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# The Effects of a Social Communication Intervention on the Correct Production of Emotion Words for Children with Language Impairment

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The Effects of a Social Communication Intervention on the Correct Production of  
Emotion Words for Children with Language Impairment

Julia Vincent Hetherton

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 Effects of a Social Communication Intervention on the Correct Production of Emotion Words for Children with Language Impairment

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Master of Science

Many school-age children with language impairment (LI) have difficulties with aspects of social and emotional learning. This study was structured to evaluate one aspect of the effectiveness of a social communication intervention, the appropriate production of emotion words. Four school-aged children with LI participated in 20 sessions of story-based intervention targeting understanding and usage of emotion-based words. Emotions targeted included the emotion word categories of *happiness*, *sadness*, *anger*, *fear*, *surprise*, and *disgust*. Because the knowledge of the emotion word categories varied from child to child, each child had different target words. The percentage of correct production of targeted emotion word categories was tracked, recorded and presented in figure format. The percentage of correct productions provided an estimation of the participants' usage and understanding of emotion-based words from session to session. Percentage of nonoverlapping data (PND) for each participant (subdivided by emotion) was calculated where appropriate as one measure of the effectiveness of the intervention. Although somewhat variable, the data showed that the children did make progress in their use of some of the emotion word categories that they did not understand at baseline. The results of the study present some promising preliminary findings.

Keywords: language impairment, social communication intervention, emotional intelligence, emotion understanding, emotional competence, school-age children, emotion-based words

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## TABLE OF CONTENTS

TITLE .....	i
ABSTRACT.....	ii
ACKNOWLEDGMENTS .....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
LIST OF APPENDICES .....	viii
DESCRIPTION OF THESIS CONTENT .....	ix
Introduction.....	1
Emotional Intelligence and LI.....	2
Social Communication Intervention for Children with LI .....	8
Purpose of the Current Study .....	9
Method.....	9
Participants.....	9
ZY (11:0 years: months). .....	10
XW (10:2). .....	12
VU (9:11). .....	13
RQ (5:10). .....	14
Procedures.....	14
Baseline.....	15
Intervention.....	15
Analysis.....	16
Results.....	18
ZY .....	19
XW.....	21
VU.....	22
RQ.....	23
Discussion.....	25
Individual Findings .....	26
ZY .....	26
XW.....	28
VU.....	28
RQ.....	29

General Implications .....	30
Limitations of the Study .....	31
Directions for Future Research .....	32
Conclusion.....	33
References.....	34

## LIST OF TABLES

Table	Page
<i>Table 1.</i> Children's Communication Checklist-2 (CCC-2; Bishop 2006) and Clinical Evaluation of Language Fundamentals-5 (CELF-5; Semel et al., 2013) Scores .....	11

## LIST OF FIGURES

Figure	Page
<i>Figure 1.</i> Percentages of Correct Production for Anger-, Surprise-, and Sadness-based Words by ZY Per Session .....	20
<i>Figure 2.</i> Percentages of Correct Production for Disgust-based Words by XW Per Session.....	21
<i>Figure 3.</i> Percentages of Correct Production for Surprise-based Words by VU Per Session.....	23
<i>Figure 4.</i> Percentages of Correct Production for Anger-, Sadness-, and Happiness-based Words by RQ Per Session .....	24



## LIST OF APPENDICES

Appendix	Page
Appendix A: Annotated Bibliography .....	40
Appendix B: Clinical Evaluation of Language Fundamentals-5 (CELF-5) .....	56
Appendix C: Emotion Word Coding Manual .....	57
Appendix D: Consent to Take Part in Research .....	61

## DESCRIPTION OF THESIS CONTENT

This thesis, *The Effects of a Social Communication Intervention on the Correct Production of Emotion Words for Children with Language Impairment*, is part of a larger research project, and all or part of the data from this thesis may be published as part of articles listing the thesis author as a co-author. An annotated bibliography is presented in Appendix A, Appendix B contains the results of the Clinical Evaluation of Language Fundamentals-5 (CELF-5) administered to the participants, and Appendix C contains the emotion word coding manual used to ensure interrater reliability. Research participation consent forms are included in Appendix D.

## Introduction

Language impairment (LI) is defined as “a significant deficit in language ability that cannot be attributed to hearing loss, low nonverbal intelligence, or neurological damage” (Leonard, 2014, p. 3)<sup>1</sup>. As many as 7% of kindergarteners have LI (Tomblin et al., 1997), making it, “the most prevalent disorder that the person on the street has never heard of” (Leonard, 2014, p. vii). Although LI is characterized by deficits in syntactic and semantic development, recent studies have shown that these children may also have notable deficits with aspects of social communication.

Communication is inherently social. However, the term social communication extends beyond the boundaries of this general observation. Social communication has been described as “the synergistic emergence of social interaction, social cognition, pragmatics (verbal and nonverbal), and receptive and expressive language processing” (Adams, 2005, p. 182). In her later work, Adams has focused on three general areas that work together to produce successful social communication: social understanding and interaction, language processing, and pragmatics (Adams, Lockton, Gaile, Earl, & Freed, 2012). Each of these areas is briefly described as follows.

Social understanding includes social cognitive behaviors such as theory of mind, emotional intelligence, and executive functioning, all of which are critical to the ability to correctly interpret social information. Social interaction involves intersubjectivity (the recognition of others as social beings), empathy, and attachment (Adams, 2005). Language processing involves the structural aspects of language, including linguistic form and content. These aspects include the production of syntax and vocabulary, as well as comprehension of

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<sup>1</sup> The terms language impairment and specific language impairment (SLI) are used interchangeably in this paper.

language at the discourse level and sequencing discourse during the production of language (Adams, 2013; University of Manchester, n.d.). Pragmatics “refers to a group of behaviors that are concerned with how language is used to convey meanings” (Adams, 2002, p. 973). This can include turn taking in conversation, using verbal and nonverbal signals, facial expression, and eye contact (Timler, Olswang, & Coggins, 2005).

Children with LI have difficulty with language processing (Bishop, 2006b; Briscoe, Bishop & Norbury, 2001; Conti-Ramsden 2003). Problems with syntax, morphology, and semantics are considered defining characteristics of LI. Additionally, there is evidence that some of these children have difficulties with pragmatic behaviors (Bishop, Chan, Adams, Hartley, & Weir, 2000; Brinton, Spackman, Fujiki, & Ricks, 2007; Gerber, Brice, Capone, Fujiki, & Timler, 2012; Spackman, Fujiki, Brinton, Nelson, & Allen, 2005). More recently, there is increasing evidence that children with LI have difficulty with aspects of social understanding and interaction. One particular area, emotional intelligence, is of particular concern. Studies examining emotional intelligence in children with LI are reviewed in the following section.

### **Emotional Intelligence and LI**

Emotional intelligence is “the ability to perceive and express emotions, to understand and use them, and to manage emotions so as to foster personal growth” (Salovey, Detweiler-Bedell, Detweiler-Bedell, & Mayer, 2008, p.535). Recently, there is increasing evidence that children with LI have difficulty with aspects of emotional intelligence; including emotion regulation, emotion perception, and emotion understanding (Merkenschlager, Amorosa, Kiefl, & Martinius, 2012; Brinton et al., 2007; Brinton, Fujiki, Hurst, Jones, & Spackman, 2015; Ford & Milosky, 2003; 2008; Spackman et al., 2005; Taylor, Maybery, Grayndler, & Whitehouse, 2015). In the following review, I consider studies that examine each of these areas.

**Emotion regulation.** Regulating emotion can involve either moderating or elevating emotions (Thompson, 1994). A number of researchers have demonstrated that language is important to emotion regulation (e.g., Cole, Armstrong, & Pemberton, 2010), thus it is not surprising that children with LI would have difficulty regulating emotions. Using the Emotion Regulation Checklist, Fujiki, Brinton, and Clarke (2002) found that classroom teachers rated elementary school-age children with LI as being less able to regulate their emotions than typically developing peers.

In 2004, Fujiki, Spackman, Brinton, and Hall examined the social impact of emotion regulation skills in children with specific language impairment (SLI). These researchers examined the contributions of language and emotion regulation to the reticent behavior observed in children with SLI. Using a regression analysis, the authors found that “the emotion regulation scores and the CASL scores were significant predictors of the reticence scores, accounting for 43% of the variance” (p. 637). These researchers demonstrated that emotional regulation played an important role in the reticence observed in children with SLI. These findings supported the idea that aspects of emotional intelligence were influential in the social outcomes observed in children with language difficulties.

**Emotion perception.** Difficulty with basic aspects of emotional intelligence in children with LI also extends to the ability to correctly interpret emotions conveyed by way of prosody, facial expression, and gesture. For example, several investigators have considered the ability of children with LI to interpret the emotion conveyed by prosody. Most studies examining prosody with these children have used short stimuli, such as individual words or short phrases spoken to convey a particular emotion (Alt, Plante, & Creusere, 2004; Berk, Doehring, & Bryans, 1983; Courtright & Courtright, 1983; Trauner, Ballantyne, Chase, & Tallal, 1993). Although somewhat

equivocal, these studies have shown that children with LI are not as effective at identifying emotion conveyed by prosody as typically developing children.

Although short stimuli reduce the potential influence of confounding linguistic variables, they also provide a relatively artificial context. Taking a different approach, Fujiki, Spackman, Brinton and Illig (2008) provided children with a stimulus with more context by using a seven-sentence long passage, read to convey different emotions (e.g., happiness & sadness). In this study, children with LI and their peers were presented with the same passage, read to convey four basic emotions (happiness, anger, sadness & fear). Children with LI had significantly more difficulty identifying the emotion expressed than their typical peers.

Children with LI also have more difficulty identifying emotions in facial expression and gesture than children with typical language (Merkenschlager, Amorosa, Kiefl, & Martinus, 2012; Spackman et al., 2005; Taylor, Maybery, Grayndler, & Whitehouse, 2015). For example, Spackman et al. found that children with LI performed more poorly than typical peers in the identification of more complex emotions (i.e., surprise & disgust). Taylor et al. found that children with LI differed from typical children on complex and simple emotions (i.e., happy, sad, scared, & angry). An interesting aspect of the Taylor et al. study was that children with autism spectrum disorder were also included and were subdivided into two groups: those with normal language skills and those with impaired language skills. These researchers found that children with a diagnosis of autism spectrum disorder and typical language were more accurate at identifying the conveyed emotions than their peers with autism spectrum disorder and impaired language. Taylor and colleagues stated, “the results indicate that children with ALI (impaired language and autism spectrum disorder) and children with SLI share emotion recognition

deficits, which are likely to be driven by the poor language abilities of these two groups” (p. 452). This further suggests a connection between language abilities and emotional intelligence.

In an attempt to present stimuli in conditions more similar to an actual interaction, Merkschlager et al. (2012) used a movie to show facial expressions and gesture expressions. Children with LI scored significantly worse than their typical peers when identifying emotions from both facial expressions and gesture expressions.

The previously mentioned study by Spackman et al. (2005) sought to measure emotion understanding with a task that minimized language demands. Their study design accomplished this by having children ranging in age from 5 to 12 years listen to excerpts of classical music and identify the emotion expressed. Children with LI had more difficulty identifying the correct emotion than children with typical language skills, particularly the emotions anger and fear. Spackman et al. submitted that their “results suggest that language and emotion understanding cannot be viewed as independent of one another. Language contributes to emotion understanding, and emotion understanding contributes to the social use of language” (p. 142.).

**Emotion understanding.** Saarni (1999) defined emotion understanding as the “ability to discern and understand others’ emotions, using situational and expressive cues that have some degree of cultural consensus as to their emotional meaning” (p. 106). Emotion understanding includes behaviors that are more sophisticated and require more complex processing than emotion perception. Deficits in the emotion understanding of children with LI are found across many stages of childhood. Ford and Milosky (2003) found that preschool children with LI demonstrated lower emotion understanding skills than preschool children with typical language. These researchers examined the ability of kindergarten children with LI and their typical peers to infer the emotions experienced by a character in a short scenario. These researchers first asked

participants to label emotion faces and point to the correct face when given a label. Both groups of children completed this task without problem, thus demonstrating that these children could both understand and produce basic emotion labels. Children were then asked to infer the emotion a character would experience based on short scenario (e.g., Twinky loves balloons, Twinky gets a balloon. Twinky is \_\_\_\_). Finally, participants were then asked to point to the picture of the emotion the character would feel. Children with LI were more likely to give the wrong emotion. Additionally, “children in the group with LI were more likely to provide emotions of a different valence (e.g., substituting happy for mad) than were children in the CA (age-matched) group” (p. 21). Although the children with LI demonstrated basic emotion knowledge, they were unable to make simple inferences regarding the emotion that a character in the story might experience.

Spackman, Fujiki, and Brinton (2006) used the same methodology as Ford and Milosky (2003), but with older children. Eighty-six children (43 with LI and 43 typically developing children) participated. These children were further divided into two age groups: 5 to 8 years of age and 9 to 12 years of age. Spackman and colleagues replicated Ford and Milosky’s findings in that the children with LI were less accurate at inferring the experienced emotion than typically developing children. Additionally, children with LI used less sophisticated descriptions of the emotions than their typically developing peers.

Children with LI also appear to undervalue the impact that displaying an inappropriate emotion would have on a relationship. Studies have shown that children with LI are less likely to hide a socially inappropriate emotion than children with typical language (Brinton et al., 2007; Brinton et al., 2015). Brinton et al. (2007) found that children with LI had more difficulty than typical peers judging when to dissemble (or conceal) an emotion that would be perceived as inappropriate to display according to social display rules. Brinton et al. asked children to answer



questions about a hypothetical situation (e.g., Chris wants a cowboy costume for Halloween. Chris's grandma makes a dinosaur costume for Chris. What should Chris say?). Both children with typical language and children with LI understood the social display rules (i.e., what the expected response would be), but the children with LI seemed to underestimate the negative impact displaying these emotions would have on relationships since they often displayed those emotions anyway.

In a similar study, Brinton et al. (2015) extended the scope of Brinton et al. (2007) by examining both hypothetical situations and natural situations. Results for hypothetical situations replicated the findings of the earlier study. Results for natural situations were more nuanced. In low-cost situations (i.e., the consequences of displaying the emotion are minimal for the child) there was little difference between typical children and children with LI. In high-cost situations (i.e., the consequences of displaying an emotion are higher), the results neared statistical significance (.058) between the two groups of children. Children with LI were less likely to dissemble negative emotions in those situations. The results of these studies are related to the previously discussed general deficit in understanding how another person might feel in a given situation.

The research cited above suggests that children with LI have difficulties with aspects of emotion perception, emotion understanding, and emotion regulation. Because of the critical role that these skills play in social interaction, it seems likely that poor emotional intelligence contributes to the social difficulties that these children experience. This in turn supports a need for further research into intervention strategies for this population that would target limitations in emotional intelligence.

## **Social Communication Intervention for Children with LI**

In light of the persistent emotional intelligence deficits that children with LI experience, intervention targeting aspects of this behavior could be beneficial. However, only a few studies have addressed the efficacy of interventions designed to address social communication in children with LI. Illustrative of this point, an ad hoc committee of the American Speech-Language-Hearing Association conducted a systematic review of the literature addressing social communication interventions between 1975 and 2008. The review focused on children with LI between the ages of 5 and 11 years. In the date range specified, only eight intervention studies were identified that were of high enough quality to be considered in the review. Only one of these studies addressed aspects of emotional intelligence (Gerber et al., 2012). The ad hoc committee called for further investigation into the efficacy of interventions that focus on children's language use in social interactions. Since then, additional studies addressing social communication interventions in this age range have been completed (e.g., Adams et al., 2012; Fujiki, Brinton, McCleave, Anderson, & Chamberlain, 2013). Of particular note, Adams et al. evaluated the effectiveness of a manualized social communication intervention for children with pragmatic language impairment (PLI) to increase language, pragmatic and social communication skills. The elementary school-aged children that participated in the study were assessed preintervention, immediately postintervention and at a 6-month follow-up. The results indicated that the intervention did not differ from traditional treatment effects for structural language ability or narrative ability. However, there were significant improvements in conversational competence, pragmatic functioning, and social communication and classroom learning skills as measured by the assessment tools selected. Adams et al. stated, "The implications are that, with carefully targeted specialist intervention, there is potential for some change in some school-aged

children who have persistent pragmatic and social communication needs, even with a brief period of speech and language therapy” (p. 242). This is an important start, but given the range of behaviors falling within the realm of social communication, there is considerably more work to be done.

One area that merits investigation is the efficacy of targeting emotion word usage in children with LI. Multiple studies show that children with LI have difficulty with vocabulary words in general (Hick, Botting, & Conti-Ramsden, 2005; McGregor, Newman, Reilly, & Capone, 2002; McGregor, Oleson, Bahnsen, & Duff, 2013). Given deficits in basic aspects of emotion perception and understanding reviewed previously, it may be advantageous to address both limited vocabulary and emotion understanding simultaneously by using an intervention that focuses on increasing children’s knowledge of emotion words.

### **Purpose of the Current Study**

The purpose of this study was to evaluate one aspect of a social communication intervention for children with LI designed to increase the appropriate production of emotion words. The following question was asked:

1. Will an intervention using a story enactment methodology increase the accuracy of emotion words produced by children with LI?

### **Method**

#### **Participants**

Participants in the intervention were chosen through the assistance of the speech language pathologist at an elementary school in the western United States. To determine which children could participate in the study, the speech language pathologist reviewed all caseload files and identified children receiving services for LI who also displayed deficits in social communication.

Once eligible children were selected, the speech language pathologist contacted parents to determine their interest in having their children participate. Parents who were interested provided the speech language pathologist and researchers with written permission for their child to be involved in the study. The consent form is included in Appendix D. Next, the researchers administered standardized testing, conducted informal assessments and probes, and then began treatment. All intervention administered by the researchers was coordinated with the school speech language pathologist to ensure that the services provided were aligned with current Individualized Education Program (IEP) goals. A description of each participant is presented below. Initials have been changed to protect the identity of the participants.

All children in the study passed a pure tone hearing screening by the school district audiologist or speech language pathologist. In addition, intellectual disability was excluded for all participants by the school psychologist. It should be noted that a history of attention deficit disorder was not exclusionary.

Standardized measures of language were administered to each participant by a graduate student in speech-language pathology. The Clinical Evaluation of Language Fundamentals-5 (CELF-5; Semel, Wiig, & Secord, 2013) was used to determine a core language score for each of the children, and the Children's Communication Checklist-2 (CCC-2; Bishop, 2006) was administered to document social communication difficulties. The results of these measures are presented in Table 1. The subtest scores for the CELF-5 are included in Appendix B.

**ZY** (11:0 years: months). ZY was a Caucasian female with a diagnosis of specific learning disorder (SLD) and LI. From kindergarten to second grade, ZY attended a mainstream classroom with pull-out resource services provided. In third grade, ZY was placed in a small-group classroom for children with learning disabilities in order to receive more individualized

**Table 1**

*Children's Communication Checklist-2 (CCC-2; Bishop 2006) and Clinical Evaluation of Language Fundamentals-5 (CELF-5; Semel, Wigg, & Secord, 2003) Scores*

Instruments	Participants				
	MG	KJ	PW	JS	VA
CCC-2 <sup>1</sup> Subtests					
Speech	1	<1	<1	25	1
Syntax	25	<1	16	50	2
Semantics	5	5	5	50	1
Coherence	1	37	9	9	<1
Initiation	37	2	50	37	9
Scripted Language	25	50	25	37	9
Context	16	16	9	25	5
Nonverbal Communication	5	5	9	16	<1
Social Relations	5	2	5	1	<1
Interests	37	50	25	37	5
GCC <sup>2</sup> percentile	5	3	6	23	<1
SIDI <sup>3</sup>	9	7	9	-6	1
CELF-5 <sup>4</sup>					
Core Percentile	4	2	9	9	5

*Note.* <sup>1</sup>Children's Communication Checklist-2 (CCC-2). <sup>2</sup>General Communication Composite. <sup>3</sup>Social Interaction Difference Index. <sup>4</sup>Clinical Evaluation of Language Fundamentals-5 (CELF-5).

At the time of the study, she attended a mainstream fifth grade class and continued to receive self-contained resource and speech-language services on a pull-out basis. Her speech and language goals were centered on helping her participate effectively in social conversations and collaborations with others in addition to expressing her own thoughts and ideas clearly. ZY's scores on the CCC-2 indicated difficulty in nonverbal communication and social relations, as well as the structural areas of speech, semantics, and coherence. Her core score on the CELF-5 was in the 5th percentile.

ZY's clinician described her as having solid communication skills at a basic conversational level; however, she struggled to provide clarifying details when asked follow-up questions. She also had difficulty with social inferencing associated with higher level

communication. When ZY was required to discuss topics outside of the here and now, she compensated by dominating the conversation. The clinician also indicated that ZY had difficulties picking up on social cues and nonverbal aspects of communication. ZY's teacher commented that ZY was motivated to interact with others and was cooperative, helpful, and well-mannered in class; however, her deficits in language skills caused her to sound immature compared to children her age.

**XW (10:2).** XW was a Caucasian male who began receiving special education services at the age of 6:2 due to a diagnosis of LI. Four months later, at the age of 6:6, XW was diagnosed with SLD and started receiving special education serves for reading, writing, and math. XW continued to receive resource services while attending a mainstream fourth grade class. Speech and language services at school included intervention for both articulation and language. The clinician administered the CELF-5 to XW. His core language score on that test was in the 2nd percentile. XW's scores on the CCC-2, uncovered deficits in both structural/vocabulary skills and pragmatic language skills. Pragmatically, XW scored poorly in initiation, nonverbal communication, and social relations. Structurally, XW's scores fell below the 6th percentile, revealing difficulties with speech, syntax, and semantics.

XW's school clinician reported that XW's social conversations were often one-sided and off topic. He had difficulty maintaining conversations if the topic was introduced by others and did not interest him. The clinician also remarked that XW demonstrated little to no ability to read social cues, struggled with social inferencing, and had significant difficulty appreciating the perspectives of others. XW's teacher commented that he demonstrated poor classroom behavior as evidenced by difficulty staying on task and being aware of his own inappropriate behavior. He often acted impulsively. Fellow students were often assigned to assist XW with classroom tasks

and to help him monitor his behavior. Additionally, his mother reported that XW showed a short attention span, was easily overstimulated in play, overreacted when faced with problems, and lacked self-control at home.

VU (9:11). VU was a Caucasian male diagnosed with LI and previously diagnosed with attention deficit disorder (ADD). A school-based evaluation at age 9:1 resulted in a diagnosis of SLD which qualified VU for special education resource services for reading and math. During the study, VU attended a mainstream fourth grade class with pull-out resource services in math and reading (three hours maximum a week). He also received speech-language services. His goals focused on articulation, resonance, and language. His pragmatic language scores on the CCC-2 suggested deficits in the following subtests: context, nonverbal, and social relations. VU also had difficulties with the structural aspects of speech and language. His scores for semantics were in the 5th percentile, coherence scores were in the 9th percentile, articulation scores were below the 1st percentile. VU's CELF-5 core language score was in the 9th percentile, supporting the results of the CCC-2.

The clinician reported that VU made progress and matured in his communication skills over the past year, however, he was still a relatively passive conversational interactant. VU appeared to have difficulty initiating conversations with both adults and peers and often allowed others to dominate the conversation. When he did contribute to a conversation, he was often off topic or used compensatory methods such as laughter to make up for his deficits in language skills. Similarly, VU's teacher and mother stated that he liked being around other children, but had difficulty starting interactions. They also noted that he had difficulty following directions and they often had to ask him multiple times to finish a simple task.

**RQ (5:10).** RQ was a Caucasian male. Before the age of 3 years old, an early childhood assessment center evaluated RQ's need for special education services. The assessment results revealed that he presented with significant delays in social/emotional development and expressive/receptive language which qualified him for enrollment in a special-needs preschool. RQ was diagnosed with LI and SLD after a reevaluation at age 5:4. These diagnoses qualified him for special education services in the areas of math, writing, occupational therapy, and speech-language services. Additionally, RQ received a medical diagnosis of ADHD. RQ received scores in or below the 9th percentile on every subtest on the CCC-2. His CELF-5 core language score was in the 5th percentile. His communication services included both articulation and language goals.

RQ's clinician reported that he often experienced difficulty expressing himself due to semantic deficits and syntax/morphological errors. He had trouble participating appropriately in natural communication exchanges. RQ's communication was often self-focused and one-sided. His attention span was limited, and he often needed redirection to finish speech tasks. RQ's teacher noted that RQ demonstrated some prosocial behaviors but would exhibit them at inappropriate times. He also had trouble engaging in instruction, staying on task, and maintaining appropriate classroom behavior. RQ expressed interest in engaging with other children but he was often impulsive and would initiate interaction through rough play or other socially negative behavior. RQ's mother noted that he had trouble interpreting facial expressions and nonverbal cues and struggled to respond appropriately to others' emotions.

### **Procedures**

The intervention was administered by a graduate student clinician under the supervision of the school speech-language pathologist. The project was overseen by two university-based



doctoral level speech-language pathologists who specialized in clinical research involving children with LI.

The treatment activities were designed to incorporate each child's IEP goal for social language intervention (Adams et al., 2012; Fujiki et al., 2013). Treatment sessions used children's books to introduce and practice aspects of emotion understanding. Each participant met with the student clinician two times per week for 20 minutes for a total of 20 treatment sessions. All sessions took place in a quiet room at the child's elementary school. Each session was video and audio recorded for later analysis.

**Baseline.** A single-case study design was implemented for this thesis. Three tasks measuring emotion perception and emotion understanding were administered across three or six sessions as a baseline. These tasks were given again immediately after the intervention in three sessions. Additionally, the Teacher Behavior Rating Scale (TBRS; Hart & Robinson, 1996) was administered pre and posttreatment to provide an assessment of social competence. To align with the purpose of this study, a shorter 79-item version that focused on questions related to sociability and withdrawal was used.

**Intervention.** The four participants met individually with the student clinician. Each session consisted of three activities: story sharing, story enactment, and journaling. Story books that contained rich emotional content, strong story structure, and manageable language were selected. A flexible script was created for each story. In the script, concepts to be emphasized were identified. These concepts included emotion knowledge (words, sources of emotion, etc.), prosocial behaviors, and language structures (e.g., complex sentence structures linking emotions to sources).

Story sharing occurred every time a new book was introduced in a session. Story sharing involved the clinician reading and discussing a storybook with the child. During story sharing, the clinician followed a flexible script that included probes to highlight specified emotion concepts and words, prosocial behaviors, and structural elements (complex sentences). After reading the story, the child and clinician participated in story enactment which consisted of using stuffed animal toys and other relevant objects to enact the story while delineating each character's emotions and perspectives. Each child was given the opportunity to choose which characters they wanted to enact. After the first enactment, the roles were switched.

Lastly, a journaling activity was used to review the story and highlighted emotions, strengthen the main points learned, and help the children relate the story to their own experiences. The activities used were developed to facilitate social and emotional learning, promote specific prosocial behaviors, and encourage participation in group interactions. All activities were designed to be accessible to children with impaired language abilities. Likewise, presentation of the stories was designed to include modeling of complex sentence forms in order to promote increased development of structural language skills.

### **Analysis**

Video recording of the session was transferred from the recording device, to a computer to be analyzed by research assistants. Assistants coded each session using a formatted paper. The correct production of emotion words by the participants was analyzed to determine the effect the intervention had on their use of emotion words. Each emotion-based word used by the participant during the sessions was coded into one of six emotion categories: *happiness*, *sadness*, *anger*, *surprise*, *fear*, and *disgust*. Occasionally, a word used by a participant would not fit into one of the six categories (e.g. "jealous"), in which case it was put into a category labeled "other."

When a participant produced an emotion word, other categories of information were recorded along with the actual word produced and its emotion category to assist in determining if it was used appropriately. This additional information included “Target and Production Match.” If the emotion word produced by the child fit into the emotion category that the clinician was targeting, then this category received a plus mark. If the emotion word produced by the child did not match the emotion category targeted by the clinician, then a minus mark was put in the category and the appropriate category was recorded. The time of production was noted and the type of production was noted. Type of production described the circumstances under which an emotion word was produced (spontaneously, cued, question, or repetition/imitation). “Valence” was another coding category. The valence of the produced emotion word was marked correct if the word produced matched the valence of the intended word. Words produced of a different valence as the intended word were marked as having an incorrect valence (e.g., saying “happy” instead of “sad” is incorrect valence because the two have opposite valence; saying “mad” instead of “sad” is correct valence because the two have the same general valence.) The use of categories was designed so as to allow for flexibility in the production of emotion-based words. For example, “mad,” “frustrated,” “grumpy,” and “furious” would all be coded in the category of “anger.”

The baseline, intervention, and follow-up sessions were analyzed for percentage of correct production of emotion-based words. This was accomplished by taking the number of correct productions of an emotion category and dividing it by the number of times that category was targeted. The intervention sessions utilized a variety of tasks and storybooks, however, the baseline and follow-up sessions used the same tasks so as to have a comparable data set.

Three research assistants coded emotion words from the video and audio recordings. These researchers were trained on how to code using an emotion word coding manual (see

appendix C). To establish coding reliability, assistants were given ten recordings to code. Their coding was then compared to a master coding of those same recordings. All of the assistants' coding agreed with the master coding by at least 92%.

### Results

For each session, the percentage of correct production of emotion-based words produced was calculated according to the categories of emotion words that were targets for each participant. Emotion words were drawn from the following six categories: *happiness*, *sadness*, *anger*, *fear*, *surprise*, and *disgust*. For the purposes of this study, each participant's results were examined individually. The children showed a high degree of proficiency for some emotion words in baseline and these words were not specifically targeted in the intervention. The percentage of correct production of targeted emotion word category for each participant, by session, is presented in Figures 1 through 4. The percentage of correct production provided an estimation of the participants' usage and understanding of emotion-based words from session to session. The percentage of nonoverlapping data (PND) for each participant was calculated as one measure of the effectiveness of the intervention. The PND is one way to evaluate the effectiveness of a single case study design. It is calculated by determining the highest data point in baseline. Then each data point in intervention and follow-up that exceeds that highest baseline point is added. This number of nonoverlapping intervention and follow-up points is divided by the total number of data points (Schlosser, Lee, & Wendt, 2008). For the purposes of this study, the PND results were interpreted as highly effective if they fell between 91% to 100%, moderately effective if they fell between 71% to 90%, minimally effective if between 50% to 70%, and not effective if below 50%.

Not every emotion was produced by the participants in every session. If an emotion was not produced at all during a session, then a break in the data line appears in the graph. The graphs were presented in this manner to illustrate the difference between no productions of a particular emotion category and no correct productions of a category.

The total number of productions of an emotion category per session is included in the figures and is represented by a number above the session point on the graph. The total number of productions gives additional insight into the percentage of correct production for each session. A percentage of correct production of 100% based on 15 productions is more meaningful than a percentage of correct production of 100% based on one production.

## ZY

Of the six categories of emotion words, *happiness*, *fear*, and *disgust* are not reported because baseline data suggested that ZY had an appropriate level of knowledge for these word categories. *Anger*, *surprise*, and *sadness* were tracked and appropriate performance is reported in Figure 1. Increases in percentage of correct production were seen in the emotion-based categories of *anger* and *surprise*. Percentage of correct production of the category of *sadness* started low in baseline, increased during the intervention, and then were low again at follow-up. Performance on this category was generally inconsistent, with performance varying markedly from session to session. The PND for *anger* was 75%, indicating that the intervention was moderately effective for that emotion category for ZY. *Sadness* produced a PND of 48% indicating that the treatment was ineffective for that emotion category. The PND for *surprise* was 0% due to one baseline session having 100% correct productions. However, this percentage was based on only one production. Many of ZY's erroneous emotion-based word productions stemmed from confusion over the word category of *surprise*.

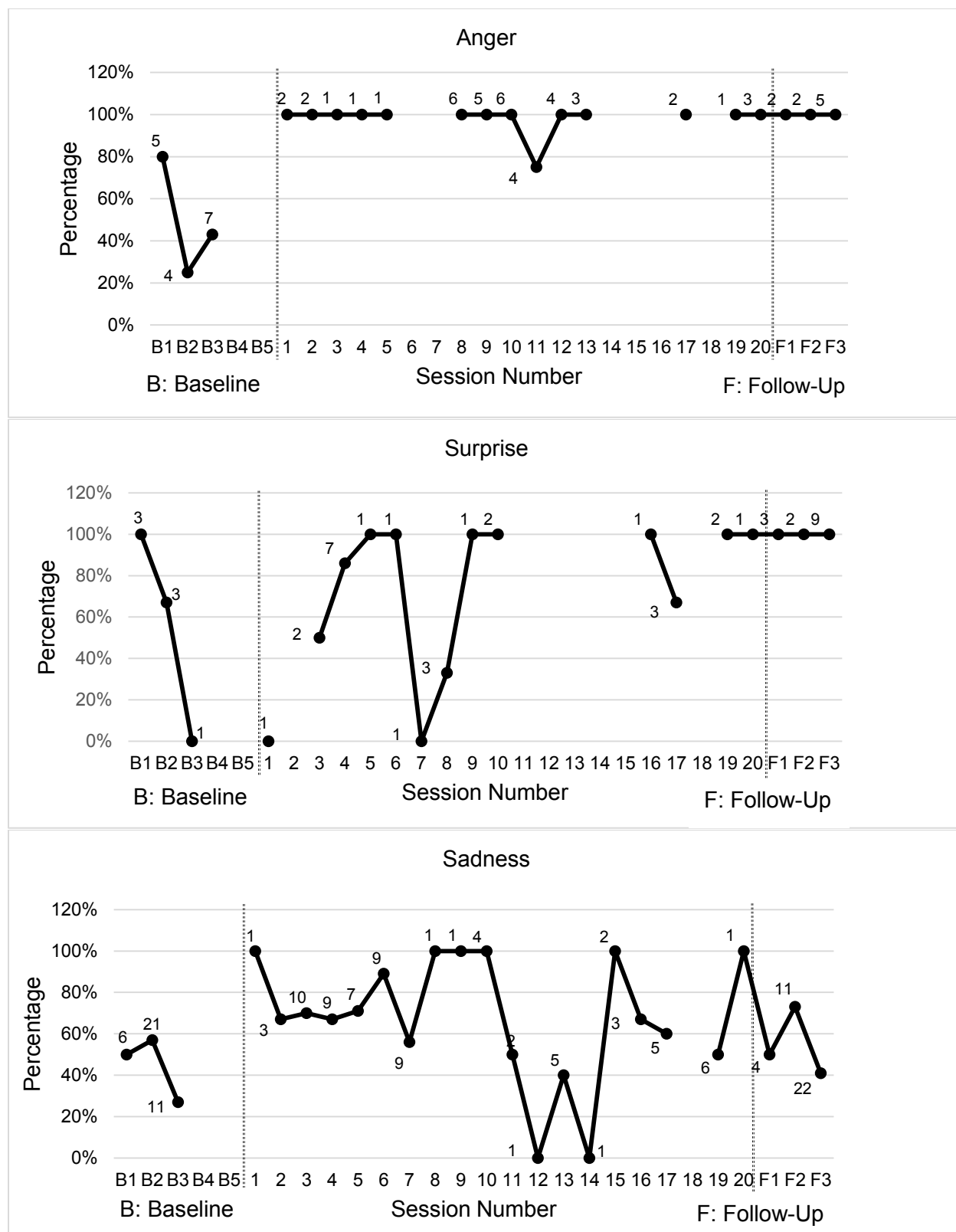


Figure 1. Percentages of correct production for anger-, surprise-, and sadness-based words by ZY per session.

The category of *surprise* appeared to be the least understood emotion by ZY. Additionally, when the clinician was targeting the *fear* category, ZY often responded with a *sadness*-based emotion word. For example, during session six, the clinician was reading the children’s book “Found” with ZY and the clinician asked her how Bear was feeling. ZY responded, “sad” even though “afraid” or “nervous” would have been a more appropriate response.

This is interesting because ZY’s understanding of *sadness* appears to be unstable and because ZY demonstrated a high level of proficiency for the category *fear* in baseline, during intervention, she demonstrated a low level of proficiency.

## XW

Percentage of correct production for the emotion word category of *disgust* produced by XW during the intervention are presented in Figure 2. XW did not use any emotion-based words in the category of *disgust* during baseline even though prompts were given targeting an elicitation of the category *disgust*. When XW did produce the emotion-based words in the category of *disgust* during intervention, he used it correctly.

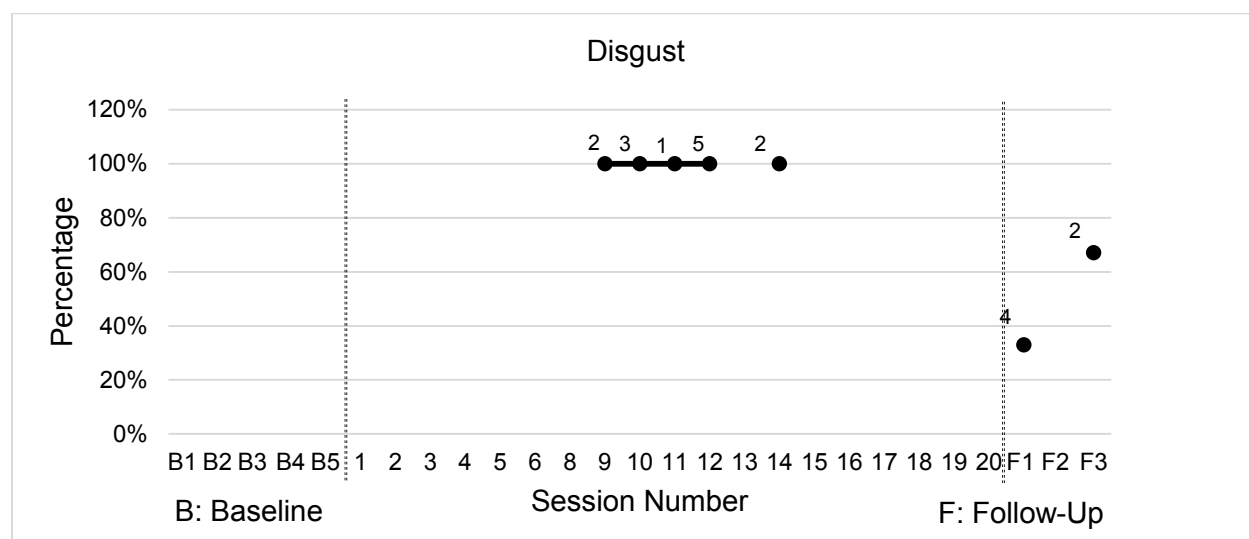


Figure 2. Percentages of correct production for disgust-based words by XW per session.

However, during follow-up, his productions were sometimes incorrect indicating partial understanding of the category. The PND for *disgust* was 100%. There were many sessions during intervention that *disgust* was targeted, but not produced by XW.

When XW did produce a word in the category of *disgust* during intervention, he used it correctly. One reason for this is that XW did not overgeneralize the use of the category *disgust*, meaning he did not produce that category when other categories were targeted. He did, however, use other emotion categories 53% of the time when *disgust* was targeted. XW produced *fear* when *disgust* was targeted 10 times. He produced *anger* seven times, *sadness* five times, and *surprise* three times. The data suggest that XW had relatively little knowledge of the emotion category *disgust* before the intervention and that with support from the clinician, XW was able to use *disgust* specifically and accurately.

It might generally be assumed that XW decreased in percentage of correct production of *disgust* based on follow-up data being lower than intervention data. However, given the additional information about his nonuse of *disgust* during baseline, it can be reasoned that XW's understanding of *disgust* increased over the course of the intervention. Follow-up data indicate that even without support from the clinician, XW retained awareness and knowledge of the category *disgust* even though he did not use it accurately 100% of the time.

## VU

Of the six categories of emotion words, *happiness*, *fear*, *anger*, *sadness*, and *disgust* are not reported because baseline data suggested that VU had an appropriate level of knowledge of these categories of words. *Surprise* was tracked and is reported in Figure 3. VU displayed either no use or incorrect use of the emotion-based word category *surprise* during baseline. His correct use of the category of *surprise* was exceptional during the intervention and then regressed back



to slightly above baseline during follow-up. The PND for *surprise* was 90% indicating that the intervention was highly effective for VU in that domain.

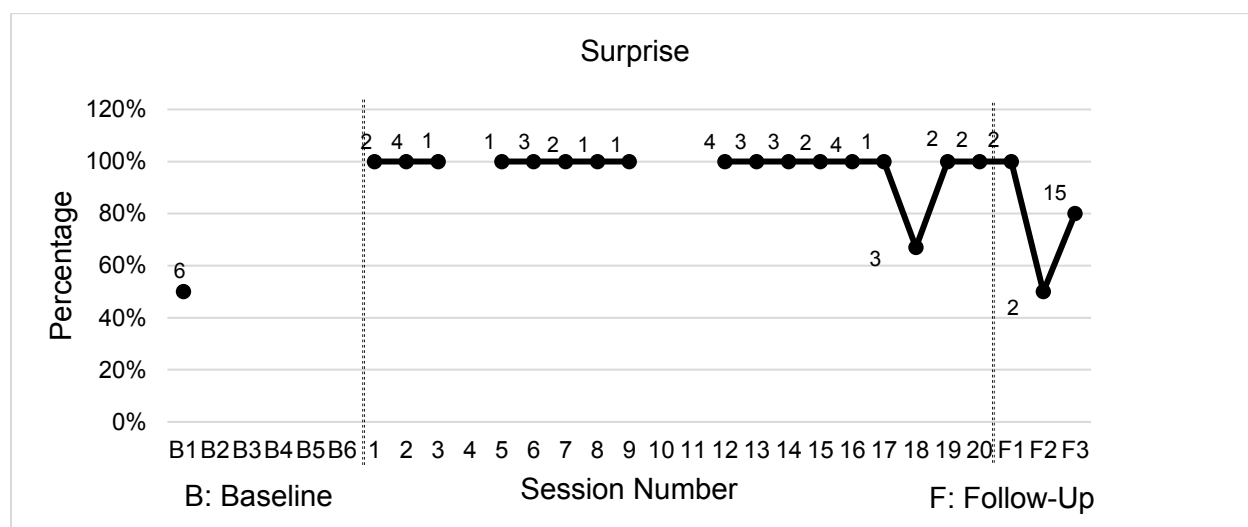


Figure 3. Percentages of correct production for surprised-based words by VU per session.

VU's results for *surprise* are similar to XW's results for *disgust*. They both displayed little to no knowledge of the emotion category despite prompts designed to elicit production of those categories. They then performed well during intervention and displayed an increase in understanding in follow-up compared to baseline.

## RQ

RQ's targeted word categories were *anger*, *happiness*, and *sadness*. Percentages of correct production are presented in Figure 4. RQ's correct productions of *anger*- and *sadness*-based words varied widely over the course of the intervention. *Happiness*-based word productions were generally high during the intervention, but were less correct during baseline and follow-up. The PND for *anger* was 57% indicating mild treatment effects. The PND for *sadness* was 48% indicating that treatment did not have an effect. The PND for *happiness* was 79% indicating mild treatment effects.

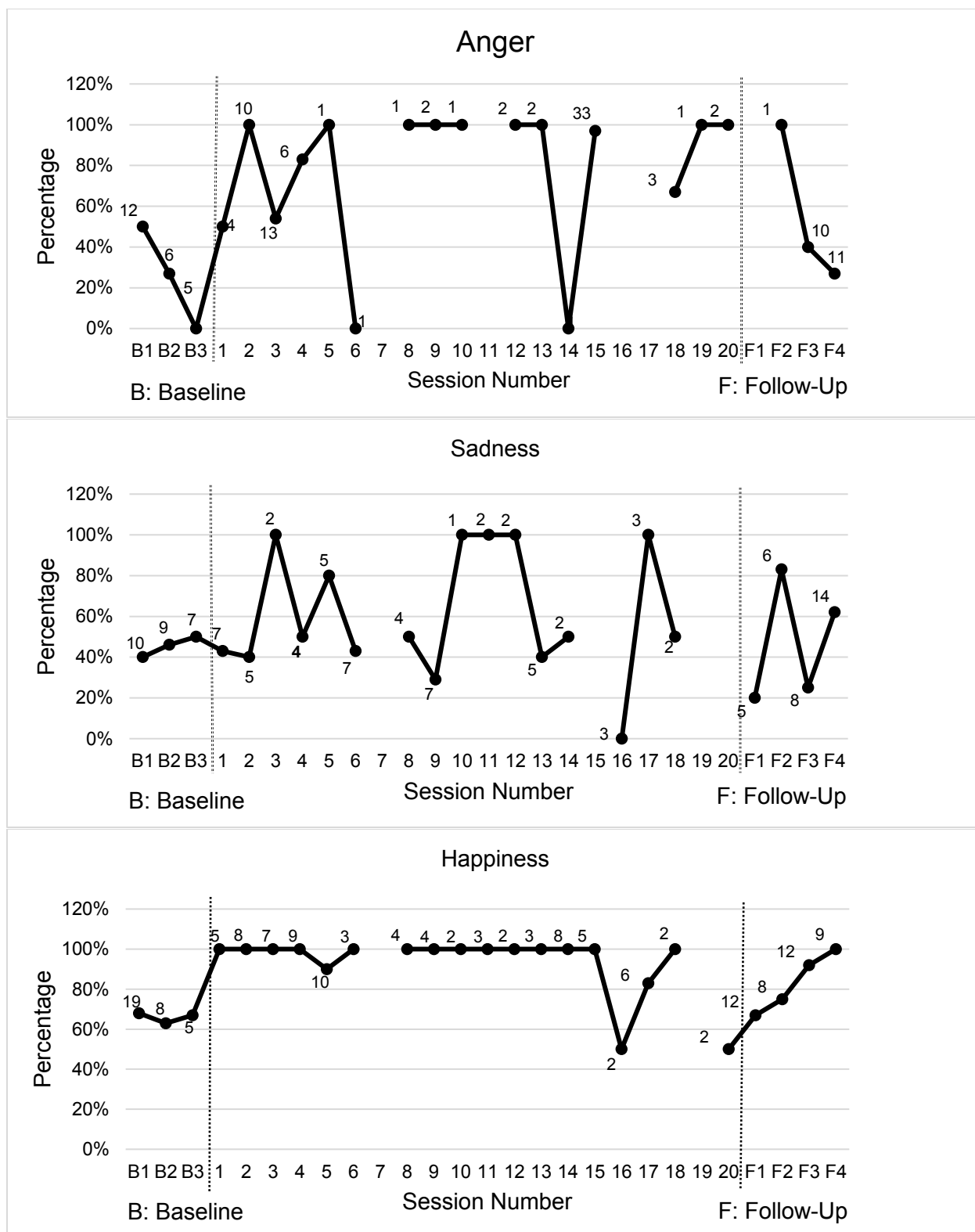


Figure 4. Percentages of correct production for anger-, sadness-, and happiness-based words by RQ per session.

It is interesting to note that RQ's percentage of correct production for *sadness* was highly variable throughout the intervention. *Sadness* is a basic emotion. Children have many exposures to *sadness*, much more than later developing emotions such as *disgust*. RQ produced *sadness*-based words frequently in place of other emotion categories. Most often RQ produced *sadness* words when *fear* was appropriate (28 times). However, his use of *sadness* words when other words would have been appropriate extended to *surprise*, *anger*, *disgust*, and even *happiness*. RQ used *sadness* 100% correctly during five intervention sessions. During the third session, he used *sadness* words twice. In the 10th session he used a *sadness* word once. For the 11th and 17th sessions, *happiness* and *sadness* were the targets of intervention, meaning that more complex word categories were not targeted.

Lastly, during the twelfth session, RQ only produced three emotion words total, one of them being a *sadness*-based word. The variability of *anger* is similarly explained. Many of the extreme percentages were based on low frequencies of occurrence (e.g., one correct or incorrect production during a session). Other sessions had higher frequencies of occurrence on which to base percentages. It is probable that increasing the frequency of productions may have resulted in less variability.

### Discussion

Many school-age children with LI have difficulties with aspects of social and emotional learning. This study was structured to evaluate one aspect of the effectiveness of a social communication intervention, the appropriate production of emotion words. Four school-aged children with LI participated in 20 sessions of story-based intervention targeting understanding and usage of emotion-based words. Emotions targeted included the emotion word categories of *happiness*, *sadness*, *anger*, *fear*, *surprise*, and *disgust*.

Because the children's knowledge of the various emotion word categories varied from child to child, each child had different target categories. Although somewhat variable, the data showed that the children did make progress in their use of some of the emotion word categories that they did not understand at baseline. This can be visualized by the trend lines present in each of the graphs presented in the Results section. Additionally, the PND gives an idea of how effective the treatment was for each child. The progress that each child made will be discussed in their individual findings.

A caution to keep in mind when looking at the data is that percentage of correct production analysis works best with multiple data points so as to reduce the effects of outliers. In each session, the participants produced a variable number of emotion-based words. At times, a participant would produce a word from an emotion category only once during a session. For clarity, the total number of productions during each session is included in the figures next to each data point.

### **Individual Findings**

**ZY.** ZY's proficiency for *surprise* was strong during follow-up. She produced this emotion category specifically and correctly. She accurately used *surprise* when it was appropriate to do so and did not produce it as a label for other emotion categories. This was an improvement from baseline and also, to a degree, from intervention. She only mislabeled *surprise* six times during follow-up, most often using a *sadness*-based word as an inappropriate label. This was likely related to the fact that in these cases the word *surprise* was used to indicate a negative surprise (e.g., such as finding your car had been stolen). The negative use of *surprise* tended to be more complex than the positive use of *surprise*. Positive valence *surprise* only has

one primary emotion category that it might be confused with: *happiness*. Negative valence *surprise* has several emotions it could be confused with: *sadness*, *anger*, *fear*, and even *disgust*.

ZY's proficiency for *anger* was also strong during follow-up. She produced this emotion category specifically and correctly. She accurately used *anger* when it was appropriate to do so and did not produce it as a label for other emotion categories. Although strong in the production of *anger*, ZY did misidentify *anger* seven times during follow-up. In doing so, she substituted a *happiness* word or a *sadness* word. One substituted word ("tiredish") fell into the emotion category of "other." The fact that ZY mislabeled *anger* and *surprise* a few times when they were targeted indicates that even at the end of the intervention, ZY did not have a full understanding of these emotion categories. She understood that these labels were not to be used for emotions such as *disgust*, but she was still learning to identify *anger* and *surprise* in all their manifestations.

ZY's percentage of correct productions of *sadness* did not show improvement. This is mostly likely because ZY was still overgeneralizing *sadness* when she did not know which label to produce for other emotions. ZY used the category *sadness* as a general word that was substituted for any emotion being displayed or experienced with which she was not familiar. It is possible that as ZY's understanding of the other emotion word categories grows, her percentage of correct productions of *sadness* will increase as well.

It is interesting to look at which emotion word categories ZY substituted for other emotion word categories. ZY mislabeled *fear* 27 times over the course of the study, *surprise* 21 times, *anger* 17 times, *sadness* seven times, *disgust* four times, and *happiness* three times. Most often ZY used *sadness* as a label for these emotions, again highlighting that she used this category as a catch-all. What is also interesting is that this was not only the case for emotions

with a negative valence, but happened on three occasions with *happiness*. These are notable errors for an 11-year-old child.

**XW.** XW made numerous errors during the course of the intervention, mislabeling the category of *fear* 62 times, followed by *surprise* 42 times, *disgust* 24 times, *sadness* 17 times, *anger* seven times, and *happiness* four times. KG appeared to use the emotion word category of *sadness* for a general all-purpose word to label emotions of negative valence. For example, of the 62 times that *fear* was mislabeled, *sadness* was substituted 20 times. When other categories (*surprise*, *anger*, *fear*, and *disgust*) were targeted, XW used *sadness* as an incorrect label 39 times. Conversely, *sadness* was only mislabeled 17 times. As the treatment progressed, XW's incorrect productions of *sadness* decreased in frequency, indicating that his understanding of other categories was growing so that he did not over use *sadness* as much. Thus, as he became more proficient at using other emotion words, his over-generalization of the word category *sadness* decreased.

Illustrative of XW's growing ability to use emotion words more appropriately over the course of the intervention, XW did not use the emotion category of *disgust* at all during baseline or in the early stages of the intervention. When *disgust* was targeted in intervention, he substituted other emotion words initially (24 times). As he acquired this word category, he rarely used *disgust* as an incorrect label. XW's understanding of *disgust* grew over the course of the intervention as evidenced by his subsequent appropriate use of the word.

**VU.** VU displayed a high level of proficiency during baseline, having difficulty with only the category of *surprise*. VU did not use *surprise* at all during baseline and at the beginning of the intervention. He appeared to have a limited awareness or understanding of the emotion category *surprise*. During the course of the intervention, however, VU appeared to have acquired

an understanding of the category, as evidenced by his 100% correct usage during the intervention. Once clinician support was taken away, VU retained his use of the category *surprise*, although not at the same high level as observed during intervention.

**RQ.** RQ was the youngest participant in the study and also made more errors (172) than any of the other children. He displayed limited proficiency at baseline for four out of the six emotion categories, which may be explained by his younger age. The intervention seemed to be most effective at increasing RQ's understanding and correct use of *anger*- and *happiness*-based words. His PND for anger was 57% indicating mild treatment effects and his PND for *happiness* was 79% also indicating mild treatment effects. At the beginning of the intervention RQ often produced *anger* when *surprise* or *disgust* would have been appropriate (12 times and nine times, respectively). As RQ's understanding of *disgust* grew, he stopped producing *anger* when *disgust* was targeted and so his percentage of correct productions for *anger* increased. It also increased because RQ gradually started using *sadness* and *fear* to describe negative *surprise* instead of using *anger*. His understanding of *surprise* did not increase, but he did understand that *anger* was not an appropriate label for negative *surprise*.

RQ's PND for *sadness* was 48% indicating that the treatment had no effect on that emotion category. The most common reason that RQ produced *sadness* inappropriately was because he substituted it for *fear*. RQ used *sadness* instead of *fear* 26 times over the course of the intervention, even up until the last day. RQ had an understanding of *fear* because he used *fear* words correctly 35 times, most often using the words "nervous," "worried," and "scared." However, it also appeared that he did not have a full understanding because he often used *fear* in place of *sadness*. Conversely, towards the end of the intervention, RQ occasionally produced

*fear* when *sadness* was targeted, indicating that he was trying to understand the scope of these two emotions, but he was still unsure of what constituted *fear* and what constituted *sadness*.

RQ's correct use of *happiness* stayed level over the course of the intervention, but intervention was higher compared to baseline. This is most likely because RQ's understanding of *surprise* did not increase during the intervention. He often used *happiness* as a label for positive *surprise* (13 times). For example, while reading the Giraffe and Elephant stories, Elephant dropped a ball into a pool. When asked how Giraffe felt, RQ responded "happy" when "surprised" would have been a more appropriate response. If RQ's understanding of *surprise* had increased, then the *happiness* graph would have reflected more accurate usage of *happiness*. However, RQ's misuse of *happiness* extended beyond *surprise*. He also used *happiness* as a label when *fear* (five times), *anger* (three times), *disgust* (three times) and even *sadness* (two times) would have been appropriate. Some of these mislabels were produced when RQ was shown a picture with context clues to the emotion, but the person's facial expression was not shown in the picture. This may be why he made such a large number of valence errors.

### **General Implications**

It is surprising that elementary school-age children with LI would have difficulty with the basic emotion categories selected for this study. *Happiness*, *sadness*, *fear*, and *anger* are portrayed in music and television. Family members, teachers, and friends experience and express these emotions regularly. Perhaps most importantly, the participants themselves experience these emotions. Emotions are implicitly expressed (through facial expressions, gestures, prosody, etc.) and explicitly expressed (through expressions such as "I'm so happy!"). The general exposure to emotion words during childhood did not appear to be enough for these children with LI.



It might generally be assumed that if children can use an emotion word, they also have a generally accepted understanding of the word. The results of this study contradict this assumption. Children in the study used emotion words incorrectly many times, even confusing categories of differing valences (positive vs. negative). For example, XW was shown a wordless picture story about a cartoon elephant and giraffe. The giraffe was in a situation where *fear* would be the expected emotion. The giraffe's facial expression conveyed *fear*. When asked how Giraffe would feel, XW responded "happy." VU similarly produced "worried" when "happy" was the appropriate response. In a story using the same characters of Giraffe and Elephant, ZY was asked how giraffe would feel. She responded "sad" when the appropriate response would have been "happy." While these valence errors did not occur very often, they happened more often than expected. The results of this study suggest that understanding cannot be assumed simply from the production of the emotion word. Appropriateness of use is a more specific measure of understanding.

In the case of these four children, there was not a single profile of emotion word use. Each child displayed different levels of proficiency for the different emotions. For example, VU and XW exhibited proficiency in baseline for the emotion category *happiness*, whereas RQ and ZY exhibited a lesser understanding of *happiness* at baseline.

### **Limitations of the Study**

Although attempts were made to keep the intervention as consistent as possible, individual client needs dictated that some differences were necessary. For example, the clinician used a flexible script for each session in order to provide some consistency. However, the clinician was also allowed to make adjustments to the script to meet the needs of individual participants. These adjustments were limited to variable frequency of cuing and types of cuing.

The participants were also sometimes given a choice as to which book they wanted to read with the clinician. Although books were selected to highlight emotions, this still introduced some variability in the intervention because different books tended to emphasize different emotions.

Additional variables pertaining to the logistics of delivering the intervention in an actual school context included session length and number of total sessions for each participant. The clinician was allotted 20 minutes for each session, however due to the study being done at a school in session, some intervention sessions were slightly longer or shorter than 20 minutes. This slight variability may have impacted the results of the study.

Additionally, each child only received two 20-minute sessions per week. The intervention was structured this way in order to fit within the limitations of a typical school setting. The speech schedule of two intervention sessions per week was established by the speech language pathologist and by the school. The researchers could not pull the participants away from their classroom longer or more often than allotted by the school. Doing therapy after the school day was also not feasible. Ideally, the children would have been able to participate in daily sessions. The low frequency of sessions may have limited growth on the targeted behaviors.

### **Directions for Future Research**

The results of the current study present some promising preliminary findings. Thus, more highly controlled efficacy studies are warranted. One way to expand upon the current study would be to increase the number of potential participants so as to be able to have several children working on the same emotion. This would make possible the use of a multiple baseline single subject design. Additionally, a study comparing the effects of traditional treatment as opposed to interventions targeting emotion knowledge in children with LI may be insightful.

Further improvements upon the current study could be made in regards to the structure of the intervention sessions. Intervention by the clinician was mostly done through example and modeling. When a child produced an incorrect emotion-based word, little to no constructive feedback was given by the clinician. It may be the case that a combination of modeling and feedback would have been helpful. In future studies, explicit teaching of emotion perception and emotion understanding, especially when misperception and misunderstanding occur, might be effective at further increasing the emotional intelligence of children with LI.

### **Conclusion**

The participants in the study with LI demonstrated inconsistent understanding of emotion words. This may require specific and intensive therapy. These children often overgeneralized emotion-word categories and did not consistently substitute one category for another. As a practical application for speech language pathologists, the variability of emotion category understanding between children suggests that each child with LI should participate in a quick baseline screening to determine which emotion categories that particular child has difficulty with before conducting therapy.

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## APPENDIX A

**Annotated Bibliography**

Adams, C. (2002). Practitioner Review: The assessment of language pragmatics. *Journal of Child Psychology and Psychiatry*, 43, 973–987. doi:10.1111/1469-7610.00226

**Purpose of Study:** Due to the influence of social, linguistic, cognitive and cultural factors on language pragmatics, assessing pragmatics developmentally has been problematic. Adams reviewed current assessments to determine effectiveness.

**Method:** Adams reviewed and evaluated a selection of commonly used formal and informal pragmatic assessments and determined what aspects of pragmatics each measure targeted.

**Results:** Formal tests traditionally do not do a good job of measuring pragmatic behaviors. Pragmatic assessment of preschool children should focus on naturally eliciting communicative intent. Pragmatic assessment of older children should include a wider range of tasks to evaluate a range of pragmatic abilities, including speech acts, conversational and narrative abilities, understanding of intent and using contextual cues to gain insight.

**Conclusion:** A standard set of identification tools can be gleaned from the many assessments available. Further research should be conducted to specify norms for pragmatic development.

**Relevance to Current Work:** Pragmatics is one of three components of social communication. Our study is built on the work already done in the area of pragmatics with children with LI.

Adams, C. (2005). Social communication intervention for school-age children: Rationale and description. *Seminars in Speech and Language*, 26, 181-188. doi: 10.1055/s-2005-917123

**Purpose of the Study:** To define the purpose of social communication interventions and the domain of social communication difficulties, which is not single deficit, but a set of deficits that includes social interaction, social cognition, pragmatics, and language processing.

**Method:** Six school-aged children (ages 6;0 to 9;11) with pragmatic language impairment (PLI) participated in a single-case design study. All participants received 24 therapy sessions based on the social communication intervention framework which was designed to address all four areas of social communication. One participant's results in particular were described in detail and presented similarly to a case study.

**Results:** Parent and teacher reports were used to measure each participant's progress post-intervention. Significant gains were seen in conversational skills both at home and at school. Few gains were made in pragmatic skills. Some gains were made in recall and sentence formulation and less significant gains were made in inferencing and narrative comprehension skills.

**Conclusions:** The social communication intervention was not examined on only one aspect of communication because social communication deficits occur in four different aspects of

communication. The author designed the study so that the intervention would be applicable to a variety of children. An examination of this intervention framework in a large-scale study is warranted.

**Relevance to the Current Work:** Adam's definition of social communication is used as the rationale of the current study.

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

**Purpose of Study:** To evaluate the effectiveness of a manualized social communication intervention for elementary school-aged children with pragmatic language impairment (PLI) in increasing social communication skills.

**Method:** Eighty-eight elementary school-aged children identified as having PLI were randomly assigned in a 2:1 ratio to receive the study intervention or to receive treatment-as-usual. The participants were assessed pre-intervention, immediately post-intervention and at 6-month follow-up.

**Results:** The treatment group did not differ from the control group on structural language ability or narrative ability. However, there were significant improvements in conversational competence, pragmatic functioning and social communication and classroom learning skills as measured by the assessment tools selected.

**Conclusion:** There is potential for change for school-aged children with persistent pragmatic and social communication needs. Even relatively short periods of speech and language therapy can have an impact.

**Relevance to Current Work:** The current study expands this intervention structure to children with LI and focuses on emotion intelligence.

Alt, M., Plante, E., & Creusere, M., (2004). Semantic features in fast-mapping: Performance of preschoolers with specific language impairment versus preschoolers with normal language. *Journal of Speech, Language, and Hearing Research*, 47, 407-420. doi: 10.1044/1092-4388(2004/033)

**Purpose of Study:** To consider the ability of 4- to 6-year-old children with LI to learn a new label for an object or action (fast mapping) compared to peers with typical language. More specifically, do children with LI map fewer semantic attributes of novel objects or actions than their peers with typical language?

**Method:** Fifty-two children from Arizona participated in the study. Half of the children had LI and half of the children had typical language. The children were matched for age, plus or minus

three months, and for gender. Participants in the study were introduced to 12 novel actions and 12 novel objects. Through a process designed to generate plausible and unique non-words, 12 non-words were selected for the study. Four semantic features were attached to each novel object or action and the children were tested on these semantic features after they were exposed to the novel objects and actions.

**Results:** Children with LI identified fewer semantic features than their peers for both objects and actions. All the children (both with LI and with typical language) were less accurate at identifying semantic features of actions compared to objects. Although not the main inquiry of the study, the researchers found that children with LI did not recognize as many labels as the children with typical language did.

**Conclusion:** The results suggest that children with LI have difficulty learning words at a basic conceptual level, as well as at a labeling level. This coincides with clinical observations of children with LI. In our field, we have a responsibility to help children with language difficulties to learn words. The findings of this study indicate that to help them learn words, we will need to address the conceptual level and the labeling level.

**Relevance to Current Work:** Our study seeks to help children with LI gain a fuller understanding and use of new vocabulary, specifically emotion words.

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

**Purpose of Study:** To consider the ability of children with LI to interpret the emotion conveyed by prosody using short stimuli, such as individual words or short phrases spoken to convey a particular emotion.

**Method:** Vocal affect was displayed via utterances spoken by a professional actress in an angry, happy, or sad voice. Six graduate students participated in a panel to decide which of the 15 two-to-five syllable utterances to use. The panel decided on ten utterances as the best examples of each of the three emotions. Thirty-eight children participated in the study (19 children with language impairment and 19 children with typical language) and were asked to respond to the utterances by pointing to a picture of an angry sad or happy face. Before listening to the recorded utterances, the children were asked to identify the emotion expressed on the picture drawings of the three emotions. All children were successful at that task.

**Results:** Children with LI were significantly less accurate at correctly identifying vocal affect than children with typical language. Children with typical language found the task quite straightforward and collectively scored with a mean of 26.9 out of 30 or 90% accuracy. The children with LI collectively presented with a mean of 20 out of 30 or 67% accuracy. The difference between the scores of the two groups significant. Children with LI tended to judge all three emotions as anger.

**Conclusion:** Children with LI have difficulty identifying the emotions happy, sad, and angry when expressed via vocal affect. The promising preliminary results of the study should be

expanded upon and studied in larger groups of children whose language disorders have been more thoroughly evaluated.

**Relevance to Current Work:** The results of this study suggest children with LI may have difficulty with emotional. The current study is evaluating an intervention to increase one aspect of emotional intelligence in children with LI.

Bishop, D. V. M. (2006b). What causes specific language impairment? *Current Directions in Psychological Science*, 15, 217-221. doi: 10.1111/j.1467-8721.2006.00439.x

**Purpose of Article:** Bishop reviews past theories of the cause of LI (i.e., poor parenting, transient hearing loss, and subtle brain damage around the time of birth) and discusses current scientific evidence for the causes of LI (i.e., genetic and environmental risk factors).

**Summary:** Past theories related to the cause of LI have little scientific support. Current studies have evidence to support genetic makeup as a prevalent factor in the cause of LI because LI often occurs in families. However, it is important to note that families share environment as well as genetic influences. Stronger scientific evidence for genetic cause is found in twin studies. Identical twins (monozygotic) are more likely to both have LI than fraternal twins (dizygotic). Genes may play a role in determining LI characteristics in children, but they may not determine how a child respond to an intervention. Genetic knowledge should be used identify children with LI earlier so that they can have an opportunity to participate in early intervention.

**Relevance to Current Work:** Bishop argues that just because genetics may be involved in the cause of LI, intervention can still be effective at remediating LI. The current study examines aspects of an intervention for children with LI.

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.

**Purpose of Study:** To evaluate conversational responsiveness in children with LI.

**Method:** Children with LI were identified as either having typical pragmatic abilities (SLI-T) or difficulty with pragmatic skills (PLI). These children's responses to conversational bids from adults were compared with age-matched peers' and younger language-matched peers' responses.

**Results:** Participants in the study usually responded to the conversational bids. However, children in the group with PLI were more likely than children in the control groups to give no response and to not use nonverbal responses.

**Conclusion:** Evidence shows that a subset of children with LI have disproportionate pragmatic difficulties beyond that expected because of deficits in language form.

**Relevance to Current Work:** Pragmatic ability is one of the components making up social communication.

Brinton, B., Fujiki, M., Hurst, N.Q., Jones, E.R., & Spackman, M.P. (2015). The ability of children with language impairment to dissemble emotions in hypothetical scenarios and natural situations. *Language, Speech, and Hearing Services in Schools, 46*, 325–336. doi: 10.1044/2015\_LSHSS-14-0096.

**Purpose of Study:** To determine how children with LI and their peers with typical language judge hypothetical situations and natural situations in which social display rules would require emotion dissemblance.

**Method:** Participants were given two tasks. The first task presented children with hypothetical situations in which social display rules would dictate that the child dissemble the emotion. In the second task, the participants were presented with four naturalistic opportunities to dissemble emotion (e.g., receiving a disappointing reward for taking part in the study).

**Results:** Results for hypothetical situations replicated the findings of the earlier study (Brinton et al., 2007). Results for natural situations were more nuanced. In low-cost situations (i.e., the consequences of displaying the emotion are minimal for the child) there was little difference between typical children and children with LI. In the high-cost situation (i.e., the consequences of displaying an emotion are higher), the results neared statistical significance (.058) between the two groups of children. Children with LI were less likely than typically developing children to dissemble negative emotion in those situations.

**Conclusion:** The ability to dissemble emotion was still an emerging skill for children in both groups, however children in the typically developing group judged that dissemblance was appropriate significantly more often than did children with LI in the hypothetical scenarios. In the naturalistic context, children with LI did not dissemble as often as typically developing children in the high cost context.

**Relevance to Current Work:** Children with LI displayed poorer emotional understanding in the dissemblance tasks than did typically developing children.

Brinton, B., Spackman M. P., Fujiki, M., & Ricks, J. (2007). What should Chris say? The ability of children with specific language impairment to recognize the need to dissemble emotions in social situations. *Journal of Speech, Language & Hearing Research, 50*, 798-811. doi: 10.1044/1092-4388(2007/055)

**Purpose of Study:** To determine how children with LI and their peers with typical language judge situations where social display rules would require emotion dissemblance.

**Method:** Nineteen children with LI and 19 without LI answered questions about 10 hypothetical situations (e.g., Chris wants a cowboy costume for Halloween. Chris's grandma makes a dinosaur costume for Chris. What should Chris say?). Responses were categorized as either displaying the emotion or dissembling it.

**Results:** Compared to typical peers, children with LI have more difficulty judging when to dissemble or conceal an emotion that would be perceived as inappropriate to display according to social display rules.

**Conclusion:** Children with LI appear to undervalue the impact that displaying a pragmatically inappropriate emotion would have on a relationship. Both children with typical language and children with LI understood the social display rules (i.e., what the expected response would be), but the children with LI displayed those emotions anyway.

**Relevance to Current Work:** Emotion dissemblance plays a critical role in social interaction. It seems likely that poor emotional intelligence contributes to the social difficulties that these children experience. This in turn support a need for further research into intervention strategies for this population that would target limitations in emotional intelligence.

Conti-Ramsden, G. (2003). Processing and linguistic markers in young children with specific language impairment (SLI). *Journal of Speech, Language, and Hearing Research*, 46, 1029-1037. doi:10.1044/1092-4388(2003/082)

**Purpose of Study:** To determine if four tasks (two processing and two linguistic) were positive markers for LI in young children.

**Method:** Sixty-four children (all approximately five years old) divided into two equal groups participated in the study. Thirty-two children were identified as having LI based on scores from the Clinical Evaluation of Language Fundamentals–Preschool (CELF-P; Wiig, Secord, & Semel, 1992). The other 32 children were recruited from the same area and were selected on the basis of typical language and nonverbal development as reported by an informal assessment completed by their classroom teacher. The two linguistic tasks were past tense and noun plural tasks. The two processing tasks were non-word repetition and digit recall.

**Results:** Children with LI displayed significantly more difficulty on all four of the tasks compared to their age-matched peers. Non-word repetition and past tense marking were found to be the most accurate markers for identifying young children with LI.

**Conclusion:** Non-word repetition tasks and past tense marking tasks can be used to effectively screen for LI in young children.

**Relevance to Current Work:** The participants in the current study present with LI.

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: 10.1044/1092-4388(2003/002)

**Purpose of Study:** To examine the ability of kindergarten children with LI correctly infer emotional reactions in social situations.



**Method:** Kindergarten children with LI and their typical peers participated. To ensure the children knew which facial expression went with which emotion vocabulary word, the participants were asked to label four facial expressions (happy, sad, mad, and surprised) and then they were asked to point to the correct facial expression when given a verbal label. Short scenarios were then presented to the participants and they were asked to infer the emotional reaction in the story. The participants gave their answer by choosing among the four facial expressions.

**Results:** The children with LI correctly labeled and identified the facial expressions, demonstrating emotion knowledge, but they had difficulty integrating that knowledge and using it to make correct inferences about the emotional reaction in a story. The participants with LI performed more poorly than their age-matched peers.

**Conclusion:** Children with LI differ from their age-matched peers in the ability to process social information and correctly infer what emotions might be experienced in a short scenario,

**Relevance to Current Work:** Our study used social contexts in storybooks to teach aspects of emotional intelligence to children with LI.

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: 10.1044/1092-4388(2008/027)

**Purpose of Study:** To compare the ability of young children with typical language development and children with LI to make emotion inferences during conversation. This study also identified variables that predict emotion inferencing ability and explored the relationship between these variables and social competence.

**Method:** Thirty-two preschool children participated in the study, 16 children with LI and 16 children with typical language. The participants “watched narrated videos designed to activate knowledge about a particular emotional state” (p. 367). Following each animated story, half of the children in the study were shown a facial expression that matched the anticipated emotion related to the story and half were shown a facial expression that did not match the anticipated emotion. The children were asked to name the emotion displayed by the facial expression. The children’s teachers were asked to complete the social skills subtests of the Preschool Kindergarten Behavior Scales–Second Edition (PKBS-2; Merrell, 2003) as a measure of social competence.

**Results:** Response times showed that children with typical language took significantly more time to name the emotions in the mismatched condition than the matched condition. Children with LI took equal amounts of time to respond to the mismatched and the matched conditions. Children with typical language also presented with greater emotion inferencing ability and social competence. Vocal response time on the inferencing task was related to inferencing ability which in turn predicted social competence.



**Conclusion:** The results indicated that children with typical language were inferring emotions during the story, whereas children with LI were often not making these inferences during the story. The difficulties of children with LI were related to language measures. The ability to make online inferences of emotions is related to social competence.

**Relevance to Current Work:** This study solidifies our understanding of the deficits in emotion inferencing skills that children with LI have.

Fujiki , M., Brinton, B., & Clarke D. (2002). Emotion regulation in children with specific language impairment. *Language, Speech, and Hearing Services in Schools, 33*, 102-111. doi:10.1044/0161-1461(2002/008)

**Purpose of Study:** To measure emotion regulation in children with LI and their peers with typical language. The was a preliminary study to explore emotion regulation in children with LI and determine if it warranted further exploration as a factor that influences the social outcomes that children with LI experience.

**Method:** Using the Emotion Regulation Checklist (ERC, Shields & Cicchetti, 1997; 1998), teachers rated 41 children with LI and 41 age-matched children with typical language on their emotion regulation behaviors. Two age ranges were sampled (6 to 9 years old and 10 to 13 years old). Each age range contained equal numbers of male participants and female participants.

**Results:** Classroom teachers rated elementary school-age children with LI as significantly less capable at regulating emotions as their typical peers. In particular, boys with LI had the lowest ratings on the emotion regulation subscale than all other subgroups.

**Conclusion:** Emotion regulation should be researched further to determine its role in specific social outcomes in children with LI.

**Relevance to Current Work:** One of the aims of the intervention is to address emotional intelligence. Emotion regulation is a basic aspect of emotional intelligence.

Fujiki, M., Brinton, B. McCleave, C. P., Anderson, V. W., & Chamberlain, J. P., (2013). A social communication intervention to increase validating comments by children with language impairment. *Language, Speech, and Hearing Services in Schools, 44*, 3-19. doi: 10.1044/0161-1461(2012/11-103)

**Purpose of Study:** Four children with LI participated in a social communication intervention to increase the frequency of validating comments (e.g., making positive statements and asking others questions about themselves).

**Method:** Baseline was collected in three cooperative learning sessions for each child. Intervention lasted a period of 10 weeks, 40 (15-minute) sessions for three children and 20 (30-minute) sessions for the remaining child. Each week group sessions were conducted including instruction, novel peer play and a clinician review. Data monitoring for production of validating comments was implemented from peer play interactions.

**Results:** Three children showed improvement during the course of the intervention in validating comments. All three sustained the gains during follow-up, one of which showed a notable increase, while the other two showed moderate improvement. The remaining child showed little improvement from baseline. Social outcomes were not noted with respect to peer acceptance and friendship, however teachers reported that two of the children showed marked improvement in their social interaction with others.

**Conclusion:** Participants showed varied levels of successful response to intervention in the production of validating comments. A longer period of intervention may be required to see changes in peer acceptance and friendship.

**Relevance to Current Work:** This study evaluates the effectiveness of a social communication intervention for children with LI. The current study is also centered around a social communication intervention, but with different targets.

Fujiki, M., Spackman, M. P., Brinton, B., & Hall, H. (2004). The relationship of language and emotion regulation skills to reticence in children with specific language impairment. *Journal of Speech, Language, & Hearing Research*, 47, 637-646. doi:10.1044/1092-4388(2004/049)

**Purpose of Study:** To determine to what extent emotional regulation skills and language skills contribute to reticence in children with specific language impairment (SLI).

**Method:** Forty-three children with SLI and 43 typically developing children participated. Teachers rated the children using the Emotional Regulation checklist (to measure emotion regulation) and the Teacher Behavior Rating Scale (providing a measure of reticence). The teachers did not know the purpose of the study but they did know which child was typically developing and which child had SLI. The Comprehensive Assessment of Spoken Language (CASL) was administered to all 86 children to measure language level and document group membership.

**Results:** Emotional regulation scores and CASL scores were high predictors of reticence, explaining 43% of the variance. There was no difference between the two scores as far as predictive power.

**Conclusions:** This study indicated that emotional regulation impacts the reticence behavior in children with SLI. This suggests that intervention addressing emotional understanding would be a worthwhile target.

**Relevance to Current Study:** Our current study examines whether targeting emotional understanding through literature based therapy will increase the correct use of emotion words.

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, 330-345. doi: 10.1080/13682820701507377

**Purpose of Study:** To build on previous findings and further examine the emotion understanding skills of children with LI by examining the extent to which children with language impairment (LI) understand emotion conveyed by prosody (tone of voice) in a narrative passage.

**Method:** Children with LI and their age-matched peers participated in the study (sample size of 19). The participants ranged in age from 8 years to almost 11 years. Children with LI and their peers were presented with the same passage, read to convey four basic emotions (happiness, anger, sadness and fear). After being presented with the passage, the children were asked to indicate which emotion the actor reading the passage expressed.

**Results:** Children with LI had significantly more difficulty identifying the emotion expressed than their typical peers. For both groups of children, happiness was the easiest emotion to identify and fear was the most difficult.

**Conclusion:** The results suggest that children with LI have deficits in emotion understanding. The researchers suggest that if findings such as these are replicated, then interventions to address this deficit should be studied and considered.

**Relevance to Current Work:** The current work is exploring the efficacy of an intervention designed to improve an aspect of emotional intelligence. It addresses deficits in emotion understanding in children with LI.

Gerber, S., Brice, A., Capone, N., Fujiki, M., & Timler, G. (2012). Language use in social interactions of school-age children with language impairments: An evidence-based systematic review of treatment. *Language, Speech, and Hearing Services in Schools*, 43, 235-249. doi: 10.1044/0161-1461(2011/10-0047)

**Purpose of Study:** Intervention with pragmatic behavior has long been advocated for children with LI experience. However, only a few studies have addressed the efficacy of interventions designed to address these behaviors. This study systematically examined the efficacy of treatments developed for pragmatic language skills.

**Method:** Literature published between 1975 and 2008 addressing social communication interventions was systematically reviewed. The review focused on children with LI between the ages of 5 and 11 years. In the date range specified, only eight intervention studies were identified that were of high enough quality to be considered in the review.

**Results:** Sample size in the studies reviewed ranged from single-subject to 20 participants. An absence of normative data was common and treatment goals and procedures varied widely. Some interventions reported gains in topic management skills, narrative production, and repairs of inadequate or ambiguous comments.

**Conclusion:** Further investigation into the efficacy of interventions that focus on children's language use in social interactions should be undertaken. There was not enough evidence from the review to warrant recommendations for clinical practice.

**Relevance to Current Work:** The current study answered the call for further investigation into social communication intervention efficacy. Specifically, the efficacy of a social communication intervention in increasing correct production of emotion-based words.

McGregor, K. K., Newman, R. M., Reilly, R. M., & Capone, N. C. (2002). Semantic representation and naming in children with specific language impairment. *Journal of Speech, Language, & Hearing Research, 45*, 998-1014. doi:10.1044/1092-4388(2002/081)

**Purpose of Study:** To determine the quality of semantic representation for children with SLI in comparison with children of normally developing language skills.

**Method:** Sixteen children with SLI and 16 normally developing children were assessed. Both age and gender were balanced between the groups of participants. The ethnicities represented were 70 % Caucasian, with 30% minorities- either African American or Hispanic, which portrays a representative picture of U.S. demographics. Twenty object words and 20 line drawings were used as stimuli in the intervention. Participants were tested individually by either a graduate student or a speech-language pathologist. The three given tasks were, in the following order: naming, drawing, and defining. Naming responses that included involved associations, circumlocutions, novel derivatives, coordinate substitutions, and superordinate substitutions were coded as semantic errors. Errors that were not semantic in nature were coded as indeterminate, phonologic, or other. Drawing and defining analyses covered only the correct, semantic error, and indeterminate error pools.

**Results:** Children with SLI made considerably fewer correct naming responses than their peers. For both SLI and ND children the majority of errors were semantically related to their targets or indeterminate responses. The drawings and definitions for responses in error were poorer than correct responses, suggesting a limited semantic knowledge.

**Conclusion:** This study shows that knowledge of the child's semantic lexicon determines whether or not the child can reproduce the words. Limited semantic knowledge also affects children with SLI in relation to frequent naming errors.

**Relevance to Current Work:** The results of this study indicate that children with LI have difficulty with semantic representation. The current study focuses on emotion semantic representation intervention.

McGregor, K. K., Oleson, J., Bahnsen, A., & Duff, D. (2013). Children with developmental language impairment have vocabulary deficits characterized by limited breadth and depth. *International Journal of Behavioral Development, 48*, 307-319. doi: 10.1111/1460-6984.12008.

**Purpose of Study:** To expound upon the nature and course of vocabulary deficits in children with language impairment (LI). Is the nature of vocabulary deficits manifested in breadth, depth, or both? McGregor, et al. also wanted to know if vocabulary deficits resolve as children with LI age, or if the skill gap with typically developing peers widens with age.

**Method:** McGregor et al. “mined standardized test data collected as part of the Child Language Research Center Project, a longitudinal epidemiologic study of developmental LI (Tomblin et al. 1997)” (p. 309). The data of 502 children were selected for analysis, specifically oral definitions produced by the participants. Each definition given by each child was rated by three independent scorers. The researchers analyzed the data three different ways: for breadth, depth, and depth for children who produced at least one full definition. The purpose of each of these analyses was to determine the relationship between LI and vocabulary skill.

**Results:** Scores of the children with LI were significantly lower in the areas of breath and depth across all grades (second, fourth, eighth, and 10th) compared to their peers with typical language. The extent of the vocabulary skill gap did not vary significantly over time. Children with LI had slower growth of depth of vocabulary than in breadth of vocabulary knowledge.

**Conclusion:** When compared to children in the same grade with typical language, children with LI have smaller vocabularies and a more superficial understanding of the words in their vocabulary. The indication that vocabulary deficits continue through the school years suggests that children with LI should continue to receive intervention throughout school.

**Relevance to Current Work:** Deficits in general vocabulary would suggest deficits in emotion vocabulary. The aim of our study is to determine the effectiveness of an intervention in increasing depth and breadth of emotion vocabulary.

Merkenschlager, A., Amorosa, H., Kiefl, H., & Martinius, J. (2012). Recognition of face identity and emotion in expressive specific language impairment. *Folia Phoniatica et Logopaedica*, 64, 73-79. doi: 10.1159/000335875

**Purpose of Study:** To compare the ability of children with expressive LI and their typical peers to recognize emotion expressed on faces.

**Method:** In a desire to present stimuli in conditions more similar to an actual interaction, 13 different silent movie scenes were used to show facial expressions and gesture expressions. Twenty-four children with LI and 40 of their peers with typical language were asked to identify the emotion displayed by the movie scenes by providing a verbal description or label of the emotion, a pantomimed description of the emotion, or by drawing a line to a picture of a facial expression matching the emotion. The movie scenes portrayed feelings of joy, pain, fear, and anger.

**Results:** Children with LI scored significantly more poorly than their typical peers when identifying emotions from both facial expressions and gesture expressions. Importantly, the skill improvement that is associated with increasing age in typically developing children was lacking in children with expressive LI.

**Conclusion:** Children with LI experience a deficit in recognizing nonverbal signs of emotion (facial expressions and gestures). This nonverbal recognition skill does not increase with age as one would expect. This deficit may contribute to the social challenges that children with LI experience.

**Relevance to Current Work:** This study investigated emotion perception of children with LI, which aligns with our study's investigation. The lack of age-related skill development supports the need for intervention.

Spackman, M., 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 & Communication Disorders, 41*, 173-188. doi:10.1080/13682820500224091

**Purpose of Study:** To assess the ability of children with LI to infer emotions experienced by others in specific social scenarios.

**Method:** A sample size of 86 participants (43 with LI and 43 without, all age- and gender-matched) were presented with short scenarios in which a main character was involved in a situation designed to elicit one of four emotions: anger, fear, happiness or sadness. After being presented with a scenario, children were asked to indicate what emotion the character experienced. Additionally, further understanding of the emotions was probed by asking the children why the character would feel a certain emotion and asking how that emotion feels.

**Results:** Children with LI were significantly less accurate than peers with typical language. Happiness was most often accurately inferred by both groups of children followed respectively by sadness, fear, and anger. Older children were more accurate than younger children. Children with LI gave less detailed descriptions of emotions than peers with typical language.

**Conclusion:** Clinical interventions for children with LI should include teaching emotion recognition skills because these skills may be weak.

**Relevance to Current Work:** The current study investigated the ability of children with LI to correctly use emotion vocabulary in context.

Spackman, M.P., Fujiki M., Brinton, B., Nelson, D., & Allen, J. (2005). The ability of children with language impairment to recognize emotion conveyed by facial expression and music. *Communication Disorders Quarterly, 26*, 131-143. doi: 10.1177/15257401050260030201

**Purpose of Study:** To explore the relationship between children with language impairment (LI) and their ability to identify emotions in both expressions and music, in comparison to children with typical language development.

**Method:** Study 1 - Children with LI (n=43) and their typically developing peers (n=43) were sampled from two age ranges: 5 to 8 years and 9 to 12 years. The participants were shown



photographs of facial expressions and asked to label what emotion was being produced. Children were asked, “how does this person feel?” The children could respond verbally or by pointing to a representation of the emotion.

Study 2 - Excerpts of classical music were presented to children with LI and their typically developing peers. The children were asked to identify the emotion being conveyed by the music. Each child listened to each clip of music along with the examiner and were prompted for an emotional evaluation after each clip had ended.

**Results:** Children with LI were able to identify the facial expressions happiness, anger, sadness, fear as accurately as typical children. They were significantly less able to identify the emotions; surprise and disgust. Younger children were less able to identify anger and surprise than the older children. Children with LI differed significantly from typical children in identifying emotions through music, as did younger children in comparison to older children.

**Conclusion:** Children with LI differed significantly in identifying emotions that typical children with the emotions surprise and disgust, and in identifying emotions portrayed through music. Younger children also struggled in comparison to older children in identifying anger and surprise. Children with LI also had difficulty identifying the emotion conveyed by music.

**Relevance to Current Work:** This study is one of many that laid the groundwork to establish the presence of emotional intelligence difficulties in children with LI. This work and works like it established emotional intelligence as a worthwhile intervention target.

Taylor L. J., Mayberry M.T., Grayndler L., & Whitehouse A.J. (2015). Evidence for shared deficits in identifying emotions from faces and from voices in autism spectrum disorders and specific language impairment. *International Journal of Language and Communication Disorders*, 50, 452-466. doi: 10.1111/1460-6984.12146.

**Purpose of Study:** To determine to what extent children with autism spectrum disorders and language impairment (LI) have similar deficits in emotion identification.

**Method:** Participants in the study were divided into three groups: those with typical language, those with LI, and those with autism spectrum disorder. The children in the autism spectrum disorder group were subdivided into two groups: those with normal language skills and those with impaired language skills. The children all completed visual and auditory versions of an emotion recognition task. For the visual task, they were asked to look at pictures of people expressing one of six possible emotions (happy, sad, scared, angry, surprised, and disgusted). For the auditory task, they listened to a sentence with neutral emotional content, but read in a tone representative of one of the six emotions. The participants identified the emotions conveyed in each task by selecting a cartoon face on the computer screen that represented the emotion.

**Results:** Children with LI did more poorly than typical children on identifying complex and simple emotions (i.e., happy, sad, scared, angry). Children with autism spectrum disorder and typical language were more accurate at identifying the conveyed emotions than their peers with autism spectrum disorder and impaired language.

**Conclusion:** Children that are on the autism spectrum and have impaired language share emotion recognition deficits with children who have LI. These shared deficits may be influenced by the poor language abilities in common with the two groups.

**Relevance to Current Work:** The results of this study suggest that children with language impairments need intervention to be on level with their peers at emotion recognition skills. The current study is targeting skills that may help with emotion recognition.

Tomblin, J.B., Records, N.L., Buckwalter, P., Zhang, X., Smith, E., & O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children. *Journal of Speech Language and Hearing Research, 40*, 1245-1260. doi: 10.1044/jslhr.4006.1245

**Purpose of Study:** To estimate the prevalence of LI in monolingual, English-speaking, Kindergarten children.

**Method:** Using a stratified cluster sample of 7,218 children from urban, suburban, and rural areas, the authors screened for LI. The language screening failure rate was 26.2%. Children who failed the screening and a similar number of controls were then administered a diagnostic battery (n = 2,084) that provided for a diagnosis of SLI using common diagnostic standards. To determine the presence or absence of LI, a two-stage identification procedure was used. The first stage consisted of all 7,218 children receiving a brief language screening test. In the second stage, all the children who had failed the screener and 33% of the children who passed were given a full LI diagnostic battery.

**Results:** Of the participants in the study, 26.8% failed and 73.2% passed the language screening test. After the diagnostic phase was completed, the prevalence rate for children with LI was 7.4%. Of the kindergarteners diagnosed with LI, 59 % were male and 41% were female, indicating a higher prevalence of LI in males.

**Conclusion:** The authors gave perspective to the results of this study by interpreting them “in terms of the morbidity associated with this diagnosis” (p. 1258). Children with LI have been found to be at risk for reading difficulties and select behavioral disorders. There has also been evidence that the difficulties associated with LI extend into adulthood and are correlated with significantly lower income levels. Given the prevalence of the disorder and that reality that our nation’s work force is becoming less physically demanding and more cognitively and communicatively demanding, this disorder, if ignored, could have significant consequences both individually and for our society.

**Relevance to Current Work:** This study demonstrates that LI is not an uncommon disorder for monolingual English-speaking children. The interventions being tested in the current study have the potential to assist many children.

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



**Purpose of Study:** To determine the ability of children with LI and children with typical language to comprehend emotional affect and to express emotional affect.

**Method:** Sixteen children (eight with LI and eight with typical language) were selected so that they were all age-, sex-, socioeconomic status-, and I.Q. – matched. These participants were asked to identify emotional affect represented in visual pictures and vocal affect. They were also asked to express the same emotions presented visually through facial expressions and orally.

**Results:** Children with LI performed significantly worse on three of the four tasks than typical children: visual and vocal emotional affect comprehension and vocal emotional affect expression. The children with LI were more detailed and dramatic than the controls when expressing visual emotional affect.

**Conclusion:** Both visual and vocal comprehension of emotion is problematic for children with LI. Vocal expression is a deficit while visual expression is a strength. The authors suggest that “The heightened range of affective facial expression that they (children with LI) demonstrate may be a compensatory mechanism to offset their difficulties with vocal affect” (p.445).

**Relevance to Current Work:** This study addresses both comprehension and expression of emotion words. The current study is interested in discovering if a specific intervention will increase correct expression of emotions.

## APPENDIX B

**Clinical Evaluation of Language Fundamentals-5 (CELF-5)**

Participant	CELF-5 <sup>1</sup> Percentile Rank Scores					
	Age	Sentence Comp <sup>2</sup>	Word Structure	Formulated Sentences	Recalling Sentences	Core Percentile
VA	5:07	25	9	1	5	5
	Age	Word Classes	Semantic Relationships	Formulated Sentences	Recalling Sentences	Core Percentile
VU	09:10	50	2	16	5	9
XW	10:01	<1	16	9	2	2
ZY	10:11	5	2	25	2	4

*Note.* <sup>1</sup>Clinical Evaluation of Language Fundamentals-5 (CELF-5). <sup>2</sup>Sentence Comprehension.

## APPENDIX C

**Emotion Word Coding Manual**

Participant's Initials:

Session number and Date:

Length of Video:

Coding completed by:

Activity	Emotion Word	Emotion Category	Category in Error	Target Match	Time of Production	Type of Production	Valence Match	Specificity	Over-extended

## Emotion Word Coding Manual

### Guidelines for Each Coding Category

Emotion-Based Word (Child's Production) – Write (verbatim) the emotion word as it is produced by the participant.

Category of Child's Emotional Response – Group each emotion word into the category that is most closely synonymous to its actual meaning (e.g., *mad* will be grouped under *anger*; *excited* will be placed under *happiness*, etc.). Emotional categories will coincide with those defined by Dunn et al. (1987):

Happiness (H): like, love, happy, enjoy

Surprise (Su): surprise, surprised, confused

Anger (A): mad, angry

Fear (F): afraid, frightened

Disgust (D): used to describe feelings toward sensory feelings, smell, taste, sight, etc., Words like “smelly” and “yucky” are only coded when used as a feeling. (e.g. when the child is shown a picture of a boy eating a worm and when asked how the boy feels the child says “yucky.”)

Contempt (C): used to describe general feelings of dislike towards a person, laughing at someone meanly, “I hate the boy.”

Sadness (Sa): unhappy, sad, miserable

Category in Error (Target Production) –The production is considered correct if it is the same word (or a form of the same word) that the clinician is attempting to elicit. Spontaneous productions that are contextually appropriate are also considered accurate. Productions that are not the same as the word or category the clinician attempted to elicit are considered inaccurate and record the intended category of emotion state. For example, the clinician was attempting to elicit *sad* but the child said happy, the category in error was *sad*.

Production and Target Match – Compare the child-produced emotion word category and the target category. If they match, then it is counted as correct. If they do not match, it is counted as incorrect. For example, if the child produces a word in the happiness category and the target word category was happiness it would be counted as correct. But if the child produces a word in the sadness category but the target word category was happiness it would be counted as incorrect.

+ = Correct (production and target word match)

- = Incorrect (production and target word do not match)

Time of Production – Write the exact time in the clip that the emotion word is produced (e.g., 18:42).

Type of Production – Write the amount of support that is required in order to elicit each emotion word produced:

**Spontaneous (S):** The participant produces the emotion word without any modeling or cueing from the clinician. This also includes when the participant is looking at a book and produces the emotion word without reading it, being asked a question, or being cued in any way.

**Cued (C):** Emotion words produced after phonological cues (e.g., the clinician says “/s/” in order to elicit “sad”), semantic cues (e.g., “He fell in the water, he is not smiling, he looks \_\_\_.”), closed cues (e.g., “The boy is feeling \_\_\_”), or gestural/visual cues (e.g., using pictures of faces expressing emotions, like a frowny face; emotion words that are seen printed in a story and read) are coded as cued productions.

**Question (Q):** The child produces the emotion word following a question (e.g., “How is the boy feeling?”). The question does not need to be specifically about emotion, but produces an emotion word following any question asked by the clinician (e.g., “What is the boy doing?” and “What did she bring you?”). If the clinician gives two choices (e.g., “Is the boy sad or happy?”) and the child picks in answer that is counted as a question.

**Repetition/Imitation (R):** The clinician produces an emotion word and within the next five seconds, the child repeats it (or a simplified form of it). If either the clinician or child produces other verbalizations before the child repeats the word, it is not counted as a repetition. If the clinician gives two choices (e.g., “Is the boy sad or happy?”) and the child picks an answer that is **not** counted as a repetition.

Correct Valence vs. Incorrect Valence – Valence is considered correct if the word produced matched the valence of the intended word. Words produced of a different valence as the intended word are considered to have incorrect valence (e.g., saying “happy” instead of “sad” is incorrect valence because the two are positive and negative; saying “mad” instead of “sad” is correct valence because the two are both negative. Surprise can be positive or negative depending on the context. If the character or child is coming out better than he or she started, than the valence is positive. If the character or child is coming out worse than he or she started, than the valence is negative).

+ = Correct valence

- = Incorrect valence

Specificity—Specificity is considered correct if the word produced is correct and appropriately specific in the context. It is considered incorrect if the emotion word is inappropriate in the context or if the word is correct but not specific (“not happy” for “sad”).

+ = Correct specificity

- = Incorrect specificity

Overextended – Any emotion word that is overextended to situations will be noted. If the child says ‘happy’ for any situation where there is an emotion word needed, ‘happy’ is being overextended. If the emotion word produced by the child is not being overextended, than this column may be left blank.

## Special Coding Considerations

Code the following:

1. Specific names for emotions (e.g., sadness, happiness, anger, etc.)
2. Adjective forms of emotion words (e.g., excited, scared, annoyed, etc.)
3. The verbs *like*, *love* and *hate*
4. Words describing facial expressions associated with specific emotions (e.g., “She feels *frowny*” Or “That’s a *scary* face”)
5. Verb forms of emotion words that are produced in a way to elicit emotion (e.g., to excite, to surprise, to frighten, etc.)
6. Child’s response is phrased as “feels \_\_\_\_\_” or when the child answers the question “how does he feel?”

Do not code the following:

1. Adjectives describing actions or appearances (e.g., funny, cute, silly, weird, etc.)
2. Expletives and interjections (e.g., Whoa! Hey! Dang it, etc.)
3. Apologies and “sorry”
4. Crying, in pain, laughing, smiling, determined

If the child reads the emotion-based word aloud or asks, “How do you spell (emotion word)”, the production is not coded.

If the child produces the same emotion word multiple times in succession, the number of emotion words coded will depend on the situation. If the child is repeating the same word but in response to different contexts, continue to code each repetition (e.g., “sad” turn page “sad”). However, if the child is repeating the emotion word in regards to the same context, code only the first repetition (e.g., while looking at the same page, “sad, yeah sad.”)

If the emotion word produced is the repetition of the clinician’s production, valence does not need to be coded.

For productions such as “not (emotion word) or “don’t (emotion word)” (e.g., “I’m not happy” or “I don’t like oranges”), judge the emotional category based on the context of each individual utterance.

For questions about what should or should not be considered an emotion-based word and which emotional category each word belongs to, refer to the appendix of emotion words compiled by Johnson-Laird and Oatley (1989).

## APPENDIX D

**Consent to Take Part in Research**

DEPARTMENT OF COMMUNICATION DISORDERS  
 BRIGHAM YOUNG UNIVERSITY  
 136 TAYLOR BUILDING  
 PROVO, UTAH 84602-8605  
 (801) 422-4318 FAX: (801) 422-0197



## Parental Permission Form

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

**Procedures:** I am asking you to enroll your child in a 12- to 14-week intervention study. During this time your child will be enrolled in intervention that will focus on teaching social communication skills. The goal will be to help your child interact more appropriately with peers and adults. Therapy will be provided by a combination of BYU graduate students in Communication Disorders and your child's school clinician. All treatment will take place at your child's school. There will be two or three treatment sessions per week, each lasting about 30 minutes. All treatment sessions will be video recorded. These sessions will work on helping the child to understand better the emotional responses of others. All treatment sessions will take place during the regular school day. In addition, your child may be given additional testing to make sure that he/she meets the study criteria. Some of this testing is likely to already have been done but it not it may take an additional two hours of time to complete. If the testing has already been done, we would like to request your permission for the school clinician to make this information available to us. All treatment session will be video recorded to allow researchers to analyze the effectiveness of the treatment. The recordings will be erased following completion of the analyses.

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

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

**Benefits:** The primary benefit to your child is the potential growth resulting from receiving intensive intervention during the course of the study. There are benefits to society in general

in that this study may result in more effective treatment methods for children with social communication problems.

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

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

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

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

#### Questions about your Rights as a Research Participant

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

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

Printed Name \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

#### Video Release Form .

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

1. \_\_\_\_\_ The videotapes can-be studied by the research team for use in the research project. .
2. \_\_\_\_\_ Short excerpts from the videotapes can be shown at scientific conferences or meetings.
3. \_\_\_\_\_ Short excerpts from the videotapes can be shown in university classes.

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



Printed Name \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

THE EDUCATIONAL PROGRAM IN SPEECH-LANGUAGE PATHOLOGY IS ACCREDITED BY THE  
COUNCIL ON ACADEMIC ACCREDITATION OF THE AMERICAN SPEECH-LANGUAGE-HEARING ASSOCIATION