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The Efficacy of Social Communication Intervention in Improving
Emotion Inferencing for School-aged Children with
Language Impairment

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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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ABSTRACT

The Efficacy of Social Communication Intervention in Improving Emotion Inferencing for School-aged Children with Language Impairment

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Children with language impairment (LI) have demonstrated several language problems, including receptive and expressive deficits. A growing body of research has further demonstrated emotion understanding and, more specifically, emotion inferencing deficits that negatively affect the ability of this population to use language successfully in social interactions. Consequently, the present study examines social communication intervention focused on improving emotion inferencing for children with a diagnosis of LI or Autism Spectrum Disorder (ASD), as similar social communication deficits are occasionally seen in children with these diagnoses. Study participants were identified from the caseload of a practicing certified speech-language pathologist (SLP) and qualified for intervention based upon Comprehensive Assessment of Spoken Language (CASL) and Universal Nonverbal Intelligence Test (UNIT) scores. Participant ability to perform an emotion inferencing task was then compared pre- and post-treatment with descriptive statistics and presented as 6 individual case studies to determine the effectiveness of social communication intervention. Results are presented pre- and post-intervention and indicated that emotion inferencing capacities for a given scenario increased for some participants, while others demonstrated either modest gains or slight declines in performance after intervention.

Keywords: social communication, social skills, emotion understanding, emotion inferencing.

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DESCRIPTION OF STRUCTURE AND CONTENT

This thesis is presented in a hybrid format where current journal publication formatting is blended with traditional thesis requirements. The introductory pages are therefore a reflection of the most up-to-date university requirements while the thesis report reflects current length and style standards for research published in peer-reviewed journals for communication disorders. Appendix A is composed of an annotated bibliography. Appendix B includes a sample lesson plan. Appendix C provides a sample inference chart.

Introduction

Traditionally, children with language impairment (LI) are thought to have receptive and expressive deficits in the face of otherwise typical development. These deficits have included difficulties understanding and producing appropriate syntax, morphology, and vocabulary words (Owens, 2004). Recent research has demonstrated that these children also experience difficulty with aspects of social competence. These deficits are particularly evident for social behaviors that rely upon language for successful interaction. For example, there has been significant research documenting the conversational problems of children with LI (Adams & Lloyd, 2005; Bishop, Chan, Adams, Hartly, & Weir, 2000; Brinton, Fujiki, & Powell, 1997; Brinton, Fujiki, Loeb, & Winkler, 1986; Brinton, Fujiki, & Sonnenberg, 1988; Fujiki & Brinton, 1991; Merrison & Merrison, 2005). By way of illustration, Adams and Lloyd (2005) found that children with LI had difficulty deciphering the informational needs of their conversational partners. As a result, these children made conversational contributions that often seemed nonresponsive to their conversational partners. Children with LI also required more questions, clarifications, and recapitulations than their typically developing peers to understand the dynamics of conversation.

Several other researchers have found that children with LI have difficulties performing specific social tasks (Brinton, Fujiki, & Higbee, 1998; Brinton, Fujiki, Spencer, & Robinson, 1997; Craig & Washington, 1993; Horowitz, Jansson, Ljungberg, & Hendbro, 2005; Liiva & Cleave, 2005; Timler, 2008). One particular social behavior that has been repeatedly highlighted is access, or the ability to enter an ongoing social interaction. In these studies, children with LI have been consistently found to have difficulty entering the ongoing play activities of typically developing children. In these same studies, typically developing children varied in the speeds at

which they accessed dyadic interactions; however, none ultimately failed to enter the interaction in question (Brinton et al., 1997; Craig & Washington, 1993; Liiva & Cleave, 2005).

There has been considerable speculation as to the source of the social interactional deficits of children with LI. These problems are frequently attributed to difficulty with language structure (Redmond & Rice, 1998). There can be little doubt that the linguistic deficits in children with LI play a role in the social problems that they typically experience. Yet there is evidence that structural abilities do not fully explain the social interactional problems of children with LI. For example, Hart, Fujiki, Brinton, and Hart (2004) found that the severity of a child's deficits impacted perceptions of their sociable behavior. Significantly, this was not the case for reticent withdrawal. Children with severe deficits were not necessarily more withdrawn than children with milder language problems, indicating that factors other than language may also negatively influence social outcomes in children with LI.

In attempting to identify factors that may interact with language problems during social interactions, several researchers have considered the potential influence of emotional competence. This focus is reasonable because social and emotional competencies are closely related. Children who have difficulty understanding, regulating, and expressing emotions are likely to also experience problems in social interactions (Denham, 1998). Within the general domain of emotional competence, several investigations have examined the specific area of emotion understanding.

Emotion understanding is defined as the capacity to recognize and interpret one's own emotions as well as the emotions of others (Harris, 2008). Several recent studies have found that children with LI have significantly poorer emotion understanding capacities than their typically developing peers. For example, children with language deficits have demonstrated greater

difficulties than typical children when identifying emotions on faces (Holder & Kirkpatrick, 1991; Spackman, Fujiki, Brinton, Nelson, & Allen, 2006) and from prosody (Creusere, Alt, & Plante, 2003; Berk, Doehring, & Bryans, 1983; Courtright & Courtright, 1983; Fujiki, Spackman, Brinton, & Illig, 2008; Trauner, Ballantyne, Chase, & Tallal, 1993). These findings indicate that understanding emotion is difficult for children with LI, even when reduced to its most fundamental levels.

Of particular interest to the current investigation are the deficits demonstrated by children with LI within a certain type of emotion understanding—the capacity to make inferences as to the type of emotions that would likely be elicited by a particular scenario. In fact, Ford and Milosky (2008) have posited that response times to emotion naming tasks indicated that children with LI did not make emotion inferences during discourse contexts. Conversely, they found that the response times of typically developing children indicated that they were making inferences about emotions during the comprehension process. Earlier work by the same pair of researchers (Ford & Milosky, 2003) suggested that, even though children with LI can label emotions, they had difficulty making inferences about the emotions a person might experience, given even relatively simple scenarios (e.g., Chris loves balloons. Christ gets a balloon. Chris is _____). To elaborate, participants were asked to label verbally pictures of emotional expressions as an assessment of production. Using the same pictures, study participants were asked to point to emotions named by the examiner as an assessment of comprehension. Study participants then listened to stories randomly presented in visual, verbal, or a combination of visual and verbal modalities and were asked to identify how the protagonist felt (happy, surprised, mad, or sad) as an assessment of emotion inferencing capacities. Children with LI appeared unable to consistently associate the correct specific emotions that would be experienced by common

scenarios. At times these children made valence errors, confusing negative and positive emotions.

Importantly, Ford and Milosky's work was replicated with older children (Spackman, Fujiki, & Brinton, 2006). Children in the Spackman et al. study were presented with a story scenario for each target emotion and then asked to supply both a reason for the protagonist's emotions and a description of the emotion named. In this study, the emotion of fear was added to the target emotions presented earlier by Ford and Milosky. To further reduce short-term memory and language demands associated with the task, participants were permitted to point to cards that visually represented the target emotions. The results of this study again suggested that children with LI were less accurate than their typically developing peers in inferring the emotions an individual might experience in relatively common situations.

Ultimately, it seems reasonable to conclude that such limited capacities for understanding and inferencing emotions affect the ability of children with LI to respond to the dynamic demands of social interaction, particularly with peers (Spackman et al., 2006). It is also reasonable to assume that improved ability to make appropriate inferences regarding the emotions that others experience would result in improved social interactions. To address this need, an intervention based on telling and retelling narrative vignettes was designed to target emotion understanding abilities in children with social communication problems. The research question addressed in the current study was to determine the efficacy of an intervention program based on the telling and retelling of narrative vignettes for children with LI using an inferencing task similar to those used by Ford and Milosky (2003) and Spackman et al. (2006).

Method

Design

The current study focuses on one aspect of a larger research project examining the efficacy of a social communication intervention designed to improve the emotion understanding of children with LI. For the current study, six children were examined using a single case study approach. In this approach, a baseline measure was administered, followed by a block of intervention activities, and completed with a follow-up measure identical to the one utilized to gather baseline data. The baseline and follow-up measure that examined emotional inferencing was the focus of the current study.

Independent Variable. The independent variable in this study was the intervention program administered by the clinician. The individual components of the intervention are described below and include the Mercer Mayer wordless picture books, hand mirror, inference charts, participant journals, and Mind Reading software.

Dependent Variable. The dependent variable was the participant performance in inferencing emotions as measured on both the baseline and follow-up procedures. These data were reported below as mean frequencies for correct responses.

Participants

Six children (age range = 5;1-6;10 [years;months]) were identified for the study from a pool of children already receiving services from a certified speech-language pathologist (SLP) at an elementary school in the western United States. Ongoing intervention provided by the SLP focused on syntactic, semantic, and pragmatic goals. Participants were further qualified based upon a Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999) composite score that was at least 1 *SD* below the mean in combination with an IQ scores of 80 or

above on the Universal Test of Nonverbal Intelligence (Bracken & McCallum, 1998). Social communication deficits were documented by poor performance on the Children's Communication Checklist-2 (Bishop, 2003).

Children with LI and children with ASD were included as study participants as a reflection of the typical client populations currently found in most speech-language pathologist school-aged caseloads. None of the participants receiving the intervention program was considered to be of low socioeconomic status. Although some participants received services from a certified speech-language pathologist for speech or language difficulties in addition to social communication intervention (e.g., speech intelligibility), these issues were deemed to be minor and of secondary importance to the social communication intervention needs that were critical for all participants at the time of the study.

In order to preserve child confidentiality throughout baseline, intervention, and follow-up tasks, participants were randomly assigned a number and pseudonym to represent their identities. This number and pseudonym, along with basic assessment and demographic data for all participants, are presented in Table 1. Standardized test result scores for all participants are then presented in Table 2.

Table 1

Participant Demographic Information

Participant Number	Participant Pseudonym	Participant Gender	Participant Age	School Grade	Diagnostic Category
1	Ed	M	5;3	K	ASD
2	Bob	M	6;10	1	LI
3	Maria	F	5;8	K	LI
4	Mark	M	5;10	K	LI
5	Brandon	M	5;1	K	ASD
6	Tyler	M	5;3	K	LI

Note. M = Male; F = Female; Participant Age = year;month; K = Kindergarten.

Table 2*Study Participant Standardized Test Scores*

Participant Number	CASL Core	CASL Antonyms	CASL Syntax Construction	CASL Paragraph Comp.	CASL Pragmatic Judgment	UNIT Full Scale IQ	CCC-2 GCC	CCC-2 SIDC
1	78	91	67	94	76	101	36	17
2	69	76	74	80	65	88	50	14
3	77	91	89	64	78	83	40	17
4	75	82	79	78	81	88	38	8
5	64	71	67	70	68	108	33	12
6	80	88	92	60	96	91	46	6

Note. CASL = Comprehensive Assessment of Spoken Language; UNIT = Universal Nonverbal Intelligence Test; CCC-2 = Children's Communication Checklist-2; GCC = General Communication Composite; SIDC = Social Interaction Deviance Composite.

Participant 1: Ed. This child was a 5;3 year-old Caucasian male presenting with Autism Spectrum Disorder (ASD). This diagnosis was based upon administration of the Autistic Diagnostic and Observation Scale—Module 1 when the child was 2 years of age. Administration of the Children's Communication Checklist-2 (Bishop, 2003) further confirmed difficulty with pragmatic behavior. Low subtest scaled scores on this measure included 2 for speech ($M = 3.67$; $SD = 1.49$), 0 for syntax ($M = 2.00$; $SD = 1.83$), 5 for semantics ($M = 5.50$; $SD = 1.38$), 4 for coherence ($M = 4.50$; $SD = 1.50$), 6 for inappropriate initiation ($M = 7.50$; $SD = 1.12$), 4 for use of context ($M = 4.67$; $SD = 0.47$), and 6 for social ($M = 5.67$; $SD = 1.25$). Ed was previously enrolled in a preschool for children with ASD before his current placement in a small group kindergarten for children with ASD. Ed was also receiving Occupational Therapy (OT) and Adapted Physical Education (APE) services at the time of the study. Deficits in the areas of social skills and emotion regulation were identified as the major barriers to this individual's participation in mainstream education. Initial placement in speech and language services was

undertaken to address unintelligible speech and multiple phonological processes. Although speech and language goals at the time of the study were designed to address articulation and vocabulary difficulties, these difficulties were not considered to be severe or the main focus of needed intervention. Social communication deficits were deemed the most important clinical targets at the time of the study.

Participant 2: Bob. This child was a 6;10 year-old Caucasian male presenting with language characteristics consistent with LI. This diagnosis was made in the South Central United States just prior to his third birthday. Bob received services from a special needs preschool prior to participation in planned study intervention activities and was enrolled in a mainstream first grade class at the time of the study itself. Dysphagia and dysarthria were diagnosed previous to study activities, and Bob continued to receive intervention for these issues during intervention. Initially, he received speech and language services to address articulation deficits, although language issues eventually received greater attention with a focus on difficulties with sequencing, past tense –ed, and pronouns.

Participant 3: Maria. This child was a 5;8 year-old Caucasian female initially diagnosed with Developmental Delay. This diagnosis was made through a school district assessment center when Maria was three or four years of age. In the opinion of her SLP, her diagnosis was LI. This assessment was based on low results from the Preschool Language Scale-4 (PLS-4) and near typical scores on the UNIT. While Maria was initially enrolled in a special needs preschool, she eventually did not require or qualify for the full resources of that placement. She was part of a mainstream kindergarten class receiving 60 minutes of resource services each day along with APE and OT services at the time of study. Other services Maria received at the time of the study included enrollment in a special reading class with goals to identify upper and

lower case letters, high frequency sight words, and rhyming words. She was also enrolled in a special math course tasked with working on patterns along with identifying, counting, and writing numbers. Speech and language services at the time of the study included answering narrative comprehension questions, retelling narratives, and increasing general vocabulary words.

Participant 4: Mark. This child was a 5;10 year-old Caucasian male initially diagnosed with Developmental Delay. This diagnosis was made just prior to his 3rd birthday through an assessment center for the school. As with Maria, a diagnosis of LI was suggested by performance on the PLS-4 and UNIT. Mark was also initially enrolled in a special needs preschool, though at the time of study intervention he was participating in a mainstream kindergarten class and keeping pace academically with his peers. Mark received OT services to address fine motor difficulties during the study timeframe. Initial assessment after his 3rd birthday determined that he spoke using mostly vowels and gestures, though there was receptive language capacity for some nouns and verbs. These assessment efforts also revealed a lack of interaction with peers even though he appeared to enjoy the company of others. Speech and language services at the time of the study focused on ongoing phonological issues and language difficulties.

Participant 5: Brandon. Brandon was a 5;1 year-old Caucasian male diagnosed with ASD. This diagnosis was made by a physician when the participant was 4 years of age. At the time of study, Brandon was enrolled in a small group kindergarten with other children demonstrating similar difficulties; prior to this placement, he was enrolled in a preschool for children with ASD. Brandon's academic performance was not on grade level at the time of the study, although cognitive capacities were within typical limits and short-term memory

difficulties had been previously documented. He was also receiving APE and OT services during the time that the intervention was being conducted. Speech and language goals included answering yes/no and wh-questions, reducing reliance on jargon, combining words to make full sentences during communication, correct pronoun usage, and adequate requesting attempts.

Participant 6: Tyler. Tyler was a 5;3 year-old African American male diagnosed with LI. This diagnosis was made through a school district assessment center when the participant was 4 years of age using the PLS-4 and other measures, such as the Vineland Adaptive Behavior Scales-II. Tyler was previously enrolled in a special needs preschool for low academic performance; however, he was placed in a mainstream kindergarten at the time of the study. Tyler's academic performance suggested difficulties in several areas and increased time with resource services was consequently under consideration at the time of the study. Speech and language difficulties included an overreliance on general vocabulary and rote social communication scripts in conversational interaction. Speech and language services focused on addressing receptive and expressive vocabulary deficits, answering questions, and assessing competence for basic concepts such as spatial references.

Baseline and Follow-up Procedures

The baseline and follow-up tasks were based on procedures used by Ford and Milosky (2003, 2008) and Spackman et al. (2006). A series of vignettes with supporting color drawings were presented to the study participants. Each of these vignettes featured the same protagonist. Ford and Milosky's original work referred to the protagonist creature as Twinky. Spackman et al. (2006) used Ford and Milosky's drawings, but renamed the creature Chris. Spackman et al. also added several vignettes. In each vignette Chris participated in a situation in which it was likely that he would experience a particular emotion. For example, in one vignette Chris fell

asleep and another child, Bob, put a lollipop in his hair. When Chris awakens and tries to remove it, the lollipop only becomes more entangled. Each vignette was designed to elicit certain emotions from the protagonist such as fear, happiness, anger, or sadness. As fear was not one of the original emotions investigated by Ford and Milosky, vignettes in which the protagonist would be likely to experience fear were added by Spackman et al. (2006). These vignettes with colored drawings were subsequently presented to study participants using a 3-ring binder in the current study. Each emotion was assessed three times during each baseline and follow-up administration using the same inferencing task in keeping with a single case study approach.

The examiner initiated the inferencing task by indicating that a story would be read. The child was asked to listen carefully in order to answer questions about a story. Two practice questions were then administered. If the child was unsuccessful in answering these questions, the directions were repeated as the examiner pointed to a model picture; if the child was still unsuccessful, direct yes/no questions were asked to elicit the correct responses. Study participants were then asked to indicate which emotion the protagonist would experience for each of the vignettes. For example, one vignette read “Chris sees a man selling balloons on the street. Chris loves balloons. The man gives Chris a bright red balloon. Chris feels _____.” There were two supporting drawings, the first showing Chris holding a coin and approaching the man with balloons and the second showing Chris receiving the red balloon from the man. The emotion to be identified for this vignette was happiness. Each emotion was tested 3 times and 16 vignettes were included in each administration of this task aside from the vignette associated with the practice questions. Two testing forms were utilized to vary the order of administration for the vignettes.

In addition to the vignettes, an ambiguous set of items were utilized to elicit emotions from the study participants (e.g., a child who does not like animals receives a puppy as indicated through illustrations of the scenario). Other items included a camera that did not work, which the clinician claimed to have received as a birthday present, and black modeling clay that the clinician said was found on the ground. The data collected from these ambiguous items were not analyzed for the purposes of the current study.

Intervention Procedures and Materials

Intervention was based on a series of lesson plans developed before study activities were initiated with participants. These lesson plans and associated materials constituted an intervention package designed to address the emotion inferencing deficits of study participants. Lesson plan objectives were followed in the order they were designed with the pace of intervention ultimately dictated by the productivity and progression of the participants. Lesson plans were also based upon the narratives described below and therefore followed their development. Each study participant received 20 sessions of intervention lasting 20 minutes each.

The intervention focused on presenting emotion inferencing opportunities to the participants primarily through story tasks. In this context, prompting tasks were included to increase participant exposure to inferencing opportunities and provide an ongoing context in which inferences about emotions could be made. The following materials and tasks were included in intervention.

Mercer Mayer wordless picture books. Children were provided opportunities to infer emotion through clinician telling and participant retelling of three of Mercer Mayer's wordless illustrated *Boy, Dog, Frog* series of books. Emotion inferencing opportunities were based upon

events occurring in the stories. In this approach, participants were asked about what emotions characters were experiencing and what motivated these emotions. For example, the clinician prompted participants to infer emotions from both facial expressions of emotion and the narrative context. The target emotion was then explicitly labeled by either the participant or the clinician if the child could not arrive at an accurate inference (the clinician might indicate that a smiling mouth and “smiling” eyes indicates a happy face). With the labeling of the target emotion, facial cues that facilitated the correct inference were then explicitly discussed. Questions that examined story context as an influence on emotions were then attempted. In this approach, participants were encouraged to speculate as to why characters might experience specific emotions during different events. This process was repeated for the series of narratives as the child progressed through intervention.

In addition to telling and retelling the stories, two other supplemental features of intervention aimed at improving emotion inferencing included the use of a hand mirror and inference charts. While these features were approached overtly during intervention, they were designed and executed as secondary to the work done with stories.

Hand mirror. A hand mirror was used to provide study participants feedback on what emotions appeared like when expressed through their own reflected facial features. It was also utilized as a way to explain story character emotions that study participants had difficulty understanding when encountered. For example, participants were frequently asked to model the same facial expressions found in a target emotion encountered in the narratives. The hand mirror was used to provide the participant with immediate feedback with respect to the accuracy of the produced expression. If the expression was inaccurate or not produced at all, the clinician would produce the expression and prompt participants to do the same. At other times, the clinician

would model the target expression and prompt participants to make an inference about the clinician's inner emotional state.

Inference charts. Inference charts utilized in intervention were essentially grids printed on paper. These grids listed story character names along the ordinate. The story context, inferred character emotion, and the reason why an emotion was experienced was listed along the abscissa. To facilitate a focus on one portion or another of the grid during intervention, participant responses were sometimes drawn by the child or written by the clinician on adhesive notes that were then placed on the chart in the appropriate place. On occasion, differing emotions experienced by the individual characters during specific events were contrasted by the clinician for the participants.

If an emotion inference made by a participant was incorrect, the appropriate emotion was suggested by the clinician with an explanation of its basis in the specific event context. For example, a participant incorrectly identified the emotion of sadness from the boy's facial expression as the boy prepares to bury a turtle he supposes to be dead, though the turtle is only pretending to be so. In this case, the clinician would indicate that the boy's facial expression was one of sadness and explain that the boy was sad because he believes that the turtle is dead. This illustrates one of the primary applications of the inference chart, which was to stress the principle that different characters—and indeed, people—can feel different emotions stemming from the same event because of their differing motivations and desires.

Journals. Journaling was utilized to reinforce study participant capacities to make inferences about emotion. Journals for study participants were composed of 3-ring binders filled with lined paper and the inference charts previously described. The journal served as a central component of intervention as it was used in at least one session each week for all participants.

After working through emotion inferencing opportunities provided in the narrative, participants would be directed to draw one of the emotions discussed in the story or during other intervention activities. The clinician provided cues about facial correlates of emotion while the child attempted to draw the target emotion. Further support aimed at generalization was attempted by asking the child to think of instances within their own experiences that would produce the same emotion. If no instance was provided by the child, the clinician provided hypothetical situations that would produce the target emotion or shared an instance from their own experiences demonstrating the same. Journal entries were frequently reviewed to reinforce successful emotion inferences.

Mind Reading software. To further support emotion inferencing, study participants were presented with target emotions using Mind Reading software, a program with a bank of still and video images of emotions as portrayed by actors. In a typical activity, several examples of a target emotion were presented while the clinician asked the child to name the target emotion. If the emotion was not named, the clinician modeled the target emotion name. A discussion of facial cues was then attempted with an emphasis on how facial cues could lead to correct interpretation of the emotion in question.

Training

Intervention was provided by two graduate student clinicians in the Communication Disorders program at Brigham Young University. These graduate student clinicians both had experience in the treatment of social communication disorders for children with LI. Undergraduate students assisted in providing baseline and follow-up measures and received training to do so from the study director. These same students also assisted in video recording intervention sessions and did so under the direction of the study director.

Intervention Fidelity

Intervention fidelity was accomplished in several ways including intervention scripts, regular intervention schedules, and periodic video review of intervention sessions.

Intervention scripts included predesigned lesson plans with supplemental prompts and questions as presented in Appendix B. These scripts provided a dependable foundation from which to administer intervention. They also afforded clinicians the flexibility to make online adjustments in intervention to meet the dynamic demands of social interaction with participants.

Intervention schedules were regularly coordinated and reviewed with clinicians to ensure that the appropriate intervention activities were administered to participants. Regular coordination allowed clinicians to share insights into the best ways to provide intervention for specific participant needs. These insights were based upon evolving clinician experiences gained by providing intervention to participants.

Fidelity across intervention sessions was further ensured by having two certified Speech-Language Pathologists experienced with social communication intervention for children with LI review session recordings. These independent reviewers periodically communicated any necessary adjustments to clinicians with the aim of maintaining a homogenous intervention approach.

Data Collection

Data collection for baseline and follow-up activities was carried out by undergraduate and graduate research assistants in the Communication Disorders program at Brigham Young University. These efforts were completed before and after implementation of the previously described intervention program in a quiet room at the elementary school attended by study participants. Both baseline and follow-up activities were video recorded while participant

responses were handwritten by students on printed scripts that contained the vignettes. These participant responses were then tallied and mean frequencies were calculated for correct answers to emotion inferencing queries.

Results

The mean frequencies for correct emotion inferencing responses both pre- and post-intervention for each study participant are presented in Table 3.

Table 3

Participant Mean Frequencies for Correct Emotion Inferencing at Baseline and Follow-up

Participant Identifiers	Targeted Emotions				Baseline & Follow-up Tasks
	Happiness	Fear	Anger	Sadness	
1 Ed	3.67/4.00	0.00/0.34	0.34/0.00	1.34/1.30	5.33/4.33
2 Bob	3.34/3.67	0.00/0.00	0.67/2.00	3.34/2.67	7.33/8.33
3 Maria	2.25/2.67	0.50/0.00	0.00/0.34	3.00/2.34	5.75/5.00
4 Mark	3.25/3.00	0.00/0.00	0.25/0.00	3.75/4.00	7.25/7.00
5 Brandon	3.20/3.34	0.20/0.00	1.80/2.34	1.60/3.00	6.80/8.67
6 Tyler	3.40/3.67	0.40/2.00	0.20/0.67	2.20/2.67	6.20/9.00

Note. Targeted Emotions = mean number of correctly identified items for Happiness, Fear, Anger, and Sadness at baseline are given before the slash and mean number of correctly identified items for the same emotions at follow-up are given after the slash; Baseline = overall mean number of correctly identified emotions from the baseline task are given before the slash; Follow-up = overall mean number of correctly identified emotions from the follow-up task are given after the slash. All numbers are rounded to the nearest hundredth with 4.00 being the total possible for each individual emotion and 16.00 being the total possible for the overall baseline and follow-up tasks.

Participant 1: Ed

Ed appeared to perform more poorly than all other participants based upon mean frequency scores before and after the intervention package was administered ($M = 5.33; 4.33$).

Ed's performance was a little lower than other participants on the baseline task and on the follow-up task, demonstrating fairly flat performance after intervention when compared to other

study participants. He consistently identified happiness before and after intervention. The emotions of fear, anger, and sadness remained difficult to for him to identify.

Participant 2: Bob

This child slightly increased his mean identification of emotions from pre- to post-intervention ($M = 7.33; 8.33$). Bob's performance was a little better than the other participants on the baseline task and on the follow-up task. Happiness was the most consistently identified emotion both in the baseline and follow-up tasks, while fear was never correctly identified. Sadness was the next most correctly identified emotion, followed by anger. Bob made notable gains in identifying anger, increasing over a point (indicating an average of over one or more trial correct per administration), but decreased somewhat in identifying sadness.

Participant 3: Maria

This child dropped slightly in her mean inferencing score from pre- to post-intervention ($M = 5.75; 5.00$). Maria's performance was a little lower on the baseline task and on the follow-up task, most likely resulting from chance differences in performance. Sadness was her most correctly identified emotion before intervention while sadness and happiness were identified an equal number of times after intervention. She identified fear correctly in only 2 instances before intervention and not after; conversely, anger was identified correctly by her only once after intervention and not before.

Participant 4: Mark

This child slightly dropped in his mean inferencing of emotions from pre- to post-intervention ($M = 7.25; 7.00$). Mark's performance was relatively stable before and after the intervention. He showed a slight decrease for happiness and anger and a small increase for sadness. Mark most frequently identified sadness correctly, followed by happiness. Fear was

never correctly identified by this participant, and anger being correctly identified only once before intervention.

Participant 5: Brandon

This child notably improved his mean correct identification of emotions from pre- to post-intervention ($M = 6.80; 8.67$). Brandon identified happiness at a relatively high level of accuracy before intervention and a similar performance was observed following intervention. Brandon made gains in identifying scenarios that would be expected to elicit both sadness and anger. Fear was correctly identified only once after intervention.

Participant 6: Tyler

This child improved his mean correct inferencing of emotions from pre- to post-intervention more than any other participant ($M = 6.20; 9.00$). Happiness was by far the most often correctly identified emotion by Tyler, with only a few instances of misidentification. Sadness was identified correctly the most often after happy, with at least one instance of 100% identification in one session. He correctly identified fear on only 2 occasions or 10% of instances before intervention, though he managed to so in 50% of instances after intervention. Anger was identified correctly only a few times across the baseline and follow-up tasks.

General Results

While happiness was correctly identified to a relatively high degree by all participants, other emotions such as fear proved especially difficult for children with LI to identify. Only one participant, Tyler, notably improved his identification of fear. Anger was similarly difficult for participants to identify, with most correct inferences for this emotion likely coming as the result of chance. Interestingly, two participants, Maria and Mark, identified sadness more often than the other targeted emotions.

In a general sense, participants demonstrated considerable difficulty making correct emotion inferences during the baseline and follow-up tasks. Emotion inferencing tasks during intervention were also clearly difficult, as evidenced by the avoidance behaviors demonstrated in one degree or another by all participants. These outcomes were in keeping with the current literature (Ford & Milosky, 2003; Spackman et al., 2006).

Discussion

Children with social communication problems often have difficulty with emotion understanding. It is generally accepted that children with ASD exhibit problems with emotional competence (Williams, Botting, & Boucher, 2008). A recent study has suggested that children with LI also have some difficulty inferring what emotion a person might experience given a particular scenario (Ford & Milosky, 2003). The current study was undertaken to determine the efficacy of an intervention program based on the telling and retelling of narrative vignettes for children with LI using an inferencing task similar to those used by Ford and Milosky (2003) and Spackman et al. (2006).

Although this study confirmed the emotion inferencing difficulties of children with LI documented in the literature, it also demonstrated that the intervention program presented appeared to be effective for some participants in increasing their capacities to infer emotions when given a scenario designed to elicit a specific emotion. These results were best observed in both Participant 5, Brandon, and Participant 6, Tyler—the former diagnosed with ASD and the latter with LI. Other participants did not appear to produce notable changes in their ability to identify emotions from a given situation based upon study follow-up results, with fluctuations in performance likely the result of chance.

Evaluation of Individual Performance

The reasons for limited emotion inferencing success after intervention for some study participants are likely complex and multifactorial (Creusere, Alt, & Plante, 2003; Berk, Doehring, & Bryans, 1983; Courtright & Courtright, 1983; Fujiki, Spackman, Brinton, & Illig, 2008; Holder & Kirkpatrick, 1991; Spackman, Fujiki, Brinton, Nelson, & Allen, 2006; Trauner, Ballantyne, Chase, & Tallal, 1993). Additionally, these reasons may not be entirely documented in the literature as only a handful of studies to date have attempted to explore social communication interventions for elementary school age children with LI. As concrete explanations of both positive and negative performances are difficult to extract from the literature, some speculation as to the individual performance of participants may therefore be appropriate.

Participant 1, Ed, had an emotion inferencing performance that cannot be explained exclusively by problematic behaviors associated with ASD, as another participant with ASD, Brandon, improved his emotion inferencing capacities for specific emotions. Inconsistencies in regulating his own emotions influenced Ed's overall success. Even small changes to routines proved upsetting (e.g., transitions from one activity to another proved upsetting). Ed often refused to participate, indicated the desire to be removed from the session to see his mother, and even wept on occasion. On other occasions he was uninterested in the intervention. Further attempts by the clinician to elicit participation typically resulted in shouted refusals and escalated displays of displeasure.

Emotion inferencing was clearly difficult for Bob based upon his performance. It may be that he required a more concentrated or longer intervention approach to produce more general gains in emotion inferencing performance.

Maria frequently indicated a lack of interest in the repetitive nature of the narrative telling and retelling and occasionally required convincing by the clinician to participate actively. She might have benefited from an intervention approach based upon several simplified opportunities for emotion inferencing. Such an approach may have helped her to focus on specific emotions. Performance in such an approach would have to be carefully monitored, however, to ensure generalization to more naturalistic contexts.

Whether the story intervention task was fully accessible to Maria should also be considered. She may have lacked the language comprehension skills to process fully the narratives. Her score on the paragraph comprehension subtest of the CASL was over two standard deviations below the normative mean. This also might explain her expressions of avoidance. A revised intervention approach might include shorter story vignettes with simplified contexts and language that could be quickly comprehended.

Participant 4, Mark, had slight variations in performance that were likely the result of chance. Mark often demonstrated difficulty attending to intervention tasks, though this was often attributable to his interactive style and desire to communicate socially on subjects unrelated or oblique to immediate activities. The inability to stay on task likely contributed to his overall decline in emotion inferencing success. As with Maria, Mark may have benefited from several opportunities for inferencing emotion that relied upon a simplified story context. It is interesting to note that sadness was the emotion successfully identified most often by both Maria and Mark.

Though Brandon had a higher UNIT Full Scale IQ score than all other participants and Tyler had the highest core language score on the CASL of all participants, there was nothing in their general profiles that would unduly suggest a greater overarching propensity for success. Both children, however, were generally engaged with the materials and intervention approach

throughout the duration of the study. In fact, after distractions both children could be brought back to the task at hand by the clinician with relative ease. Additionally, both children appeared to genuinely enjoy some aspects of intervention, especially drawing in the journals. Both children frequently began intervention sessions by requesting to draw in their journals and both clearly enjoyed reviewing previous drawings with the clinician. The higher level of emotional engagement and even positive affect by both of these children is a likely explanation for their relative success during the intervention. It also suggests that individuals who enjoy participating in a particular intervention are more likely to respond favorably to the intervention.

General Implications

The variability observed across participants has important implications for treatment. One important implication stems from the high degree of individual variation within diagnostic categories. To elaborate, accurate diagnostic categories can provide valuable and even critical information regarding general capacities, but they are not likely to capture the individual capacities and deficits of an individual. They may also not account for the fact that a particular individual might fit in more than one category, especially as the literature evolves and clinical thinking about diagnostic categories changes. Along these lines, it is possible that individual participants could have benefited from different intervention materials that appealed more to their immediate interests. Such an individualized treatment program would likely sustain interest for a greater period of time and may have resulted in greater individual engagement in intervention.

It is clear from study data that diagnostic categories were insufficient to predict the success of study participants. The intervention package was successful for some children, as indicated by their positive responses to intervention. For example, Brandon and Tyler made

notable improvements to emotion inferencing capacities, at least as reflected by performance on the task used in baseline and follow-up measures. These successes may have been due, at least in part, to the considerable flexibility afforded by the intervention package and the resulting naturalistic communication style it allowed, a style which mirrored genuine social communication found inside and outside of the classroom environment of these children. It is also likely that the fact that these participants enjoyed the intervention and appeared to be highly engaged had an impact on their success.

Study Limitations

Given the qualified conclusion of success for selected participants, there are limitations to this study that should receive consideration. First, participants were six children from one elementary school in the western United States. This group of children with LI and ASD did not reflect typical caseloads and allowed for a much more detailed investigation into the effects of the study intervention program than would have otherwise been possible with a greater number of participants. However, this number of participants did limit generalization of study results to the general LI and ASD populations. Second, the intervention program utilized in this study, while designed as a package, was complex in its implementation because of the individual needs of the participants. This approach not only allowed for needed flexibility in providing intervention, but also afforded the clinician the capacity to respond to the dynamic demands of genuine communication in intervention rather than simply administering tasks with a rote script. In fact, these conditions seemed to be closer to the actual communication environments experienced by participants inside and outside of the classroom than may have been afforded by a more rigid intervention program design. However, the results of this study point to the aggregated success of the intervention program components without identifying which aspects

were most crucial and effective in increasing capacities for emotion inferencing. Given the individual needs of the participants, it may be that some elements of the program were more important and even critical depending upon which child was considered.

A third consideration was that the emotion inferencing intervention was relatively short. It remains to be seen if those participants with slightly diminished mean frequencies for emotion identification at the time of follow-up could have bolstered their performance scores by continuing intervention. The length and intensity of intervention may have significant clinical implications for those seeking to maintain the emotion inferencing capacities of clients faced with social communication deficits. It is possible that 20 sessions of intervention were insufficient to address what are, by definition, long-term social communication challenges. This issue requires careful consideration by clinicians and future researchers.

A fourth consideration is that the specific emotion inferencing task utilized in the baseline and follow-up procedures may not have fully reflected what participants learned. To elaborate, a child may have increased emotion inferencing capacities for naturalistic settings, even though this may not have been reflected in a structured task.

With these qualifications in mind, it should be noted that the intervention program examined in this study did indicate that specialized treatment could produce notable gains in some children with social communication deficits even with a short intervention period. Given that that these types of problems are more common in children with LI than traditionally believed and that they have a significant influence on peer interactions (Berk, Doehring, & Bryans, 1983; Courtright & Courtright, 1983; Creusere, Alt, & Plante, 2003; Fujiki, Spackman, Brinton, & Illig, 2008; Holder & Kirkpatrick, 1991; Spackman, Fujiki, Brinton, Nelson, & Allen,

2006; Trauner et al., 1993), the intervention program discussed could potentially produce notable long-term benefits to the social communication capacities and relationships of these children.

Future Research and Intervention Package Modifications

Future examination of the emotion inferencing capacities of children with LI or ASD may profitably focus on confirming the results afforded by the intervention plan implemented in this study. Attention in future research may also be reasonably given to including a larger number of participants with LI or ASD to determine the potential of generalization for these populations, examining the effects of individual intervention program components, and analyzing the effects of long-term clinical support in maintaining and improving emotion inferencing capacities.

Other alterations to the intervention package may be examined by future research efforts. For example, children with LI might also be afforded more flexibility in choosing which stories they wish to engage in when attempting emotion inferencing. Providing a bank of stories to choose from may consequently alleviate some of the avoidance of intervention activities intermittently demonstrated by some participants. Participants in this scenario might be provided with several story narratives suitable for emotion inferencing. These story narratives might take the form of simplified vignettes that participants could choose from, especially for those children susceptible to demonstrate avoidance during the relation of more involved story contexts.

Finally, intervention package activities often involved emotion inferencing practice that was subsequently related back to what emotions participants might experience in the same scenarios. Research may determine the feasibility of an intervention approach focused more upon emphasizing connections between the emotions narrative vignette characters demonstrate and the emotions participants might experience when given the same narrative scenarios. To

elaborate, story narratives remain indirect avenues to emotion inferencing as participants must be willing to invest in the abstract nature of plot points and characters. Intervention focused on drawing direct parallels to participant emotion potentially provides a more direct avenue to improving emotion inferencing capacities. Pursuing this intervention approach may alleviate the avoidance of story narratives demonstrated by some children and replicate the emotion inferencing successes seen with two study participants, Brandon and Tyler.

Conclusion

Children with LI demonstrate several social communication difficulties including conversational deficits (Adams & Lloyd, 2005; Bishop, Chan, Adams, Hartly, & Weir, 2000; Brinton, Fujiki, & Powell, 1997; Brinton, Fujiki, Loeb, & Winkler, 1986; Brinton, Fujiki, & Sonnenberg, 1988; Fujiki & Brinton, 1991; Merrison & Merrison, 2005) and problems entering peer interactions (Brinton et al., 1997; Craig & Washington, 1993; Liiva & Cleave, 2005). Of particular difficulty for children with LI is emotion inferencing (Ford & Milosky, 2003; Ford & Milosky, 2008; Spackman et al., 2006), a factor closely tied to social communication problems for this population (Denham, 1998).

The current study demonstrated that some children with LI can potentially garner notable improvements to emotion inferencing capacities from an intervention program based on the telling and retelling of narrative vignettes as evaluated using an inferencing task similar to those used by Ford and Milosky (2003) and Spackman et al. (2006). While future research is needed to confirm these results and to determine the most efficacious components of the intervention program presented, it appears reasonable to conclude that these potential emotion inferencing improvements could also reduce the social communication difficulties of some children with LI. Further investigation may additionally corroborate the observation that the children with LI that

garnered the most from intervention were those that approached narrative telling and retelling with a positive affect and readily engaged in reflective journaling tasks.

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Appendix A

Adams, C., & Lloyd, J. (2005). Elicited and spontaneous communicative functions and stability of conversational measures with children who have pragmatic language impairments. *International Journal of Language and Communication Disorders*, 40(3), 333-347. doi:10.1080/13682820400027768.

The purpose of this study was to determine the efficacy of elicited communicative function in identifying the social communication details of children with Pragmatic Language Impairment (PLI).

Participants included 10 boys and 5 girls diagnosed with PLI (age range = 7;3-11;6) from the Northwest and West Midlands in England and Northern Ireland and a control group of typically developing peers matched by age (within 3 months) and gender. The study included an elicitation and conversational task; all children participated in the elicitation task, while 10 children from the group with PLI (6 boys and 4 girls; mean age = 9;10) and 10 children from the control group (mean age = 9;8) participated in the conversation task. The elicitation task involved what was originally termed in the literature as “The Peanut Butter Protocol” and was designed to target 19 communicative functions delineated in an appendix to the study. The elicitation task was completed twice for each child with a 2-to-16 week interval between assessments. Each elicitation task target behavior was graded as elicited, not elicited, or not observable. The conversational task was approached through black and white photograph prompts designed to elicit particular topics with the aim of discussing study participant experiences that were similar. Conversational task results were evaluated through a number of indices including discourse participation, conversational dominance, assertiveness, verbosity, responsiveness, and meshing.

Results for the elicitation task did not distinguish between the control groups and the group with PLI. A 2 x 2 mixed factorial ANOVA design for the conversational task showed effects for the group with PLI in questions, clarification requests, clarifying responses, and recapitulations; response problems and pragmatic problems were subsequently found for the group with PLI.

The authors concluded that significant differences could be found for conversational measures and indices for the group with PLI. This study contributed to the current work by describing the social conversational deficits associated with children with LI.

Berk, S., Doehring, D. G., & Bryans, B. (1983). Judgments of vocal affect by language-delayed children. *Journal of Communication Disorders, 16*, 49-56. doi:10.1016/0021-9924(83)90026-6.

The aim of this study was to examine differences between children with delayed language and children with typical language development in judgments of vocal affect.

Participants were 19 children with delayed language (6 girls and 13 boys; age range = 5-11) and 19 control children with typically developing language (9 girls and 10 boys). A professional actress recorded 15 two-to-five syllable utterances several times each in a happy, sad, or angry voice. A panel of 6 undergraduate students selected the best recordings for the 10 utterances ultimately utilized in the study for a total of 30 samples with 7-15 s intervals between stimuli. Participants were presented with these recordings in random order and instructed to indicate the emotion in the recording by pointing to line drawings of a girl's face displaying happiness, sadness, or anger.

Results indicated that the performance of the group with language delay was significantly lower than that of the typical language group. Further analysis indicated that typical children

showed a bias in judging happy voices as angry while language delayed children showed bias in judging sad voices as happy and happy and sad voices as angry. This work contributed to the current study by elaborating upon the emotion identification deficits of children with delayed language when compared to their typically developing peers.

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*, 177-199. doi:10.1017/S0954579400002042.

The aim of this study was to examine the conversational responsiveness of groups with SLI and PLI.

Individual participants were 18 children between the ages of 6 and 8 years of age diagnosed with language impairments; all but 2 of these children were recruited from special education units for children with SLI. The control group consisted of 9 typically developing children matched for age and non-verbal ability and 9 typically developing younger controls matched for comparable language levels. Conversational samples with an adult were initially elicited through black and white photographs, though adults attempted to have participants describe similar experiences for a conversation lasting between 7 and 12 min. Coding for these conversations marked conversational turns, no responses, non-lexical verbal responses, minimal verbal responses, extended verbal responses, and responses that were grouped into together because they did not fit into the aforementioned categories. Codes were also meshed to see how well they fit with adult soliciting utterances. Analyses utilized descriptive statistics to express the frequency of different child response types.

Results demonstrated the group with PLI had a significantly low rate of non-verbal responses, both the groups with SLI and PLI had lower rates of adequate responses than typical peers, and both the groups with SLI and PLI tended to have more pragmatically inappropriate responses than the older control group. Children with the most pragmatically inappropriate responses could be characterized by their low level of nonverbal responses in conversation.

The authors concluded that a subset of children with LI demonstrated more than just difficulty with language form that includes broader pragmatic difficulties. This study contributed to the current work by demonstrating the conversational deficits associated with children with LI.

Brinton, B., & Fujiki, M. (1991). Responses to requests for conversational repair by adults with mental retardation. *Journal of Speech and Hearing Research, 34*(5), 1087-1095.

<http://jslhr.asha.org/>

The aim of this study was to determine how adults with intellectual disability responded to stacked clarification requests.

There were 44 participants in community placements (average age = 30 years) and 22 from institutional placements (average age = 28 years). Participants in community settings had a mean full-scale IQ of 61.45 on the Wechsler Adult Intelligence Scale-Revised; by the same measure, participants in institutional settings had a mean full-scale IQ of 62.23. The study gathered 30 minute conversational sample from participants with an investigator acting as an employer and participants acting as interviewees. The investigator initiated 10 stacked clarification requests during conversation with 3 neutral clarification requests per sequence. Coded subject repair types included repetition, revision, addition, cue, and inappropriate attempts. Reliability between transcribers was determined using a compared random sample of

10 repair sequences with a final interjudge score of 90%. All coding of transcriptions reached at least 80% interjudge reliability.

The authors found that participants produced a variety of repair strategies, though both groups had a high proportion of inappropriate repair attempts. Overall, a lack of sensitivity to conversational partner needs was demonstrated by participants. This study contributed to the current project by discussing a conversational deficit.

Brinton, B., Fujiki, M., & Higbee, L. M. (1998). Participation in cooperative learning activities by children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 41*, 1193-1206. doi:1092-4388/98/4105-1193.

The purpose of this study was to determine the behavioral tendencies displayed by children with SLI during group tasks.

The study sampled 54 children divided into 18 triads. Each of the 6 target triads had 1 child with SLI, and 2 children matched to the target child for age, and 1 child matched for gender and age. The remaining participants made up chronological age-matched and language-matched triads of typical children. After taking part in other activities, these triads were asked to build a periscope based upon a model provided by the investigator. Materials were also provided by the investigator who remained behind a partition while the children worked on the periscope. The investigator provided minimal responses for assistance when asked. Data was collected through transcription and analysis of the cooperative periscope building activity based upon coding for verbal and nonverbal activity. Reliability between transcribers was sampled using a separate triadic transcript with agreement reaching 90%. Coding reliability was similarly examined using three samples and was over 90% for all subcategories of verbal and nonverbal collaboration.

The authors found that the age-matched and language-matched triads engaged in a high level of cooperative behavior during the periscope building activity. Interactions within the triads with SLI were variable, though verbal interactions were generally ineffective. This study contributed to the current investigation by demonstrating that children with LI have difficulty with specific social tasks, especially those where collaboration is required.

Brinton, B., Fujiki, M., Loeb, D. F., & Winkler, E. (1986). Development of conversational repair strategies in response to requests for clarification. *Journal of Speech and Hearing Research, 29*(1), 75-81. <http://jslhr.asha.org/>

The purpose of this study was to investigate child responses to stacked clarification requests during a structured conversational task. There were 40 total participants divided into four age levels (2;7-3;10; 4;10-5;10; 6;10-7;10; and 8;10-9;10) from a single elementary school in Nevada. For the experimental task, a child and the examiner were seated at a table and separated by a 42 X 20 half-inch cardboard screen with a slot. After a trial item, 20 picture cards (10 control pictures and 10 experimental pictures) were passed through the screen by the examiner with instructions for the child to describe everything happening in the image. The child was also instructed not to show the pictures to the examiner. All children received the picture series in the same order. Descriptions of control pictures were acknowledged by the examiner with backchannel responses while experimental pictures elicited stacked clarification requests. The examiner indicated the need for clarification until three requests had been made. If a child responded with a conversational repair on the third request, the examiner indicated understanding. Completed conversations for each picture were rewarded with tokens that could be exchanged at the end of the session for a prize chosen from a menu. Conversations were

coded for 5 major types of repair. These categories were repetition, revision, additions, cues, and inappropriate responses.

The resulting data were analyzed using a two-way analysis of variance for each of the 5 major coding category types with age level and clarification request type functioning as independent variables. Age differences were not found to produce significant effects, though question types utilized during the clarification requests did have a significant influence with more repetitions being demonstrated for the first question “Huh?” than for the second question “What?” across the age groups tested. Analysis also indicated that no age group used revisions significantly more than any other and additions increased with age. On the third clarification request 9-year-old children produced far more cues than other age groups. Additionally, significant differences for inappropriate responses were found for age level and clarification request type with the 3- and 5-year-old groups, especially for the “I didn’t understand that” type request. Interjudge reliability was based on 13% of the entire sample that was randomly chosen and found to be at the 90% level of agreement for two investigators that had received training in coding the project.

The authors concluded that all age groups responded to most attempted requests for clarification, though there were data demonstrating that inappropriate or no attempt at repairs were also made. They also found that inappropriate responses decreased with chronological age and that repetition was the most common strategy employed by all age groups. All age groups provided additions while revisions remained an infrequent repair strategy. Only the 9-year-old group provided any significant number of cues. This study contributed to the current work by presenting repair strategy tendencies for various age groups.

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, 3-11. <http://lshss.asha.org/>

The purpose of this study was to document difficulties demonstrated by children with SLI in topic manipulation and assess types of topics that best lend themselves to evaluation in clinical populations.

Participants included 10 children with SLI (age range = 6;4-7;4), 10 age-matched control children (age range = 6;4-7;4), and 10 language matched children (age range = 4;3-5;4). All participants were monolingual native English speakers. For the experimental task, all participants had interacted with an adult examiner. The adult introduced 6 topics. Once the topic was introduced, the adult provided feedback and encouragement while observing to see if the topic could be maintained. Participant language production was coded as maintained, new topic introduction, appropriate, or inappropriate. Conversational analysis was approached through mean frequency counts for each of the coded behaviors.

Results indicated that participants with SLI had more difficulty than the age and language matched control groups maintaining verbal topics. A one-way ANOVA was utilized to determine the proportion of appropriate utterances used to maintain a topic. The group with SLI performed significantly worse than the control groups. A two-way ANOVA indicated that while children with SLI introduced more topics than the control groups, this rate did not rise to the level of statistical significance; further descriptive analysis indicated that children with SLI had difficulty maintaining their own topics appropriately.

The authors concluded that children with SLI could be separated from typically developing age-matched peers by their difficulty appropriately maintaining topics introduced by

a conversational partner. This study contributed to the current work by demonstrating interactional deficits in the conversational ability of children with LI.

Brinton, B., Fujiki, M., & Sonnenberg, E. A. (1988). Responses to requests for clarification by linguistically normal and language-impaired children in conversation. *The Journal of Speech and Hearing Disorders*, 53(4), 383-391. <http://jshd.asha.org/>

The aim of this study was to examine how children with LI responded to stacked neutral clarification requests when compared to age-matched and language age-matched peers.

Study participants included 8 children with LI (age range = 7;6-11;1 years), 8 age-matched children (age range = 7;6-11;2), and 8 language age-matched peers (age range = 5;6 to 8;4); target children with LI were chosen for deficits in comprehension and production while demonstrating typical non-verbal intelligence. A 30-min language sample based on opinions about toys and events such as Christmas vacation was gathered for all participants by an adult examiner. Ten stacked clarification request sequences were initiated by the examiner during the language sample with sequences spaced at approximately 3 min. Language samples were video recorded and coded for verbal, gestural, and suprasegmental information; verbal information was further coded into categories of repetition, revision, addition, cue, and inappropriate. Gestural and suprasegmental information was coded only when they indicated additional information from original utterances. Interjudge reliability was assessed using a random sample and found to be 93% in agreement. A two-way ANOVA was performed for four of the verbal response categories with the fifth category (repetition) being excluded because of concerns over dependency issues. Repetition was analyzed informally and found to have decreasing frequency for all groups as sequences progressed. A three-way ANOVA was performed for gestures and suprasegmental information with significant effects found for request type.

The study authors found that gestures increased significantly between first to second and second to third requests. Suprasegmental responses were significantly more frequent for “what?” than the other two responses.

The authors concluded that children with LI produced several inappropriate responses while typically developing children produced very few. Age-matched children also produced more additions than the other two groups, perhaps indicating that verbal complexity is generally needed to clarify messages. Children with LI and language age-matched scores also revised the message more than typically developing children. Finally, cues were produced less frequently by children with LI. Gestures increased for all groups as the sequence progressed and suprasegmental changes were similar across the study groups. Overall, the authors concluded that while children with LI had repair strategies, they did not always persist in using them. This research contributed to the current study by demonstrating some of the conversational repair deficits associated with the LI profile.

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), 1011-1026. <http://jslhr.asha.org/>

The aim of this study was to assess the ability of children with SLI to access and participate in ongoing dyadic social interactions.

Participants (age range = 8;10-12;5) included 54 children in total divided into 18 triads. Each triad was composed of one target child and two partners. Target children included 6 children with SLI, 6 children matched for chronological age, and 6 children matched for language test scores similar to those of the group with SLI. Partners were seated together under the premise that the investigator was attempting to determine which toys children their age

enjoyed playing with. A number of toys were introduced by the investigator and the partners were subsequently encouraged to play with these items. Once partners engaged in the play task, the investigator sat at a desk that was out of view due to the placement of a cardboard barrier. After approximately 10 minutes, a second investigator escorted the target participant into the room and the initial investigator introduced the partners to this individual. This individual was left to gain access to the partner play activity for approximately 20 minutes. Questions addressed to the investigator were answered with simple responses. Transcription began at the introduction of the target participant and was examined for utterance production, utterances addressed to each participant, access episodes, partner inclusion bids, and participation in the group activity. Reliability between transcribers and coding for point of access, partner inclusion bids, address utterances, and group participation was calculated with reliability at 95% or greater for all coding except for address utterances which was at 89%.

Study results indicated that while all typically developing children could access ongoing interactions, they varied in the amount of time it took to do so. They also found that some children with SLI took longer to gain access and two children did not gain access during the 20 min interaction. The children with SLI that did manage access to the group activity were less integrated into the play.

The authors speculated as to the language and/or social deficit origins of this poor performance. They concluded that both language and social deficits should be considered for intervention planning for children with SLI. This study contributes to the current work by presenting the difficulties children with LI encounter in trying to access groups.

Courtright, J. A., & Courtright, I. C. (1983). The perception of nonverbal vocal cues of emotional meaning by language-disordered and normal children. *Journal of Speech and Hearing Research, 26*(3), 412-417. <http://jslhr.asha.org/>

This study addressed two primary research questions related to the emotion identification capacities of children with LI. The first was to gather evidence of differences if they existed between children with LI and typically developing children in interpreting vocal expressions of emotion. The second purpose was to determine if either language or age factors could be a superior predictor of differences between typical and language disordered children's abilities to interpret emotion from vocal cues. Participants included 49 children with 33 boys and 16 girls (age range = 3-7) representing all socioeconomic levels; of this total, there were 25 children diagnosed as moderately or severely impaired in expressive language while the remaining 24 children had typically developing language. Spontaneous language samples were gathered from each child and analyzed using the Developmental Sentence Scoring procedure. The authors also administered the Peabody Picture Vocabulary Test and a nonverbal emotion interpretation task. In order to gauge child sensitivity to vocal cues of emotion, the authors developed an instrument labeled the Measurement of Vocalic Sensitivity (MOVS) wherein a neutral content complete sentence was spoken by three distinct male actors' voices to indicate each of the emotions happiness, anger, love, and sadness for a total of 12 spoken sentences. Children were asked to point to photographs of males representing the target emotions with the depiction of love being a father hugging his child. Responses were checked off of a form by an experimenter with a 10 s time limit for each response.

Undergraduate students recruited to test the content validity of MOVS correctly matched the recorded voices to pictures 96% of the time. An ANOVA indicated performance differences

between the group with impaired language and the typically developing group with the former group scoring significantly lower than the later. These differences were accounted for in further analysis by language age factors. Analysis also indicated that both language groups were fairly accurate at identifying the emotions with negative valence while both groups had difficulty with those of positive valence. This work contributed to the current investigation by documenting the emotion inferencing deficits of children with LI.

Craig, H. K., & Washington, J. A. (1993). Access behaviors of children with specific language impairment. *Journal of Speech and Hearing Research, 36*(2), 322-337.

<http://jslhr.asha.org/>

The purpose of this study was to characterize the group access difficulties of children with LI.

Participants included 38 children with 13 children acting as subjects and the remaining 25 children acting as partners. Of those children acting as subjects, there were 5 diagnosed with SLI while the remaining 4 children acted as controls being matched for age and 4 acted as controls being matched for comparable language skills. Partners were introduced by the experimenter and instructed to use a set of building blocks. After 10 min of play, the experimenter introduced the subject child without instructions on his or her role in the interaction. This new interactional dynamic was observed and recorded for 20 min. Transcriptions of these interactions were coded into access episodes, task-related, and task-unrelated segments. Interjudge reliability was gauged at 84% or above for coding tasks.

Results demonstrated that all typically developing children gained access while only 2 children with SLI were able to do so. The authors found that those children with SLI that did not

gain access also did not approach the group, present with many task-related behaviors, and had speech that was not directed towards gaining access or had a self-focused or negative quality.

The authors concluded that failure to gain access to a relatively simple group task indicated potential problems in friendship formation, learning from peers, and appropriate socialization. This study contributed to the current work by demonstrating the difficulties children with LI have with social tasks involving language, specifically in gaining access to group interactions.

Creusere, M., Alt, M., & Plante, E. (2004). Recognition of vocal and facial cues to affect in language-impaired and normally-developing preschoolers. *Journal of Communication Disorders*, 37, 5-20. doi:10.1016/S0021-9924(03)00036-4.

The aim of this study was to determine if difficulties in identifying vocal and facial cues in children with LI could be explained in part by various nonparalinguistic factors.

Participants were 52 total children with 26 children diagnosed with SLI (age range = 4;2-6;5) and 26 age- and gender-matched children with typical language development (age range = 4;0-6;5). Four blocks of study stimuli were presented to participants by computer. This initially included 6 adult speakers providing 54 utterances implying happy, sad, mad, or surprised feelings. These utterances were divided into a face-only block without audio, a filtered-speech-only block without any video, a face-plus-filtered-speech block, and an unfiltered-speech-plus-face block that acted as a control. Participants received a brief introduction to each stimuli block before presentation and a forced-choice question inquiring about the emotions presented. A one-way ANOVA was utilized to determine that there were no participant performance differences across the three stimuli sets when given varied block orders and items. The group with SLI was found to have lower scores overall than the children with typically developing language, even for

the tasks in which both facial cues and unfiltered speech were available. However, children with SLI recognized emotion as frequently as their peers with typically developing language when presented with filtered speech alone or with facial cues and filtered speech in combination.

The authors qualified these findings by indicating the effects of young participant ages across language groups in failing to interpret accurately filtered speech. The authors concluded that various types of nonliteral social speech acts may be particularly difficult for children with SLI and may put them at risk for poor performance socially. This study contributed to the current work by further exploring the emotion recognition deficits and resulting social difficulties of children with LI.

Denham, S. A. (1998). *Emotional development in young children*. New York: Guilford Press.

In this book, Denham described the changing emotional capacities and behaviors of preschool children in a developmental sense. These capacities were discussed using scholarly research and supporting examples, often in the context of social interactions. This work was important to the current study in that it demonstrated that children with difficulties understanding, regulating, and expressing emotions were also likely to experience social difficulties.

Ford, J. A., & Milosky, L. M. (2003). Inferring emotional reactions in social situations:

Differences in children with language impairment. *Journal of Speech, Language, and Hearing Research*, 46, 21-30. doi:1092-4388/03/4601-0021.

The purpose of this study was to determine if children with LI had difficulty identifying facial expressions, if they could integrate facial expressions with other verbally and/or visually presented information to reach correct social inferences, and if inferencing difficulties were modality specific.

Participants included 12 children with LI (age range = 5;4-6;4) and 12 typically developing children (age range = 5;4-6;2) attending kindergarten in the central New York area. All participants were monolingual native English speakers. Production of emotion labels, comprehension of emotion terms, and emotion inferencing were undertaken as experimental tasks. For the production task, sad, happy, mad, and surprised emotions were presented in drawing format to participants and they were asked to label the target emotion. In the comprehension task, participants were asked to point to target emotions using the same four drawings utilized in the production task. For the inferencing task, children were asked to listen to a story with pictures about Twinky, a story protagonist placed in situations designed to elicit the target emotions. Nine story scenarios were generated for each target emotion.

An ANOVA was undertaken to determine interaction between group, modality type, and emotion for the inferencing task. Analysis indicated that children with LI were not as proficient as typically developing peers in inferring emotions, that there was a main effect associated with modality (Tukey's HSD procedure indicated that combined verbal/visual modalities produced more correct inferences than the visual modality alone), and that there was a main effect for emotion with the group with LI having difficulty regardless of the emotion presented. An ANOVA was undertaken for comprehension tasks and results showed that children with LI were more likely to infer emotions of a different valence when compared to their typically developing age-matched peers. Regression analysis was performed to determine how nonverbal cognition and language influenced the visual component of the inferencing task. The results indicated that language significantly influenced inferencing ability even when the stimuli were only presented visually.

The authors concluded that inferencing errors occurred during the early social processing stages for children with LI and may account for some of the social difficulties demonstrated by this group. This study's inferencing task with its associated story scenarios was replicated as part of the current study.

Ford, J.A., & Milosky, L.M. (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*, 367-380. doi:1092-4388/08/5102-0367.

The purpose of the study was to determine if typically developing children and children with LI infer emotions during discourse while examining this capacity in the context of social competence.

Participants included 16 children with LI (age range = 4;6-5;7) matched to 16 children with typical language development (age range = 4;6-5;7) from central New York. There were 8 boys and 8 girls in the group with LI and 7 boys and 9 girls in the typical language group. Participants response times were recorded using DirectRT for seven experimental items including the following: vocal response time measures; inferencing tasks; receptive language measures; non-verbal cognitive measures; confrontational naming measures; drawing tasks; and situations causing emotions. Vocal response time measures involved 20 trials of participants saying "go" when a green light appeared on the laptop screen. A total of 36 narrated animated stories (18 filler and 18 experimental) were presented using a portable laptop computer where children were asked to identify a facial expression (matched for half of the scenarios, mismatched for the other half of scenarios) or an object (filler stories). Receptive language capacities were determined using the receptive subtests of the CELF-P. Cognitive measures

included the nonverbal subtests of the KABC. Confrontational naming was undertaken using 40 two dimensional pictures of faces. Participants were asked to draw 3 pictures of themselves (happy, sad, and afraid) rated by undergraduate college students using an equal appearing interval scale. Using these participant produced drawings, children in the study were prompted to provide 3 situations that would produce the depicted emotion. A series of ANOVA and regression analyses along with hierarchical multilevel modeling were carried out to assess the study results.

The authors concluded that typically developing children made inferences during the comprehension process itself while children with LI often fail to make inferences at all. This failure was hypothesized to affect social interactions negatively. The scenarios utilized in this study form the basis for the scenarios replicated in the current study.

Fujiki, M., Spackman, M. P., Brinton, B., & Illig, T. (2008). 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.

The purpose of this study was to explore the ability of children with LI to understand emotion with narrative context as conveyed by prosody. Differences between particular emotions and gender were also examined in the context of the prosody delivered in the narrative task.

Participants included 19 children with LI (age range = 7;9-10;10) and 19 age-matched peers with typical language development (age range = 7;9-10;10). All children listened to actor recordings (2 male and 2 female) of a 7-sentence narrative read with prosody to convey happiness, anger, sadness, or fear. Recordings included 3 readings by each actor for each

emotion with the two highest male and female recordings chosen by 48 university students. Participants were asked to identify the emotion expressed by pointing to response cards with drawings and the corresponding emotion words represented; these response cards were not seen to complicate the task as indicated by a pilot study completed by the authors. All children received training to prepare them for the procedural task. Participant answers were scored (incorrect = 0; 4 = each recording correctly identified).

Analysis of co-variance (ANCOVA) was undertaken to determine how identification varied across language group, age, and emotion variables with a main effect found for language group with typically developing language participants performing better than children with LI. Additionally, happiness was most often identified correctly followed by anger, sadness, and fear. Children with LI were found to misidentify emotions at higher rates than children with typically developing language, especially for sadness and fear; this higher rate also held for children with LI misidentifying anger as happiness. This work contributed to the current study by developing the profile of emotion understanding deficits associated with children diagnosed with LI.

Harris, P. L. (2008). *Children's understanding of emotion*. In M. Lewis, J. M. Haviland-Jones, & L. Feldman Barrett (Eds.), *Handbook of Emotions* (3rd ed., pp. 320-331). New York: Guilford Press.

In this book chapter, the author discussed the emotion understanding of children in the context of their ability to describe feelings with words and how this changes with development.

The author refuted earlier work contending that child expressions of emotion were simply verbalizations substituting for actual reports of experienced emotions. Evidence was presented that demonstrated very young children could discuss past and future emotions. Emotion understanding was further defined not just as set of scripts for different emotions that the child

encounters, but as a set of scripts coupled with an appraisal process accounting for how individuals interpret situations based upon their own beliefs and desires or goals. This idea was further refined with the assertion that emotion is triggered not between desires and actual outcomes, but by desires and expected outcomes. This impact of belief upon emotions was not fully appreciated by children until 5 to 6 years of age. The author further examines this development of the child appraisal process through the emotion of guilt, noting that full development of this skill may not appear until middle childhood though younger children can experience guilt. This developmental process was then reviewed in the context of individual differences in emotion understanding, especially as related to forming social relationships outside of the family. Research suggested with qualification that those that performed better at emotional appraisals were also more popular. Finally, family conversation of emotions—particularly the discourse of mothers—was highlighted as a means to increasing appraisal skills in children.

This work contributed to the current study by providing a functional definition of emotion understanding for children that included recognizing and interpreting emotions in oneself and others.

Hart, K. I., Fujiki, M., Brinton, B., Hart, C. (2004). The relationship between social behavior and severity of language impairment. *Journal of Speech, Language, and Hearing Research*, 47, 647-662. doi:1092-4388/04/4703-0647.

This study aimed to determine how the severity level of LI is connected to withdrawal and sociability.

A total of 82 participants included 41 children with SLI matched to 41 children with typical language development. Teachers rated participant sociability levels using the Teacher

Behavior Rating Scale (TBRS). Additionally, the children with SLI were administered the CELF-R and categorized into moderate and severe groups based upon the scores. Group differences were examined using a series of 2 x 2 MANOVAs. Group differences were observed on behavior subtypes of reticence, solitary passive withdrawal, prosocial, and likeability, with children with SLI always being rated more poorly than their typical matches. In order to determine if the severity of LI predicted social behavior, median splits based on language ability were performed to create subgroups with moderate and severe LI. These subgroups were then compared with respect to the various social abilities.

Results indicated that there were not significant effects for group severity when withdrawn behaviors were considered, though girls with severe receptive deficits were rated more often as solitary-passive than girls with moderate deficits. Girls were also rated higher for prosocial behaviors than boys, as were those with only moderate expressive language difficulties.

The authors concluded from these results that LI was not closely tied to withdrawal. Severity of impairment was seen to influence sociable behavior, however. The subgroup with severe LI was less prosocial than the subgroup with moderate deficits. Participants with low receptive scores were also rated as less likeable, though this did not hold true for expressive scores. This study contributed to the current work by presenting social deficits associated with LI by examining them in the context of severity.

Holder, H. B., & Kirkpatrick, S. W. (1991). Interpretation of emotion from facial expressions in children with and without learning disabilities. *Journal of Learning Disabilities, 24*(3), 170-177. doi:10.1177/002221949102400305.

The purpose of this research effort was to examine the abilities of children with and without learning disabilities to identify happiness, fear, sadness, surprise, anger, and disgust from facial expressions.

Participants were 96 children in total divided equally between children with learning disabilities and those without. Children were also equally represented in two age groups (8.0-9.9 and 11.0-14.8 years). Each emotion was represented by 6 photographs of equally distributed male and female faces for a total of 36 photographs. For training, pairs of photographs were shown to participants by one of three examiners after a short scenario was read. Participants were asked to indicate which of the pair of photographs best represented the emotion of the scenario. Testing eliminated both the pairs of photographs and the scenarios and participants were asked to name the emotion in a single photograph presented for 10 s with 5 s intervals in between. Multiple responses were eliminated by asking participants to choose only one answer. A panel of four judges determined whether answers were correct or incorrect with complete agreement needed to validate a substitute label. Happiness was named most accurately by all groups and also had the lowest response time. Time for naming was also recorded. Three-way ANOVAS were performed to examine differences across learning groups, gender, and age groups.

Results indicated that children with learning disabilities were less accurate at interpreting emotions based upon the findings for fear and disgust. Children with learning disabilities also spent more time interpreting happiness and anger than their typically developing peers. This study contributed to the current work by demonstrating some of the emotion understanding deficits found in children with learning disabilities.

Horowitz, L., Jansson, L., Ljungberg, T., & Hedenbro, M. (2005). Behavioral patterns of conflict resolution strategies in preschool boys with language impairment in comparison with boys with typical language development. *International Journal of Language and Communication Disorders, 40*(4), 431-454. doi:10.1080/13682820500071484.

The purpose of this study was to examine the reconciliation behaviors and strategies of children with LI.

Participants for the study were 31 males (age range = 4-7) in a major Swedish urban area; eleven of these individuals were children with LI. Participants with LI were filmed in unstructured play independently from typically developing participants. Conflicts were naturally occurring and preschool routines remained unchanged by investigators so that the frequency of these scenarios varied from individual to individual. Participants were filmed for one to two sessions (duration of each session = 1 to 18 months) from 1993 to 2002 and conflicts coded as they became available. Conflicts causes were coded as abstract competition, object competition, physical harm, psychological harm, activity competition, and aberrance. Post-conflict reconciliatory behaviors were coded into the categories invitation to play, body contact, self-ridicule, cognitive, object offer, and verbal apology. Interjudge reliability was calculated for 2 randomly chosen sampling days and averaged at 92% except for the identification of post-conflict nonaffiliative behaviors and the distinction between conflict termination and post-conflict period commencement, these latter measures ranging from 79% to 100%. Mean frequencies for observed conflicts and *SE* were compared between language groups.

Results indicated that aberrant causes and physical harm accounted for a significant number of conflict causes for children with LI. Reconciliatory behaviors yielded no significant

differences between the coding categories, though male children with LI resolved conflicts with only verbal reconciliatory behaviors slightly less than typically developing participants.

The authors concluded that boys with LI resolved conflicts less and demonstrated inhibition in doing so in the post-conflict period. A larger percentage of conflicts also resulted from physical harm for children with LI. This study contributed to the current work by demonstrating conversational deficits of children with LI, specifically reconciliation deficits.

Liiva, C. A., & Cleave, P. L. (2005). Roles of initiation and responsiveness in access and participation for children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, 48, 868-883. doi:1092-4388/05/4804-0868.

The aim of this study was to determine the capacity of school-age children with SLI to access ongoing interactions with unfamiliar peers, the participation behaviors of these children following access, and the relationship between receptive and expressive language deficits to time of access and participation in ongoing interactions.

Study participants included a total of 69 children composing 23 triads. Each triad had 1 target child with SLI and 2 play partners that were matched for grade level and gender from schools in Atlantic Canada. The study procedure was for an investigator to bring play partners into a room and seat them on a rug with a toy set. The investigator then moved to a different part of the room for 10 minutes before leaving to retrieve the target child. This target child was instructed in the play context and then introduced immediately to the play partners, though this child was not told what his or her role would be. Children were allowed to ask for directions which the investigator replied to in a polite and minimal manner. The target child was permitted to attempt access for 10 minutes. These access and participation sessions were orthographically transcribed and coded for utterances addressed to target children, access episodes, partner

inclusion bids, group play, individual play, and onlooking behavior. Comparative analysis was carried out to determine the number of inclusion bids prior to access, the length of time needed for access either by responding or initiating, the length of time needed to gain access by initiation, and the percentage of intervals in which target children engaged in group play, individual play, or onlooking behaviors after access. The post-access number of utterances for each child and post-access number of utterances addressed to each child were assessed and compared.

The authors found that children with SLI generally achieved access through passive access responses rather than active initiation requests. Some received as many as 5 inclusion bids from partners prior to access. Children with the highest raw total language scores also took the least amount of time to gain access with expressive language capacities being most predictive of these successes. Conversely, receptive language skills were more predictive of target children advantage for interpreting access bids by their peers. After access, children with SLI talked much less than their typically developing peers and engaged in much more onlooking behaviors in the place of group play. This study contributed to the current work by describing access deficits as experienced by children with SLI as a challenge to social communication.

Merrison, S., & Merrison, A. J. (2005). Repair in speech and language therapy interaction:

Investigating pragmatic language impairment of children. *Child Language Teaching and Therapy*, 21(2), 191-211. doi:10.1191/0265659005ct288oa.

The aim of this study was to compare the conversational repair strategies of children with PLI, children with SLI, and children with typical language development.

Study participants for each of these three groups were between 7 and 11 years of age. All participants were asked to draw a route on a map based on conversation with a clinician. Both

the clinician and the participants had maps, though they were separated by a screen. The route drawing was accomplished by the participant following a series of 16 directions provided by the clinician. Opportunities for conversational repair were provided by the clinician giving inadequate instructions in 6 instances and by the differing landmarks found on the maps. Additionally, the group with PLI received six sessions of weekly intervention focused on asking when something was not understood, relating information to others, and checking to make sure information was understood. The group with SLI also underwent weekly intervention, though the focus was on language form rather than pragmatics. A different map was then used by study participants to assess changes in repair performance. Data was collected from the dialogues for the map task administered before and after intervention. Repairs were coded according to previous categorization schemes in the literature.

Results indicated greater success with the typical group and group with SLI in achieving an acceptable map route accomplished through appropriate and relevant questioning. The group with PLI demonstrated less success, though significant improvements were seen post-intervention. This study contributed to the current one by demonstrating the effectiveness of a social communication intervention on children with PLI.

Owens, R. E. (2004). *Language disorders: A functional approach to assessment and intervention* (4th ed., focus on chapter 1, pp. 3-17). Boston: Pearson.

The author of this book argued for a functional approach to language intervention for children with LI. After providing a basic definition of LI, the author contrasted traditional and functional therapeutic approaches to treating LI while positing that a functional pragmatic approach is best. The role of the therapist was discussed as a facilitator and consultant rather than as a direct service provider. Contextual factors and dimensions to language were elaborated

upon while obstacles to generalization were discussed. Specific variables affecting generalization were then discussed in detail including training targets, training items, methods of training, training cues, contingencies, and locations of training.

Redmond, S. M., & Rice, M. L. (1998). The socioemotional behaviors of children with SLI:

Social adaptation or social deviance? *Journal of Speech, Language, and Hearing Research*, 41(3), 688-700. doi:1092-4388/98/4103-0688.

The purpose of this study was to examine both teacher and parent ratings of sociobehavioral development for children with SLI in comparison to typically developing children matched for age.

Participants included 17 children with SLI and 20 age-matched children with typical language development that were recruited from another longitudinal study. Data were collected on these participants at approximately age 6 years and again at 7 years. Sociobehavioral measurements were carried out at these ages using the Child Behavior Checklist (CBCL; Achenbach, 1991) and Teacher Report Form (TRF; Achenbach, 1991) at the end of the academic year. Parents completed the CBC after reading through written directions while teachers were supplied the TRF in person.

The results of these measurements were analyzed using a series of univariate analyses of variance and chi-square analyses. Both analyses indicated that teachers rather than parents rated children with SLI as having significantly more social problems than their typically developing peers. Analysis also indicated that the severity of these teacher ratings was mitigated by the second measurement at 7 years of age, becoming similar to parent ratings. The authors also noted that children with SLI did not differ significantly from the typically developing children in the number of friends they had or time spent playing with them.

The authors concluded that children with SLI were much more like their typically developing peers than those with psychiatric disturbances, that teachers uniformly rated them as having more social problems than their typically developing peers, that little congruence or stability in ratings was seen between teacher and parent ratings when participants were examined on a case-by-case basis, and that these children did demonstrate some social competencies in certain circumstances as based upon parent ratings. This study contributed to the current work by presenting the social deficits and intermittent social strengths demonstrated by children with SLI.

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.

The purpose of this study was to determine the capacity of children with LI to infer emotions from specific social scenarios.

A group of 43 children with LI was matched by gender and age to a group of 43 typically developing children. Children were placed into either a younger or older group. In the younger group (11 boys and 10 girls), children were between 5 and 8 years of age; in the older group (12 boys and 10 girls), children were between 9 and 12 years of age. Participants were presented with social scenarios designed to elicit anger, fear, happiness, or sadness from the story protagonist, Chris. Participants were then asked to infer the inner emotional state of Chris and were provided pictured answer options to choose from. Open-ended questions were also employed to determine how children with LI described emotional experiences. Four scenarios were presented for each of the emotions targeted. Accuracy of participant answers for each

scenario was rated on a five-point scale (0 = no correct inferences; 4 = the emotion was correctly inferred in each scenario).

A four-way mixed model ANOVA was undertaken to determine how emotion identification differed across subject group, age, gender, and each emotion. Significant effects were found for emotion, age, and language factors while there was also a significant interaction between emotion and age. Open-ended questions were also evaluated for their appropriateness to story context with effects for tests of language found using a log linear analysis.

The authors concluded that children with LI had poorer emotion comprehension than typically developing age-matched peers. The authors also noted that while participants with LI could discuss emotions, they did so with an apparent lack of sophistication. The methods utilized in this study to determine if children with LI could identify emotions in a specific scenario were replicated in the current work.

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*, 23(6), 131-143.
doi:10.1177/15257401050260030201.

This study was dualistic in its aims: first, to determine the ability of children with LI to recognize emotions through facial expressions and second, to explore the capacity of these same children to recognize emotion in music. The article was consequently divided in design as if it were two separate studies.

In the first part, there were 43 children with LI age- and gender-matched to 43 children with typical language development. Participants were shown photographs (2 male and 2 female) demonstrating happiness, sadness, anger, fear, disgust, or surprise. Participants were instructed

to indicate the emotion expressed in the photograph using 6 emotion answer cards and 1 card designating that the answer was not known; these cards were vetted in a pilot study and were not found to add any further complexity to the task. Using these emotion answer cards, the participants were then shown the 24 photographs one at a time and asked to indicate which emotion was presented. Each emotion was presented with 4 photographs and responses were measured on a 5-point scale (0 = no emotions correctly identified; 4 = all emotions correctly identified). A four-way ANOVA was performed to examine how correctly identifying emotions differed across the language group, age, and gender of participants; patterns of confusion between emotions were also examined.

Results indicated that happiness, anger, and sadness were accurately identified more often than fear, disgust, and surprise for both language groups and that children with LI performed more poorly than children with typically developing language on the disgust and surprise photographs. Children with LI also confused distrust with anger and surprise with fear more often than their peers with typical language development.

The second part of the study included all the participants from the first part. These participants were presented with 20 s selections of classical music and asked to identify which emotion was being presented, though surprise and disgust were excluded because of the difficulty associated with their identification. As in the first part of the study, four answer cards representing the target emotions and one card representing that the child did not know the answer were provided. A consensus style scoring system was attempted in place of an objective approach for the music selections; in this sense, the typically developing children acted as a comparison group for the children with LI. These scores were put through a four-way ANOVA to determine differences across emotions, language groups, age groups, and gender.

Children with typical language development and older children had the highest ratings from the consensus group. Boys with LI had more agreement for excerpts demonstrating fear than did girls with LI; this relationship was reversed for agreement on excerpts demonstrating happiness. The group with LI as a whole appeared to confuse anger with fear.

Given these results, the authors concluded that emotion understanding and language are interrelated, putting children with LI at special disadvantage for social interactions. This study contributed to the current work by emphasizing the emotion understanding deficits associated with children with LI.

Timler, G. R. (2008). Social knowledge in children with language impairments: Examination of strategies, predicted consequences, and goals in peer conflict situations. *Clinical - Linguistics and Phonetics*, 22(9), 741-763. doi:10.1080/0269920082212470.

The motivation of this study was to identify if task structure affected performance in hypothetical tasks for children with LI, to determine if children with LI predicted consequences for their actions differently than typically developing children, and to explore the relationship between child performance on hypothetical tasks and ratings of social behaviors at home and at school.

There were 12 study participants with LI (age range = 8;4-12;2) and a group of 12 typically developing children (age range = 8;1-11;10) utilized as a control. The researchers first administered a training protocol with two vignettes, task questions, and responses to prepare participants for the study task. This study task was a hypothetical peer conflict that was presented under both open ended and forced choice conditions. A PowerPoint presentation was utilized to read and administer the 12 randomly presented peer conflict vignettes utilized in both conditions. Each of these vignettes was designed to have the same or similar sentence length,

number of words, grammatical complexity, and readability. Open ended conditions were presented before forced choice conditions for each child. In these open ended conditions, the researchers utilized a series of interview questions to elicit the participant's conflict resolution strategies. Immediately following this condition, the forced choice conditions were presented wherein participants were again read the vignettes and were asked what the best thing to do or say would be followed by 5 strategy category answer options. In addition to the study task just described, the mothers of participants were asked to complete the Social Skills Rating System (SSRS) and teachers were asked to complete the Social Skills Rating System—Teacher Edition (SSRS-TE) and the Taxonomy of Problematic Social Situations for Children (TOPS) for each participant. For the study task, interjudge reliability was 88.6% for strategy responses, 100% for predicted consequences of peer reactions, and 93.75% for goal statements. One-way repeated measures ANOVAs were utilized to examine group differences in prosocial strategies between the open ended and forced choice conditions. One-way ANOVAs were utilized in exploring group differences between the parent and teacher SSRS scores.

Results indicated that the group of children with LI produced fewer prosocial strategies than their typically developing peers while generating more adult-seeking strategies. Additionally, while none of the typically developing group chose a hostile strategy in the forced choice condition, 50% of the children with LI made such a choice. While parents of children with LI did not note differences in the Social Skills and Problem Behaviors sections of the SSRS, teachers rated these children lower in the former section and higher in the later. Teachers also rated the group with LI as having more problems according to the Response to Peer Provocation section of the TOPS.

The authors concluded that task structure (open ended and forced choice conditions) did not change the behaviors of children with LI, indicating that even when language demands were eliminated, these children had different social strategies than typically developing children. They also found that children with LI predicted fewer positive consequences for the open ended condition, a behavior that may have influenced the strategies they chose in dealing with peer conflicts. Finally, a correlation was found between selection of more prosocial strategies and better teacher ratings of social skills and peer provocation situations, while parent ratings did not appear significantly associated with this dynamic. This study contributed to the current work by discussing the prosocial and conflict resolution deficits found in the profile of children with LI.

Trauner, D. A., Ballantyne, A., Chase, C., & Tallal, P. (1993). Comprehension and expression of affect in language-impaired children. *Journal of Psycholinguistic Research*, 22(4), 445-452. doi:10.1007/BF01074346.

The purpose of this research project was to assess the ability of children with LI to comprehend and express affective intent verbally and non-verbally, tested in both the auditory and visual domains.

Participants were 8 children diagnosed with developmental LI (age range = 9.25-13.58 years) and 8 control children matched for age, gender, socioeconomic status, and IQ (age range = 8.67-12.42 years) with 5 boys and 3 girls in each group. Comprehension was tested in both the visual and auditory modalities. Assessment of comprehension for affective intent in the visual modality was accomplished by having children identify a set of 3 facial expressions (happy, sad, or angry) from photographs of the same woman. Auditory comprehension for affective intent was performed by having each participant listen to 15 short content neutral phrases spoken by a professional actress in either an angry, happy, or sad voice; participants were then asked to

indicate the emotion expressed by verbal response or by pointing to pictures of a woman expressing the same emotions. Two practice examples were administered to ensure that participants understood the instructions. Expression of affective intent in the visual modality was assessed by having participants produce the same facial expressions as those pictured by the woman in the photographs used in the comprehension tasks. Spontaneous expression in the visual modality was tested by asking participants to demonstrate with facial expression how they might feel given various scenarios. Auditory expression for affective intent was assessed by asking children to repeat verbally with the same intonation 15 phrases previously recorded by a professional actress. Participants received 2 practice examples to ensure their understanding of the task requirements. Spontaneous expression in the auditory modality was tested by having participants vocally finish 10 short stories. A total of 3 independent raters reviewed videotape of the recorded sessions and rated what emotions were produced (angry, happy, sad, or unable to determine) and the quality of each emotion produced (good, fair, or poor).

Results indicated that there were no difficulties in either the group with LI or control group in identifying emotions from photographs. Comprehension of affective intent in the auditory modality was significantly reduced for children with LI, as was spontaneous expression of affective intent in the auditory modality. Other tasks produced statistically similar results from the group with LI and control group. The authors noted qualitative differences in the performance of the group with LI such as very dramatic responses with the utilization of the body to convey emotions.

The authors concluded that children with LI did significantly poorer than control children in comprehension and expression of vocal affect and were more dramatic in expressing facial

affect. This study supports the current work by demonstrating some of the difficulties children with LI encounter in trying to interpret emotion.

Williams, D., Botting, N., & Boucher, J. (2008). Language in autism and specific language impairment: Where are the links? *Psychological Bulletin*, 134(6), 944-963.
doi:10.1037/a0013743.

The purpose of this study was to review and analyze the literature suggesting behavioral, neurobiological, and etiological links between children with ASD and children with LI.

The authors provided basic definitions for both ASD and LI while noting that both diagnoses include several subtypes. Shared etiological factors, linguistic profiles, neurobiology, and genetic markers were then cited as evidence that ASD and LI are closely related disorders. The linguistic profile of each disorder was reviewed along with cognitive markers for each. The authors found that linguistic profiles between children with LI and children with ASD depended in part upon the age of assessment. School age assessment showed children with LI had expressive and receptive difficulties while children with ASD had notable difficulties with comprehension and production of discourse with some impaired phonology and grammar. Despite these dissimilar linguistic profiles, areas of overlap were noted. Pre-school aged children with LI and children of the same age with ASD demonstrated significant overlap in their linguistic profiles. Overlap in so-called clinical marker behaviors was also seen in over half of children with LI and children with ASD, suggesting the possibility of shared or similar neurobiology. Impaired non-word repetition was noted as a firm marker for LI, though it was demonstrated that children with ASD also had poor non-work repetition capacities. As for overlapping neurobiology, the authors found that it could not conclusively explain an overlap in behaviors between children with LI and children with ASD. Finally, the authors note from

family studies that some aspects of LI appear to be heritable, while heritability for ASD was weaker when tested directly. Molecular genetic studies confirmed the heritability of LI traits while showing heritability for ASD, the latter finding contradicting the findings from the family studies.

The authors concluded that areas of language impairment in both LI and ASD should be focused on instead of overlapping areas of disorder. They reasoned that structural language impairments seen in ASD could not be adequately explained by comorbid LI. This study contributed to the current work by demonstrating linguistic similarities between children with LI and ASD.

Appendix B

Sample Lesson Plan

RESPONSIVENESS LESSON PLAN 3 (Lesson 3 BD&F)

Student Name: _____ Date: _____

Target Areas: 1) understanding facial expression 2) labeling emotion 3) inferring emotions that situations elicit 4) understanding differing emotions 5) responsiveness in interaction

Objective	Activities	Materials
1. Facial expression Labeling emotion Inferring emotion	Story and journal review Focus on a pre-selected scene showing contrasting emotions; example page 4 boy is happy and excited; the frog is worried or scared. Another example on page 16-17 boy is mad versus frog sad.	A boy, a dog and a frog Book, dog, frog, net, bucket, washcloth
1. Facial expression Labeling emotion Inferring emotion	Mind reading targeting happy/excited vs. worried/scared (from page 4); mad vs. happy (from page 16-17) Tie it into the child's personal experience. Act out facial expressions, "pretend such and such...how would you feel, show me how you look when you feel..." "show me how your face looks, I'll show you how my face looks".	Mind Reading program
2. Understanding differing emotions Inferring emotions	Role play with child a real life scenario What's for lunch? Conversation about things we like and things we don't like for lunch. Use a perspective chart to show that clinician and child like some things the same and some different. Highlight facial expressions. Spend time on what if scenarios (eg. What if you got worms?, what if I got jello and I hate jello). Pack each other's lunches according to perspective chart, likes and dislikes. Don't forget to role play packing lunch, opening lunch, eating together at lunch, etc. don't need to be long but need to be fun and emphasis responsiveness	Foods, paper bag, icky items, surprise items (both good and bad), scared items (like a bug), perspective chart
3. Journaling-all appropriate target areas for the activities	Highlight what we learned today. Highlight re: likes and dislikes from the lunch discussion.	Crayons and markers, journal,

Script for objective 1:

Introduce a boy, a dog and a frog

1. page one: Introduce characters

what is the boy holding, introduce boy/dog relationship (boy likes his dog), where are they going

2. page two: look at what the boy is doing, where is he looking,

3. page three: what does the boy see, what do you think he'll do, let's talk about what he might do?

4. page four and five: what is the boy doing, what is happening, how do the characters feel about it and why (e.g. page four: the boy is running to catch the frog, the boy is happy and excited, the frog is sad or worried because he doesn't want to be caught or because he doesn't want the boy to fall on him, page five: the boy is falling, he is surprised because he is falling, the frog is surprised because the boy is falling)

5. page six: what happened. How does the frog feel? How do the boy and the dog feel? Why do you think they feel the way they feel?

6. page six and seven: What has happened and how do they feel about it? Frog is not sad, he thinks it is funny. The boy feels (run with this a bit, the child can speculate).

7. page eight and nine: the boy is trying to catch the frog and the frog is trying to jump away because he is scared, afraid. He doesn't want to be caught. We don't know what the boy wants to do with the frog...
8. page nine: the frog got away and he is happy. How does the boy feel? (frustrated, this would be a good place to act it out or model frustrated) How can you tell?
9. page ten: now we can see the front of the boy, his face. The boy is angry. He is telling his dog what to do.
10. page eleven: the boy has a plan to catch the frog...discuss the plan. Will it work? What can happen?
11. page twelve and thirteen: what does the boy want to do? How does the frog feel? What happens? Was this the plan? Is this what the boy wanted?
12. page fourteen and fifteen: look at together. how does the boy feel, the dog feel and the frog feel and why?
13. page sixteen and seventeen: look at together. What is the boy doing? Waving goodbye or does he have his fist in the air? (fist in air). What do you think he is going to do? How does the frog feel about that?
14. page eighteen and nineteen: look at together: the boy and dog are going home. The frog feels sad because the dog and the boy are going home.
15. page twenty and twenty one: the boy is going home. The boy is sad or mad or disappointed because he did not catch the frog. How does the dog feel?
16. page twenty-one and twenty-two: look at together: the frog is alone. How does the frog feel, how does he look? He is sad because he is lonely. The frog misses the boy and the dog. Maybe the frog had fun with the boy and the dog.
17. page twenty-three and twenty –four: look at together, the frog is following the boy and the dog. The frog goes into the house because he is looking for the boy and the dog.
18. page twenty-five: the boy is taking a bath with the dog.
19. page twenty-six: look who comes into the bathroom. How does the frog feel? The frog is happy because he sees the boy and the dog.
20. page twenty-seven: the boy sees the frog. How does the boy feel? He is happy because the frog has followed him home.
21. page twenty-eight: the frog jumps in the bath. The boy and the dog are surprised and happy that the frog has joined them.
22. page twenty-nine: the boy, the frog and the dog are all together. They are happy because they are all together.

Appendix C

Sample Inference Chart

Characters	When	Feeling	Why
Boy			
Dog			
Frog			
Turtle			