-4388(2003/002)

Purpose: The purpose of this study was to discover the capacity of kindergarten children with LI and their typically developing peers to infer the emotional reactions of characters from story presentations.

Method: A total of 24 kindergarten children, 12 with LI and 12 of their chronically aged matched peers participated. During the study, children with LI and the typically developing children labeled and identified pictures of facial expressions that depicted one of four emotions (happy, sad, surprised, and mad). The participants were presented with a three-sentence story in one of three modalities: verbal, visual, or a combination of verbal and visual. The children selected one of the four pictures of facial expressions to match the emotions of the characters in the three-sentence scenarios.

Results: Both groups could accurately identify emotions depicted in pictures of facial expressions. However, children with LI performed significantly poorer than their peers when inferring emotions in relation to the stories presented. These children were also more likely to make valence errors, such as happy for angry, when the emotion was labeled inaccurately.

Conclusion: The researchers concluded that children with LI have difficulty inferring what emotion would be experienced in a simple story in comparison to their age matched peers. Children with LI struggle to integrate emotion understanding into social inferencing contexts that include emotions.

Relevance to Current Work: This study provides evidence that children with LI have difficulty with making inferences about emotions. Children with LI more commonly confuse the valence of emotions compared to their age-matched peers.

Ford, J. A., & Milosky, L. A. (2008). Inference generation during discourse and its relation to social competence: An online investigation of abilities of children with and without language impairment. *Journal of Speech, Language, and Hearing Research, 51*(1)*,* 367-380. doi:1092-4388/08/5102-036754

Purpose of the Study: To determine if children with language impairment differ from their typically developing peers in making emotion inferences during the process of discourse comprehension. This study also examined the factors that affect the ability to make inferences about emotion and investigated the relationship of these factors to social competence.

Methods: A group of typically developing preschool children and a group of preschool children with LI watched narrated videos designed to highlight emotions (happy, sad, afraid). After each video, the participants were presented a facial expression and were asked to name the emotion. Sometimes, the facial expression matched the emotion in the story, but sometimes, it did not match the anticipated emotion from the story. The participants were presented with filler

stories as well to minimize unwanted priming of emotion words. A total of seven tasks were presented to each child, including a vocal response time measure, inferencing task, receptive language measure, nonverbal cognitive measure, confrontational naming measure, drawing task, and an a source of emotion task. The primary teacher of each child completed a questionnaire measuring social competence.

Results: The response time of the typically developing children was longer when the facial expression did not match the emotion from the video. However, the response time of the children with LI remained constant—whether the facial expression matched the video or not. This indicated that the typically developing children made inferences during comprehension of discourse while children with LI did not make emotional inferences. Results indicated that word knowledge (emotion situation knowledge and confrontational naming), language skills, vocal response time measures, and social competence were linked to emotion inferencing ability. However, drawing of facial expressions did not correlate with inferencing ability. Results also showed that drawing facial expressions and making emotional inferences was significantly related to social competence.

Conclusions: Children with typically developing language make inferences in real time during the process of discourse comprehension while children with LI struggle to make those inferences.

Relevance to Current Work: This study demonstrated that children with LI often experience deficits making emotion inferences in real time during discourse.

Fujiki, M., Brinton, B., Morgan, M., & Hart, C. H. (1999). Withdrawn and sociable behavior of children with language impairment. *Language, Speech, and Hearing Services in Schools, 30*(1), 183-195. doi: 10.1044/0161-1461.3002.183

Purpose of the Study: To investigate the subtypes of withdrawal and sociability among children with language impairment and their typically-developing age matched peers.

Methods: Forty-one children with language impairment (LI) and 41 of their typically-developing age matched peers participated in the study. The participants' teachers completed the *Teacher Behavior Rating Scale* (TBRS) which measures withdrawn behavior. The questions on the rating scale were categorized into three subtypes of withdrawal: solitary-passive withdrawal, solitary-active withdrawal, and reticence. Additionally, two subtypes of social behavior were analyzed: impulse control/likability and prosocial behavior.

Results: Children with LI received TBRS scores that reflected higher levels of reticence compared to their typically developing age matched peers. Additionally, male participants with LI were more likely to present with solitary-active withdrawal than girls with LI and typically developing children. According to the teachers' responses, children with LI demonstrated fewer sociable behaviors than their typically developing age-matched peers.

Conclusions: An association exists between LI and withdrawal; however, given the results, it cannot be concluded that LI is the main contributor to social communication problems.

Relevance to Current Work: Children with LI present with more withdrawn behaviors than typically developing children. Additionally, the TBRS is a reliable and valid measure of

withdrawal in children with language impairment. Teachers have historically been resources to determine children's general behavior and behavioral problems. Teachers' observations are often more objective than that of the students' peers. The TBRS is a reliable and valid instrument designed to measure withdrawal and sociability.

Fujiki, M., Spackman, M. P., Brinton, B., & Hall, A. (2004). The relationship of language and emotion regulation skills to reticence in children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 47*(3), 647-662.

Purpose of the Study: To investigate the association between emotion regulation, language, and reticence in children with specific language impairment (SLI) and their age-matched peers.

Methods: Forty-three children with SLI and 43 typically developing children participated in the study. The Emotion Regulation Checklist (ERS) and the *Teacher Behavior Rating Scale* (TBRS), which measures reticence, were completed by each participant's teacher. The Comprehensive Assessment of Spoken Language (CASL) was also administered to measure linguistic ability. Each of these scores was collected to conduct a regression analysis to determine the association between both measures.

Results: The scores from the ERS, which measured emotion regulation, and the CASL, which measured language, were direct predictors of the child's level of reticence.

Conclusion: Language and emotion regulation are important predictors of reticent behavior in children with SLI.

Relevance to Current Work: Children with SLI have difficulty with emotion regulation, which, according to this study, is a predictor of social difficulty. The current study examines the ability of an intervention to address an additional aspect of emotion understanding, the ability to making inferences about emotion.

Fujiki, M., Spackman, M. P., Brinton, B., & Illig, T. (2008). The ability of children with language impairment to understand emotion conveyed by prosody in a narrative passage. *International Journal of Language and Communication Disorders, 43*(3), 330-345. doi:10.1080/13682820701507377

Purpose of the Study: To investigate the ability of children with language impairment to employ emotion understanding skills to interpret prosody in a narrative passage.

Methods: Thirty-eight children between the ages of eight to ten participated in the study. Half of the children had language impairment and half of the children were typically developing. Each participant listened to a seven-sentence narrative read by actors to express specific emotions including happy, mad, sad, and scared. The participants then identified which emotion the voice conveyed.

Results: Children with language impairment did not identify the emotions as accurately as their age-matched peers. Identifying happy was the easiest task while fear was the most difficult.

Conclusions: Children with language impairment have deficits in areas beyond expressive and receptive language. Language impairment also affects areas of social communication and emotion understanding.

Relevance to Current Work: Children with language impairment present deficits in areas of emotion understanding, specifically in identifying emotions based on the prosodic contour of an individual's voice.

Gerber, S., Brice, A., Capone, N., Fujiki, M., & Timler, G. (2012). Language use in social interactions of school-age children with language impairments: An evidence-based systematic review of treatment. *Language, Speech, and Hearing Services in Schools, 43*(2), 235. doi:10.1044/0161-1461(2011/10-0047)

Purpose of Study: To evaluate the available literature regarding the efficacy of pragmatic-based treatment among school-age children with language impairment.

Methods: ASHA created an ad hoc committee, which developed an evidence-based systematic review of treatment for language use in school-age children with language impairment.

Results: The evidence-based systematic review of treatment methods offered preliminary support of multiple treatment techniques targeting social communication behaviors. Progress was reported in topic management, narrative skills, and conversational repair.

Conclusion: Further investigation of each treatment procedure is needed before making an observational recommendation for the most evidence-based treatment to be applied in clinical practice.

Relevance to Current Work: There is a high demand for studies examining the efficacy of social communication intervention for school age children with language impairment.

Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B. and Youngstrom, E., 2001, Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science*, *12*(1), 18–23.

Purpose of the Study: To evaluate the relationship between emotion knowledge and positive and negative social behavior and academic achievement in children from low socioeconomic status environments.

Methods: A longitudinal study was conducted in which 105 children at age five and 72 children at both ages five and nine participated. These participants were selected from families of low socioeconomic status. The participants' ability to recognize and name emotions conveyed in facial expressions was measured, collected, and evaluated in an index. The emotion

recognition task required the participant to match the facial expression to the emotion that the examiner described. The parents of the participants completed a Behavioral Styles Questionnaire to measure social behavior and temperament. Additionally, the participants' academic history was collected and examined.

Results: As the participants' emotion knowledge improved, their verbal ability in an academic setting improved as well. Linguistic skill and temperament predicted later social behavior.

Conclusions: The capacity to recognize and label emotions encourages positive social interactions. With increased emotion knowledge, children present more positive social skills, particularly in making appropriate assertions and cooperating with peers.

Relevance to Current Work: The ability to recognize and name emotions precedes the ability to engage in positive social interactions.

Karasinski, C. & Ellis Weismer, S. (2010). Comprehension of inferences in discourse processing by adolescents with and without language impairment. *Journal of Speech, Language, and Hearing Research, 53*(5), 1268-1279, doi:10.1044/1092-4388(2009/09-0006)

Purpose of the Study: To investigate the ability of children to make inferences in spoken narratives with various language and cognitive skills.

Methods: Four groups of children participated in the study, including a normal language group, a low cognitive group, a group with specific language impairment (SLI), and group with non-specific language impairment. The subjects from all four groups added up to 527 participants. The participants listened to a recording of a story. The examiner asked four questions about the premise of the story and four inferencing questions. Two of the inferencing questions were adjacent questions, meaning they asked about the material presented right before the question was asked. Two of the inferencing questions were distant questions, meaning that it required the participant to recall the information presented previously.

Results: For all groups, distant inferencing questions were the hardest to answer correctly. The normal language group performed significantly better than the other groups on making distant inferences. The low cognitive group performed significantly better than the non-specific language impairment group on making distant inferences. If the accuracy of the premise questions were controlled, children with SLI performed significantly worse than children with normal language and cognition.

Conclusions: Comprehending implied information in audio-recorded stories, specifically when connecting distant information, is particularly difficult for children with deficits in receptive language, working memory, and general cognition.

Relevance to Current Work: Children with language impairment have difficulty understanding inferences in discourse.

Lucas, R. & Norbury, C. F. (2015). Making inferences from text: It's vocabulary that matters. *Journal of Speech, Language, and Hearing Research, 58*(4), 1224-1232, doi:10.1044/2015_jslhr-1-14-0330

Purpose of the Study: To investigate the association between reading comprehension deficits and text-inferencing skills among children with language impairment, children with ASD, and typical children.

Methods: Four groups of children participated in the study: typically developing children, children with ASD with age-appropriate language levels, children with ASD with impaired language, and children with specific language impairment. Each participant completed the Neale Analysis of Reading Ability—Revised, which included questions that test reading comprehension and inferencing skills. Responses to each question were analyzed.

Results: Oral language skill predicted the ability to make inferences. Fifty percent of children with language impairment presented deficits in making inferences from the text regardless of a diagnosis of ASD. Additionally, one-third of the participants with typical language levels presented deficits in making inferences.

Conclusions: Children with language impairments secondary to ASD or due to specific language impairment have difficulty making inferences while reading.

Relevance to Current Work: Linguistic capability is associated with the ability to make inferences in children with SLI and ASD. Lucas and Norbury suggest implementing vocabulary interventions to improve specific inferencing skills.

Spackman, M. P., Fujiki, M., & Brinton, B. (2006). Understanding emotions in context: The effects of language impairment on children's ability to infer emotional reactions. *International Journal of Language and Communication Disorders, 41*(2)*,* 173-188. doi:10.1080/13682820500224091

Purpose of the Study: The purpose of this study was to discover the capability of children with language impairment (LI) to make emotion inferences in response to specific social situations.

Method: A group of 43 children with LI and a control group of 43 typically developing children were presented with short scenarios designed to elicit emotions (anger, fear, happiness, or sadness). The short scenarios featured a fictional character named Chris. The children were asked to name the emotion Chris experienced after the scenario was presented. They were also asked to discuss the emotion that they named. For example, they were asked, "Why does Chris feel (emotion)?" and "How does it feel inside to be (emotion)?" (p. 179).

Results: Both groups most accurately identified emotions in the following order: happiness, sadness, fear, and then anger. Identifying fear and anger was the most difficult for both groups. The older children in the groups were found to be more accurate in identifying emotions than the younger children. Likewise, the control group was more accurate than the

group with LI in identifying emotions. Children with LI were much less expressive in describing how the emotions feel.

Conclusion: This study revealed that children with LI were significantly less accurate and less sophisticated in making emotional inferences compared to their typically developing peers. The difficulty that children with LI have with inferring emotions based on situational context may affect their ability to engage in successful social interactions.

Relevance to Current Work: This article provided evidence that children with LI experience deficits in emotional inferencing, which is a key factor in successful social interactions. Furthermore, a key focus of the current thesis was facilitating emotion inferencing in children with LI.

Spackman, M. P., Fujiki, M., Brinton, B., Nelson, D., & Allen, J. (2006). The ability of children with language impairment to recognize emotion conveyed by facial expression and music. *Communication Disorders Quarterly, 26*(3)*,* 131-143.

Purpose of the Study: To examine the emotion understanding independent of linguistic skill of children with language impairment and their age-matched peers.

Methods: Forty-three children with language impairment between the ages of five and 12 years old and 43 of their typically developing age-matched peers participated in the study. The participants were presented with pictures of facial expressions, and each participant was asked to state what emotion was being expressed in the picture. Participants also listened to pieces of classical music and were asked to describe which emotion the music conveyed. These tasks were specifically designed to isolate the ability to code emotions without dependence on linguistic skill.

Results: Children with language impairment identified the emotions of happy, sad, scared, and mad as accurately as their age-matched peers. However, the children with language impairment scored significantly lower than their age-matched peers in identifying emotions of disgust and surprise. Significant differences were observed between the age groups as well. Younger children answered more poorly than the older group on tasks involving anger and surprise.

Conclusions: Children with language impairment have difficulty identifying and read emotions conveyed in facial expressions and music compared to typical peers.

Relevance to Current Work: Children with language impairment struggle to identify emotions even on tasks that are not dependent on linguistic skill.

Stansbury, K. & Zimmermann, L. K. (1999). Relations among child language skills, maternal socialization of emotion regulation, and child behavior problems. *Child Psychology and Human Development, 30*(2), 121-142, doi:10.1023/A:1021954402840

Purpose of the Study: Children with language impairment often face behavioral problems. Stansbury and Zimmermann hypothesized that behavioral problems associated with

language impairment were related to their inability to express their emotions through words, regulate emotions, and effectively express their emotions.

Methods: A total of 78 pairs of preschool-age children and their mothers participated in the study. Each dyad was introduced to two frustrating circumstances, and their responses to each situation were recorded and analyzed for demonstrating emotion regulation strategies and exhibiting behavioral problems using the Child Behavior Checklist (CBCL).

Results: Children with language impairment showed more behavioral problems on the CBCL than typically developing children. Children with low language comprehension find difficulty resolving frustrating situations and regulating emotions. Preschool children with language impairment were more likely to exhibit behavioral problems than their typically developing children. Mothers who utilized an authoritarian approach used shorter utterances with their children, which elicited fewer verbal attempts from the children. Low language levels in children also affected the strategies that the mothers chose to implement. Children with higher levels of expressive language were more likely to communicate distress to their mothers, and the mothers were able to offer emotion regulation strategies. Children with low expressive language levels often resorted to behavioral issues to communicate their emotions, which lead into a longer negative emotional episode.

Conclusions: The results supported the original hypothesis that children with language deficits or delays find difficulty in regulating emotions, which triggers behavioral problems.

Relevance to Current Work: Children with language impairment have difficulty expressing their emotions, which impacts their ability to regulate their emotions. Additionally, difficulty in regulating emotions also leads to behavioral problems.

Stanton-Chapman, T.L., Denning, C. B., & Jamison, K. R. (2010). Communication skill building in young children with and without disabilities in a preschool classroom. *The Journal of Special Education, 46*(2), 78-93. doi:10.1177/0022466910378044

Purpose of Study: To determine the effects of a social communication intervention on the turn-taking skills of typically-developing pre-school children and pre-school children with disabilities.

Methods: Eight children were paired into dyads in a multiple baseline design. Each participant engaged in dramatic play themes using the "plan-do-review" format.

Results: All participants demonstrated an increase in the number of conversational initiations. Additionally, social communication gains were maintained over time; however, generalization to a classroom setting was not yet established.

Conclusion: Social communication intervention methods increase conversational initiation and participate in socially communicative behavior.

Relevance to Current Work: Direct instruction of turn-taking skills is likely to improve social communication skills of children with language impairment.

Stanton-Chapman, T.L., Jamison, K. R., & Denning, C. B. (2008). Building social communication skills in young children with disabilities: an intervention to promote peer social interactions in preschool settings. *Early Childhood Services, 2*(4), 225-251.

Purpose of Study: To determine if multi-faceted social communication therapy techniques improve language learning and social communication in preschool children with disabilities.

Methods: Eight children with developmental disabilities participated in an intervention protocol consisting of a planning and instructing period, a play period to apply social skills, and a review period to reflect on performance.

Results: Seven of the eight participants yielded better social pragmatic skills and increased positive vocalizations.

Conclusion: Multifaceted intervention targeting social communication, cognition, and language was effective in all of the targeted areas.

Relevance to Current Work: Social communication skills and verbalizations are necessary for positive peer interactions and linguistic improvement. The current study presents a social communication intervention.

Stanton-Chapman, T.L., & Snell, M. E. (2011). Promoting turn-taking skills in preschool children with disabilities: The effects of a peer-based social communication intervention. *Early Childhood Research Quarterly, 26*(3), 303-319. doi:10.1016/j.ecresq.2010.11.002

Purpose of Study: To evaluate the effects of a social communication intervention on the turn-taking skills of preschool children with disabilities.

Methods: Ten participants of five dyads participated in a multiple baseline design implementing an intervention targeting social communication. The intervention specifically targeted turn-taking, initiation, and peer interaction.

Results: Improvement in social communication was observed in six of the ten participants. Nine of the ten participants demonstrated generalized peer interaction, increased levels of initiation in interactions, and decreased levels of solitary pretend play post-intervention.

Conclusion: Improved social interactions result from social communication intervention amongst some children with disabilities. Intensive intervention may produce increased turn-taking skills of children with language impairment.

Relevance to Current Work: Multicomponent intervention methods involving social, language, and cognitive goals can improve social communication skills in general and turn-taking skills in some children with disabilities.

Timler, G. R. (2008). Social knowledge in children with language impairments: Examination of strategies, predicted consequences, and goals in peer conflict situations. *Clinical Linguistics & Phonetics, 22*(9), 741-763.

Purpose of the Study: To investigate the social understanding of school-age children with language impairment and their typically developing peers.

Methods: Twelve theoretical peer conflict tasks were presented to the participants in the study. The participants' prosocial responses during the conflict and the results from the *Social Skills Rating System* (Teacher and Parent versions) were recorded.

Results: The children with language impairment selected fewer prosocial responses than their typically developing age-matched peers. Both children with language impairment and typically developing children selected more self-interested strategies rather than relationship-conscientious strategies. For children with language impairment, the *Clinical Evaluation of Language Fundamentals—Fourth Edition* (CELF-4) scores completed by the participants' teachers corresponded with the participants' selection of prosocial behavior in the study.

Conclusions: Children with language impairment selected fewer prosocial responses than their age-matched peers, which made them less effective in resolving conflicts. The amount of prosocial responses made by the children with language impairment corresponds with the CELF-4 scores, so teacher-reported measures can yield an accurate measure of child's behavior.

Relevance to Current Work: Children with language impairment struggle to utilize prosocial responses to resolve conflicts with typically developing peers.

Vendeville, N., Blanc, N., & Brechet, C. (2015). A drawing task to assess emotion inference in language-impaired children. *Journal of Speech, Language, and Hearing Research, 58*(5), 1563, doi:10.1044/2015_jslhr-1-14-0343

Purpose of the Study: To evaluate the capacity of children with language impairment to infer emotions in a drawing task, which does not rely on verbal linguistic responses.

Methods: Twenty-two children with language impairment and 22 typically developing children between the ages of six and ten-years-old listened to audio stories. Periodically, the examiner stopped the audio recording and asked the participants to draw a face conveying the emotion felt by the character of the story. Three adults, who were not given any information regarding of the purpose of the study, objectively evaluated the drawings.

Results: Children with language impairment had a difficult time inferring emotions compared to the typically developing children. Children with language impairment made more valence errors (mistaking a positive emotion for a negative emotion or vice versa) than the typically developing children.

Conclusions: Children with language impairment demonstrate difficulty in inferring emotions, even in a task that does not require linguistic expression.

Relevance to Current Work: Children with language impairment present with deficits in inferring emotions. These deficits are not a result of their impairment of expressive language. This study provides evidence that children with language impairment struggle to interpret and infer emotions independent from their linguistic deficits.

APPENDIX B: Emotional Inferencing Score Sheet

Recognition of Emotional State of Characters in Stories.

Examiner: **I am going to tell you a story. Then, I'm going to ask you some questions. Listen carefully.**

Christ gets two big lollipops. Chris decides to share. He gives one lollipop to his brother Bob.

Question 1: **What did Chris have?**
Question 2: **What did Chris do with the lollipop?**
If the child isn't successful, repeat these directions while pointing at the pictures. If the child still isn't successful, ask, "Did Chris have a lollipop? Did Chris give the lollipop to Bob?"

Examiner: **Good. Now I am going to tell you some more stories about Chris. I want you to tell me how Chris feels.**

1. (happy) Chris wants a teddy bear for his birthday. Chris opens a present. It is a big fluffy teddy bear. Chris feels _____.

2. (mad) Chris is bouncing a ball. Another kid comes and takes the ball away. Chris feels _____.

3. (fear) Chris is working in school. A big kid walks up to Chris. Chris thinks the kid is mean. Chris feels _____.

4. (sad) Chris is reading a book with Grandma. Chris likes to read with Grandma. Grandma has to go home. Chris feels _____.

5. (disgust) Chris likes a clean bathroom. Chris goes into the bathroom No one has flushed the toilet. Chris feels _____.

6. (sad) Chris is eating pizza. He takes a slice. He spills sauce on his new shirt. Chris feels _____.

7. (mad) Chris thinks hats are stupid. His mother says that he has to wear a hat to school today. Chris feels _____.

8. (fear) Chris is playing alone in the basement. Suddenly all the lights go off. Chris feels _____.

9. (surprise) Chris wants cereal for breakfast. Chris gets the cereal box. Chris opens the box. It is full of marbles. Chris feels _____.

10. (disgust) Chris picks up a glove. He puts his hand in the glove. There is sticky black stuff in the glove. Chris gets the black stuff on his hand. Chris feels _____.

11. (happy) Chris likes to color. He enters a coloring contest. Chris wins an award for the best picture. Chris feels _____.

12. (sad) Chris gets a new goldfish. Chris likes to watch the goldfish. The goldfish dies. Chris feels _____.

13. (happy) Chris is playing piano for the class at school. Chris does a good job. Everyone claps when he is finished. Chris feels _____.

14. (mad) Chris is carrying a bucket of black paint. Chris trips. The paint spills all over his foot. Chris feels _____.

15. (fear) Chris is walking. Chris is on a mountain path. Chris thinks he might fall. Chris feels _____.

16. (surprise) Chris' mom has long black hair. Chris comes home from school. Mom has short orange hair. Chris feels _____.

17. (disgust) Chris is eating lunch. Chris is eating salad. Chris finds a fly in the salad. Chris feels _____.

18. (surprise) Chris is going to school. Chris sees a dog. Chris gives the dog a treat. The dog says, "quack quack." Chris feels _____.

19. (happy) Chris loves balloons. A man gives him a red balloon. Chris feels _____.

20. (mad) Chris is sleeping. His sister puts a lollipop in his hair. Chris wakes up with the lollipop stuck in his hair. Chris feels _____.

21. (disgust) Chris is walking. He/she steps in dog poop. It is very stinky. Chris feels _____.

22. (fear) Chris is at the store with his/her mom. Chris is looking at the vegetables. Suddenly, he/she cannot see Mom anywhere. Chris feels _____.

23. (sad) Chris really likes playing with his friend Jan. One day, Jan's family moves away. Chris feels _____.

24. (surprise) Chris is looking at his cat. Suddenly, the cat sees a bird. The cat unfolds wings and starts to fly after the bird. Chris feels _____.

25. (fear) Chris is playing in the yard. Suddenly, a big dog comes along. Chris feels _____.

26. (surprise) Chris is looking for his glove He/she looks under his/her bed. Chris sees a chicken on a nest. Chris feels _____.

27. (sad) Chris is playing with his/her friend Lynn. They are having fun. Lynn's Mom comes. Lynn has to go home. Chris feels _____.

28. (mad) Chris is drinking pop. Another kid bumps Chris. The pop spills all over Chris. Chris feels _____.

29. (happy) Chris works very hard on a picture for Grandpa. Grandpa loves the picture. Chris feels _____.

30. (disgusting) Chris loves pink lemonade. He/she goes out to recess and leaves the lemonade on the table. He comes back. He finds ants all over the lemonade. Chris feels _____.

APPENDIX C: Parental Permission Form

Introduction: I am Professor Martin Fujiki, Brigham Young University. I am doing research to develop therapy procedures to help children with communication problems improve their social interactional skills. Your child is being invited to participate because he/she is currently receiving speech language services in _____ School District at _____ Elementary School.

Procedures: I am asking you to enroll your child in a 12 to 14-week intervention study. During this time your child will be enrolled in intervention that will focus on teaching social communication skills. The goal will be to help your child interact more appropriately with peers and adults. Therapy will be provided by a combination of BYU graduate students in Communication Disorders and your child's school clinician. All treatment will take place at your child's school. There will be two to three treatment sessions per week, each lasting about 30 minutes. All treatment sessions will be video recorded. These sessions will work on helping the child to understand better the emotional responses of others. All treatment sessions will take place during the regular school day. In addition, your child may be given additional testing to make sure that he/she meets the study criteria. Some of this testing is likely to already have been done but if it no it may take an additional two hours of time to complete. If the testing has already been done, we would like to request your permission for the school clinician to make this information available to us. All treatment sessions will be video recorded to allow researchers to analyze the effectiveness of the treatment. The recordings will be erased following completion of the analyses.

As part of the assessment and follow-up I will be asking you to complete a paper copy of a social skills questionnaire for your child before and after the intervention takes place.

Risks/Discomforts: There are minimal risks associated with this treatment. You child may miss class for one extra session of therapy a week during the course of the study. Your child's school clinician will either be present or close by during all therapy sessions to handle any questions or difficulties that may arise as a result of working in the treatment conditions. Clinicians and supervisors will consult regularly to make sure that your child is not experiencing any problems in the treatment conditions. The only other discomfort is that the questionnaire I will ask you to complete will take about 20 minutes of your time.

Benefits: The primary benefit to your child is the potential growth resulting from receiving intensive intervention during the course of the study. There are benefits to society in general in that this study may result in more effective treatment methods for children with social communication problems.

Compensation: There is no compensation associated with participation in the study.

Confidentiality: Your child's participation will be confidential. All materials will be stored in locked cabinets in locked labs at BYU. Names will be removed from research materials and neither your name nor your child's name will ever be used in connection with any presentation of this research. Video images will be stored on a secure hard drive in a locked lab at BYU. These images will be used to document how well your child responses to the intervention. These images will be stored for two years to allow analysis and then destroyed.

Participation: Participation is voluntary. If you give permission to include your child in the study, he/she will also be asked if he/she would like to participate. Even if you give consent, you and your child have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your class status, grade or standing with the school.

Questions about the Research: If you have any questions concerning the study, please contact me. My phone number and email address are (801) 422-5994, martin_fujiki@byu.edu.

Questions about your Rights as a Research Participant

If you have questions regarding your rights as a research participant, you may contact the BYU IRB Administrator, A-285 ASB, Brigham Young University, Provo, UT 84602, 801-422-1461, irb@byu.edu.

I have read, understand, and received a copy of the above consent and of my own free will allow my child _____to participate in the study.

Signature_____ Date_____

Printed name_____

Video Release Form

As noted above, I will be making video recording of your child during participation in the research. Please indicate what uses of these video tapes you are willing to permit, by putting your initial next to the uses you agree to and signing the form at the end.

1. _____The videotapes can be studied by the research team for use in the research project.

2. _____Short excerpts from the videotapes can be shown at scientific conferences or

        meetings.

3. _____Short excerpts from the videotapes can be shown in university classes.

I have read the above descriptions and give my consent for the use of the videotapes as indicated by my initials above.

_____   _____

(Signature)   (Date)

Name_____