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Alternating Treatments for Idiom Interpretation by Children with Specific Language Impairments

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ABSTRACT

Purpose: The aim of this study was to examine the effect of two idiom interventions by students with Specific Language Impairment (SLI). Idioms are linguistic expressions that have figurative meanings other than their literal interpretation. There is a strong correlation between idiom interpretation and academic success (Nippold & Martin, 1989). Students are exposed to idioms in media, in school, literature, and in daily interactions with peers and adults (Nippold, Moran, & Schwarz, 2001).

Method: Three school-aged students (n=3) with SLI ages 11;9–13;8 (mean age = 12;8) were provided a language intervention for idioms embedded in stories with pictures (n=10) and without pictures (n=10). All participants were tested and treated in their home environments. The Clinical Evaluation of Language Fundamentals Sentence Recall subtest, One Word Vocabulary Word Test, and Clinical Evaluation of Language Fundamentals Metalinguistic Figurative Language subtest were administered as well as Verbal Explanation Probes, Comprehension Probes, and Generalization Probes. A Single Subject Experimental Design (SSED) tracked performance. Visual analysis and PEM determined the participants' determined response to treatment.

Results: All participants were better able to explain, understand, and generalize idioms following intervention. However, participants responded to one or the other visual cue individually. Direct, explicit instruction improved the results of the participants.

Discussion: Idioms are a figurative language form that are frequent in academic and social contexts of children with SLI. Children with SLI potentially respond well when given repeated

exposures to figurative language forms, and can take advantage of visual cues to disambiguate their meanings, map and retain their forms.

Key Words: idiom, intervention, semantics, SLI, scaffolding

CHAPTER I

INTRODUCTION

Idioms are linguistic expressions that have figurative meanings other than their literal interpretation (Huber-Okrainec & Dennis, 2003; Tabossi, Fanari, & Wolf, 2005). They are single semantic units akin to single lexical items (i.e., a word). Examples of idioms include *it's raining cats and dogs (figurative meaning = raining hard), nuts about you (figurative meaning = likes you a lot), skating on thin ice (figurative meaning = potential danger),* and *hitting the books (figurative meaning = studying hard).* Idioms are considered the most frequently used form of figurative language such as metaphors, similes, and proverbs (Brinton, Fujiki & Mackey, 1985).

Background of the Problem

Idioms contribute to communicative competence in academic and social contexts (Secord & Wiig, 1993). In fact, research indicates a strong correlation between idiom understanding and academic achievement (Nippold & Martin, 1989). School aged children are exposed to figurative language in the classroom, through the media, as part of read literature, as well as peer and adult social communication (Nippold, Moran, & Schwarz, 2001). Between six and ten percent of sentences in children's reading books contain idioms (Cain, Oakhill, & Lemmon, 2005). Six percent of sentences in third grade literature contain an idiom and this ratio increases to ten percent of sentences by the eighth grade (Nippold, Moran, & Schwartz, 2001). Lazar, Warr-Leeper, Nicholson, and Johnson (1989) reported that 11.5% of classroom teachers' verbal utterances contain idiomatic expressions (Qualls & Harris, 1999). At the kindergarten level, five percent of classroom teachers' utterances directed to their students contained at least one idiom.

By grade 8, teachers' utterances contain 20% of idioms (Nippold, Moran, & Schwarz, 2001). It would seem then that one aspect of academic success and social acceptance is the ability to interpret idioms. As such, they are important for communicative competence including oral and written language (Secord & Wiig, 1993).

The Individuals with Disabilities Education Act of 2004 (IDEA) guides schools to help qualify students for special education services and ensures meeting the Common Core State Standards (CCSS; National governors Association Center for Best Practices & Council of chief State School Officers, 2010) in 42 of 50 states to set goals for students (CCSS, 2016). According to ASHA, 90% of SLPs who are employed in public schools service children with the diagnoses of language disorders (ASHA, 2016). Students with language impairments are one of the largest groups of children with communication disorders served by SLPs in the schools (ASHA, 2017). Tomblin et al., (1997) report that language impairment is the most common childhood communication disorders affects 7.4% of children (6% for girls and 8% for boys). Therefore, within this scope, it would behoove educators to ensure that school children learn to effectively and efficiently interpret idioms.

Children with Specific Language Disorders

A specific language impairment (SLI) is defined as "significant limitation in language ability, yet the factors that usually accompany language learning problems such as hearing impairment, low non-verbal intelligence test scores, and neurological impairment are not evidenced" (Leonard, 2000). According to the DSM V, the criterion includes the following (page 142, APA):

A. Persistent difficulties in the acquisition and use of language across modalities (i.e., spoken, written, sign language, or other) due to deficits in comprehension or production that include the following:

1. Reduced vocabulary (word knowledge and use).

2. Limited sentence structure (ability to put words and word endings together to form sentences based on the rules of grammar and morphology).

3. Impairments in discourse (ability to use vocabulary and connect sentences to explain or describe a topic or series of events or have a conversation).

B. Language abilities are substantially and quantifiably below those expected for age, resulting in functional limitations in effective communication, social participation, academic participation, academic achievement, or occupational performance, individually or in any combination.

C. Onset of symptoms is in the early developmental period.

D. The difficulties are not attributable to hearing or other sensory impairment, motor dysfunction, or another medical or neurological condition and are not better explained by intellectual disability (intellectual development disorder) or global developmental delay.

Typical Language Development in School-Aged Children

Typical school-aged children learn between 2,000 and 3,000 new words each year or 5 to 8 words per day (Nagy & Scott, 2000). By the time a student graduates high school, it is estimated that the student should know approximately 40,000 different words upon graduating high school (Nagy & Herman 1987). Children learn new words first through spoken language in early

childhood and early elementary school years but written language becomes a significant source of learning new words in fourth grade (ages 9-10) as another source of lexical learning (Nippold, 2007). Word learning continues into adulthood by people particularly for people who are active, proficient readers (Miller & Gildea, 1987). Sophistication of word learning develops along a continuum as a 5-year old may label an animal such as *barks* but a 9-year old may use a more specific subordinate such as *poodle* or a superordinate as *dog* to represent a semantically related word (Nippold, 2007).

Lexical-Semantic Representation - Connections

Words are forms and meaning making connections in the brain through share semantic relations (Sheng & McGregor, 2010). Every node (or information unit) is connected to another node either stimulates (i.e., activates) other nodes or inhibits them. For example, the word *hand* may spread activation to other words through semantic connections such as arm, finger, thumb, leg which also belong to the thematic category of *hand.* The more *hand* is activated within a rich semantically-related context, the stronger the connections between related nodes are, as well as the nodes themselves are strengthened. Concurrently, unrelated connections and nodes are quieted or inhibited further. Frequent exposures to semantically-related connections and nodes build a stronger semantic network that helps attain stronger connection to the lexical form – the word for later use and retrieval. Retrieval of words is directly affected by the richness of meaning stored in memory (Capone & McGregor, 2005). The more children know of a word, the more likely they will retrieve it from memory for naming and for generalization (Capone & McGregor, 2005; Capone Singleton, 2012; McGregor, Newman, Reilly, & Capone, 2002).

Neural Processing of Idioms

Masha, et al., (2008) examined the role of the left and right hemispheres in idiom interpretation using functional Magnetic Resonance Imaging (fMRIs). Literal interpretations were processed faster than the figurative interpretations. The data showed that "processing the idiomatic interpretation of idioms and the literal interpretations of literal sentences involved left hemispheric regions whereas processing the literal interpretation of idioms was associated with increased activity in right brain regions which include the right precuneus, right middle frontal gyrus (MFG), right posterior middle temporal gyrus (MTG), and right anterior superior temporal gyrus (STG)" (Masha, Faust, Hendler, & Beeman, 2008). It suggests that the right hemisphere areas play a role in semantic ambiguity in processing idioms.

Furthermore, Hiller & Buracas (2009) examined the neural correlates of spoken idiom comprehension with fMRI study for a rapid sentence decision tasks using idioms. The results showed that there was neural activity in the left ventral dorsolateral prefrontal cortex, which involved two different clusters. Those clusters involved Brodmann areas 44 and 45 and adjacent regions 11 and 47. The other cluster involved the superior and medial frontal gyrus (Broca's areas 8 & 9). There was mainly a left sided preference for interpreting the linguistic nature of the idioms presented.

Word Learning and Explicit Instruction

Word learning leads to semantic representation of a new concept or label. Semantic representation in memory leads to future retrieval for recall when needed (Capone-Singleton, 2012, Capone & McGregor, 2005). Existing vocabulary size, richness of extant semantic storage

ability to fast map, and phonological memory are predictors of word learning performance (Sheng & McGregor, 2016).

The use of context clues is often useful when students are learning new vocabulary to help understand its meaning in either spoken and/or written communication (Nippold, 2007, p. 30). This method has been used throughout the school years in a student's academic life. The initial exposure to a new lexicon is referred to as "fast mapping" (Nippold, 2007, p. 30). However, the student may or may not understand the meaning of the lexicon at this juncture. Therefore, it is often necessary for more explicit instruction to increase the frequency of exposure to these lexicons. "Slow mapping" refers to the exposure after the initial exposure to the new concept or vocabulary which occurs over a period of time and are strengthened (Capone, 2012). To increase the student's ability to fully understand new words, the use of context clues and frequency are critical (Nippold, 2007). Students who receive explicit, engaging vocabulary instruction will experience vocabulary growth (Tomesen & Arnoutse, 1998; White, Graves, & Slater, 1990). Explicit instruction of vocabulary words is critical for students in upper grades as more word meanings are obtained from reading (Archer, 2012). It is even more critical for explicit, direct instruction for vocabulary when students present with reading difficulties (Beck, McKeown, & Kucan, 2002). Idioms are considered "semantical units" which are based on a string of specific words that cannot be changed. Therefore, it would seem appropriate to treat idioms as teaching new lexicons in direct, explicit instruction for students to build their available vocabulary base.

Working Memory

Working memory refers to the structures and processes used to temporarily store and manipulate information which is important for word learning (Vugs, Hendriks, Cuperus, Knoors, & Verhoeven, 2017).There are three systems in the working memory model in the central executive (CE) system according to Baddeley (2003): the phonological loop, the visuospatial sketchpad, and the episode buffer. The CE controls and coordinates the working memory. The phonological loop and visuospatial sketchpad are responsible for the temporary storage of verbal and visuospatial information. The episodic buffer binds the information from multiple sources to combine into chunks (Baddely, 2003). Working memory begins in the first years of childhood and is expected to peak into young adulthood. In children with SLI, there appears to be difficulties with working memory and word learning or increasing available vocabulary (Vugs, et al, 2017). Many children with SLI demonstrate working memory deficits as compared to their same-aged peers (Montgomery, Magimairaj, & Finney, 2016). There appears to be a strong correlation to word learning and mapping sound to meaning, There also is evidence that there is a significant link of a deficient phonological short term memory (pSTM) through adolescence into adulthood (Atkins & Baddeley, 1998). This could lead to poor word learning as well as idiom learning in middle school and high school years as well as college or vocational training.

Statement of the Problem

Children with specific language disorders make up 7% of the school-age population. (ASHA, 2016). Idiomatic language is evidenced in social, academic, and vocational contexts. Children that present with language disorders most likely will have difficulties with social, vocational, and

academic communication (McLaughlin, 2006). It is important that children with language impairments develop a rich semantic network, strengthen working memory and use explicit instruction to learn idioms as there are many students with specific language impairments.

Purpose of the Study

The purpose of the current study was to determine which treatment model is more effective in teaching children with SLI idiomatic expressions using visual scaffolds: (a) stories embedded with the idiom and its' meaning with pictures or (b) stories embedded with the idioms and its' meaning without pictures.

Research Questions

The purpose of the current study was to determine which treatment model is more effective. This study addressed the following questions:

RQ1. Will children with SLI benefit from written description as a scaffold in addition to stories in learning idioms?

- Dependent variables
    a) Comprehension probes
    b) Verbal expression probes
    c) Generalization probes

RQ2. Will children benefit from pictures as a scaffold in addition to stories in learning idioms?

- Dependent variables

a) Comprehension probes

b) Verbal expression probes

c) Generalization probes

RQ3) Will children with SLI generalize idioms in untreated stimuli following idiom treatment?

- Dependent variables

a) Comprehension probes

b) Verbal explanation probes

Research Hypothesis:

Children with SLI will benefit from one of two different visual scaffolds: (a) enrich semantic learning) and (b) free resources for verbal memory processes for learning.

Chapter II

REVIEW OF THE LITERATURE

There has been significant research in idiom development in school-aged children. Although there is no current data as to when children begin to interpret idioms accurately, studies have shown that this process of idiom development continues well into adulthood (van Kleeck, 1994). According to Milosky (1994) developmental data is largely dependent upon the specific idiom and the task that the comprehension interpretation is assessed. For example, there are a multitude of methods such as verbal expression, reading comprehension, and auditory comprehension. Although there is no current data as to when children begin to interpret idioms accurately, studies have shown that this process of idiom development continues well into adulthood (van Kleeck, 1994). Methods used in assessing idiom knowledge including a description of the method used, the outcomes, the limitations of each study, as well as a critical assessment of the methodologies. This information will be presented in table formats for ease of reviewing these research studies followed by a summary of the literature review.

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Table 1. *Presentation of idioms in various language modalities*

Oral Isolation	Written Isolation	Oral Story Context	Written Story Context	Picture & Written Idiom
	Abrahamsen & Smith (2000): Computer condition & Classroom condition, both used sentence strips	Abrahamsen & Smith (2000): Classroom condition & Computer condition		Abrahamsen & Smith (2000): Computer condition
		Brinton (1985)		
	Cacciari & Levorato (1998)			
	Caillies & Butcher (2007): Experiments 1 & 2: on computer screen			
	Cain, et al., (2005)		Cain, et al., (2005)	
		Huber-Okrainec & Dennis (2003)		Huber-Okrainec & Dennis (2003)
	Laurent, et al, (2006)			
	on a computer screen			

Levorato & Cacciari (1999) Experiment 2	Levorato & Cacciari (1999) Experiment 2	Levorato & Cacciari (1999) Experiment 1	Levorato & Cacciari (1999) Experiment 1
		Levorato & Cacciari (1995) Experiments 1, 2, & 3	Levorato & Cacciari (1995) Experiments 1, 2 & 3
	Nippold & Duthie (2003) Mental Imagery Task		Nippold & Duthie (2003) Idiom Comprehension Task
	Nippold & Martin (1989)		Nippold & Martin (1989)
	Nippold, Martin, & Schwarz (2001)		Nippold, Martin, & Schwarz (2001)

	Nippold & Rudzinski (1993) Experiment 1		Nippold & Rudzinski (1993)
Nippold & Taylor (2002			Nippold & Taylor (2002)
			Nippold & Taylor (1995)
Norbury, 2004		Norbury (2004)	
			Qualls & Harris (1999)
	Qualls, et al (2003)		Qualls, et al
			(2003)
		Tabossi, Fanari, & Wolf (2005) Experiments 1 & 2	Tabossi, Fanari, & Wolf (2005) Experiments 1 & 2

In Table 2, oral assessment methods were used in idiom interpretation. Several presentation models were used. *Oral isolation* refers to the presentation of an idiom spoken orally to the participant. *Written isolation* refers to the presentation of an idiom presented in print form. *Oral story context* refers to a verbal presentation of a four- sentence paragraph written at a 3rd grade reading level read by the examiner. The idiom was contained in the last sentence. *Written story context* refers to a written presentation of a four-sentence paragraph written at a 3rd grade reading level read by the participant. The idiom was contained in the last sentence. *Picture and written idiom* refers to a visual image or picture that is a literal representation of the idiom presented in written form. Based on the research studies, it appears that most of the studies were completed by asking students from various grade levels to interpret idioms and students learned idioms best when presented in context form. Explanation was a more difficult task for the students than identification.

Table 2. *Oral assessment methods used in idiom interpretation.*

Study Citation	**Dx**	**Participants/ Age (Years)**	**Stimuli Task**	**Outcomes**
Abrahamsen & Smith, 2000	CI	9 Ages Unknown	One idiom was taught in the classroom group. Eight idioms were taught for an 8 week period including role playing and discussion	Classroom method was more effective than the computer method.
Brinton, Fujiki, & Mackey, 1985	Typ	20 K 20 2nd graders 20 4th graders 20 6th graders	Stories were read orally to students individually that contained an idiom at the end of the story. Participants were asked to choose a picture that best identified the meaning of the idiom.	Accuracy levels were as follows: K: 22% 2nd Grade: 44% 4th Grade: 56% 6th Grade: 62%
Cain, Oakhill, & Lemmon, 2005	Good vs. Poor Reading Comprehenders	N= 28 9-10	Idioms in isolation were read to participants. Participants were asked to indicate if the idioms were familiar or not and explain what it meant. Then, idioms were presented in contextual	Good and poor reading comprehenders did not differ in interpretation of transparent idioms in context but poor reading comprehenders were much worse at using context to

				stories read orally to them. Participants were asked to explain the meaning.	understand the meanings of the idioms.
Levorato & Cacciari, 1999	Typical	N=30 7 9		Examiners read a small narrative to the students that contained an idiom at the end of the story. Participants were asked to select a literal, figurative, or associate response	7 year olds and 9 years olds were more sensitive to receiving more information context than in isolation. The 9 year olds performed better than the 7 year olds in both tasks.
Levorato & Cacciari, 1995	Typical 3 Experiments	N=90	a. 7-8 9-10 b. 6-8 9-10 c. 7-8 9-10	Experiments A & B: Examiners read 5 stories to students that contained an idiom at the end of the story. Experiment C: Same 5 stories were read to students but the idiom was omitted at the end of the story and replaced with a series of dots "the captain fell from the …"	All children were able to recall the conclusion of the story in Experiment A with the older students performing better. Older students chose more idiomatic responses and produced more idiomatic phrases than younger children. The idiomatic competition is not yet developed in younger children and is only partially developed in older children.

Lodge & Leach, 1975	Typ	20 6 y.o 20 9 y.o 20 12 y.o 20 18-25	Subjects were read phrases and given 4 pictures to choose from. The types of pictures that were represented included the literal meaning, idiomatic meaning, literal variation, and idiomatic variation	At age 6, children applied a "literalization strategy". Active versus passive sentences were poorly understood by 6 year olds. Stead increases were noted for ages 9, 12, and adults for active and passive phrases.

Table 3. *Written presentation methods used in idiom interpretation.*

Study Citation	**Dx**	**Participants**	**Stimuli Task**	**Outcomes**
Cacciari & Levorato, 1998	Typ	45 10-11 15 University Students	Participants were asked to perform 3 operations with 9 idioms consisting of transparent, opaque, and quasimetaphorical). 1. Participants were asked to write a paraphrase of the idiom meaning. 2. Explain the origin of the idiom. 3. Rate on a 7 point scale it is was more literal or mental to the figurative meaning of the idiom.	Children's explanations were more frequent for quasi-metaphorical idioms and less for transparent and rare idioms Adults are more sensitive to semantic analyzability. Adults used more analogies for explanations of idioms. Adults considered strategies for figuring out idioms according to the type of idiom used.
Caillies & Butcher, 2007	Typ	54 Undergrad 66 Undergrad University students	32 French idiomatic expressions were used. 16 were decomposable and 16 were nondecomposable idioms. Two experiments were conducted. In experiment 1, participants	An EXPE6 program was used and participants were instructed to read each sentence in a fixed time. Decomposable idioms were understood earlier than indecomposable

			were asked to read a sentence and then perform a lexical decision task to the target letter string. In experiment 2, highly familiar and highly literal idioms were used.	idioms. There was a clear processing difference in time of 500 msec after reading for decomposable and nondecomposable idioms.
Levorato,1993	Typ	8 year olds 11 year olds	Three experiments were conducted. Participants were asked to complete a narrative with a small set of possibilities. Three types of answers could be produced: exact wording, adaptation, and figurative completions of the idioms.	The choice of the response for idioms was determined by the participants' ability to process the linguistic information surrounding the linguistic information surrounding the idiom and to identify the best response in a given context. Eleven-year old participants' responses were more common than the 8-year-old responses.
Nippold & Duthie, 2003	Typ	40 - 12;3 year olds 40 - 27;0 year olds	Twenty idioms were presented in written story contexts. Ten idioms were opaque, and ten were transparent. Participants were asked to describe	Children produced a greater percentage of irrelevant images than adults who produced figurative images for the idioms. Transparent idioms

			mental images and write their responses. Participants were asked to interpret idioms and choose from a multiple-choice format.	were easier to understand than opaque idioms.
Nippold, Moran & Schwartz, 2001	Typ	50 - 11;8-12;11year old	12 English idioms consisting of 4 word verb phrases such as "blow away the cobwebs" were used. Stories were written at a 3rd grade reading level. The Idiom Comprehension Task was a written, multiple choice task where each idiom was presented within a short story context	Familiar idioms were easier to understand than unfamiliar ones. Participants who were better at reading and auditory comprehension performed better.
Nippold & Rudzinski, 1993	Typ	20 17;5 20 18;11	Participants were asked to judge familiarity of 100 four word-idioms and then judge how frequently they heard or read the expressions. Of these 100 expressions, 24 idioms were chosen based on high, moderate, and low familiarity.	Once the 24 idioms were chosen, participants were asked to answer a multiple-choice question following a 4-sentence paragraph. High familiar idioms were the easiest to understand. Transparent idioms may be learned as a dissecting
	Typ	50 10-11 50 13-14		

		50 14-17-		strategy.
Nippold & Taylor, 1995	Typ	50 10-11 50 13-14 50 15-17	24 different idiom expressions were used in a brief story context. Eight idioms were used for familiarity including high, moderate, and low. Transparency ratings ranged from high to low. Test problems were written at a 3rd grade reading level. Participants were assessed in a large group fashion. The examiner presented a brief description of idioms and presented the participants with 3 practice problems similar to test problems.	Familiarity: High, Moderate, Low: Grade 5: 71, 58, 45% Grade 8: 89, 76, 59% Grade 11: 95, 84, 69% Transparency: Grade 5: r = .48 Grade 8: r = .51 Grade 11: r = .53
Nippold & Taylor, 1995	Typ	50 10-11 50 16-17	Twenty familiar English idioms were used and they were all 4 word verb phrases a. Familiarity Judgment Task b. Idiom Comprehension Task read in a short	Idioms were higher in familiarity with 16 year olds and they comprehended with greater accuracy at 84% than 11 year olds at 73%. There was no difference for the transparency rating for

				paragraph c. Transparency Judgment	each group.
Qualls & Harris, 1999	Typ European Americans and African American participants	48	10;9-10;10	24 Short stories containing 24 idioms and 4 corresponding response questions written at a 3rd grade level. Participants were asked to read the stories and answer the questions	Results indicated a significant group effect for low familiarity idioms with the performance of European Americans superior to African Americans
Qualls, et al., 2003	Typ and Atypical reading comprehenders	95		The Idiom Comprehension Test was used which consisted of 24 short stories containing an idiom in each story. Each story was followed by a multiple choice and was written at a third grade reading level. Three conditions were given: idioms in a story, idioms presented in isolation, and idioms in a verification task.	There were significant correlations between rankings of reading and overall performance in the story and verification condition but not the isolation condition. High proficiency readers performed better than low proficiency readers.

Legend: K = Kindergarteners; CI = Communication Impaired; Typ = Typical

Table 3 Written Presentation Methods demonstrates the various studies that were various modalities in which idioms have been presented in various language modalities that include oral isolation, written isolation, oral story context, written story context, and picture/written isolation. These are all presented in a language format. Various ages were used in the different modalities for each research study for typically aged participants. In Table 2, studies represented the oral presentation of idioms while Table 3, studies represented the written presentation of idioms. In all the studies conducted thus far in the research literature, there have not been any studies that demonstrate how participants would perform if the idioms were presented with non-linguistic assessment presentations such as gestures, pictures, and/or drawing. For example, would a participant with a specific language impairment perform better if a visual image was presented to determine if the participant understands the idiom? If a participant presents with language deficiencies, is it truly a valid measure to assess the interpretation of an idiom via an already impaired system whether it be oral language or reading comprehension? It may be beneficial to assess if a non-linguistic treatment can help students who are linguistically impaired learn idioms. More so, many of these studies were performed on typically developing participants. However, several studies (Cain, et al., 2005; Qualls & Harris, 2003) indicated that poor reading comprehenders clearly performed worse than their good reading counterparts. Is it fair to say that the poor reading comprehenders did not understand the meaning of the idioms due to poor linguistic reading skills or due to other possible reasons? Perhaps, it would behoove researchers to assess idiom comprehension via non-linguistic measures to determine if it is a linguistic deficit that interferes with the ability to learn what an idiom means. If we were to devise a better method

of teaching figurative language such as idioms using methods other than linguistics or as an adjunct to linguistics, would students with language impairments learn figurative language more efficiently? It would seem that we might want to reconsider our teaching methods by exploring other sensory modalities that may increase learning language particularly figurative language with visual images that may tap other parts of the brain other than language. The next section will discuss the only research that has been conducted in the attempt to teach idiom comprehension using various modalities.

Factors that Influence Idiom Interpretation

There are three factors that influence idiom interpretation. These are (1) the analyzability of an idiom, (2) the frequency of occurrence of an idiom, and (3) the contextual support surrounding an idiom.

Semantic Analyzability of Idioms

Semantic analyzability is the extent to which an idiom's meaning can be gleaned by analyzing its individual words (Levorato & Cacciari, 1999). Idioms can be transparent or opaque in terms of their analyzability, or decomposable and noncomposable. Each of these terms (analyzability, decomposability, transparency) refers to the ease with which an idiom's figurative meaning can be discerned from its individual parts (Abrahamsen & Smith, 2000; Cacciari & Levorato, 1998; Caillies & Butcher, 2007; Cain, Oakhill, & Lemmon, 2005; Gibbs, 1991; Levorato & Cacciari, 1999; Nippold & Duthie, 2003; Nippold & Taylor, 2002). Decomposable idioms are considered dead metaphors (e.g., *it's raining cats and dogs*). They are "dead" because they evolved into fixed expressions taking on new meanings (Gibbs, 1991). For example, the expression *it's raining cats and dogs* which means to 'rain heavily' actually originates to the 17th and 18th centuries in England when many cats and dogs drowned in torrential rainstorms. Their bodies were found floating in the streets and it seemed as if their bodies had fallen from the rain in the skies (Terban, 1996). A decomposable idiom can be dissected to further analyze the figurative meaning (e.g. *lay down the law*). *Lay down the law* means to scold or give strict orders, and the word *law* within the phrase can hint towards its meaning. Also, *put your foot down* which could

be seen as an authoritative figure as being stern and literally putting his or her foot down while making a specific point.

A non-decomposable or opaque idiom cannot be broken down into parts that make it difficult to decipher the meaning if not explained previously (*kick the bucket*). *Kick the bucket* means "to die". If one was to try to figure its meaning, the words "kick" and "bucket" do not have anything to do with death which would lead to confusion for the listener or reader if attempting to break down its components. An opaque idiom is not interpretable from its individual words. For example, *throw in the towel* or to give up. It would be more difficult to analyze these words as *giving up*. Non-decomposable idioms can be stored in memory as a lexical item; whereas, decomposable or opaque idioms are often processed in the literal sense and eventually emerge as a figurative expression.

Gibbs (1991) studied 80 children (20 students each in kindergarten, first grade, third grade, and fourth grade) for their ability to interpret normally decomposable and non-decomposable idioms. There were two lists of ten stories consisting of these types of idioms. The results indicated that children found it easier to interpret normally decomposable idioms than non-decomposable idioms (Gibbs, 1991).

Cacciari and Levorato (1998) conducted a study of 45 children between the ages of 10;3-11;2 and 15 university students. The school-aged children attended a primary school in Reggio Emilio, Italy and the adult subjects attended the University of Bologna. The socioeconomic status was middle-class families, and there were an equal amount of male and female subjects in both age groups. Three different types of idioms were used: quasi-metaphorical, transparent and opaque. Quasi-metaphorical idioms typically demonstrate a most transparent expression and are

easiest to paraphrase and explain such as *feeling like a caged animal.* If one feels *like a caged animal*, he or she is most likely to feel constrained. Nine idioms were presented in written form in booklets, and they were asked to perform three operations: (1) to write a paraphrase of the meaning of the idiom; (2) explain the origin of the idiom; and (3) rate on a 7 point Likert scale if the idiom was easier to interpret. Children's explanations were frequently correct for idioms that were more transparent. When compared to the children, the adult subjects were more sensitive to semantic analyzability, and they often used strategies for deciphering the meaning of the idiom such as using analogies for the explanations of idioms. The results indicated that the explanations for quasi-metaphorical idioms were the easiest to explain and interpret for children and adults. Transparent idioms were second easiest to decipher, and the opaque idioms were the most difficult for both age groups. The adult subjects considered the children's ability to understand idioms judging that quasi-metaphorical idioms are the clearest, followed by transparent and then opaque idioms. When the adults were asked what types of strategies children may use to interpret idioms, the adults postulated that some of the literal meanings of the words could help provide better understanding of the idioms (Cacciari & Levorato, 1998).

In Nippold and Duthie (2003), twenty idioms were presented in story contexts to 40 school-aged children with a mean age of 12;3 and 40 adults with a mean age of 27;0. Ten of the idioms were opaque, and ten of the idioms were transparent. The familiarity and transparency ratings of the expressions used in the study were based on the judgments of adults in a previous study conducted by Nippold and Taylor (2002) and Nippold and Rudzinski (1993). Subjects were asked to describe mental images and provide written responses for the twenty idioms provided. They were also asked to choose from a multiple-choice format in the interpretation of the idioms.

A greater percentage of irrelevant images produced by children than adults for figurative images of idioms were evidenced. The transparent idioms were easier to understand than opaque idioms for both children and adults. As the chronological age increased, the mental images were more accurate. Transparent idioms received higher imagery scores than opaque idioms for children and adults. It was also interesting to note that even adults did not demonstrate complete mastery of idiom knowledge (Nippold & Duthie, 2003).

Caillies and Butcher (2007) studied processing time for normally decomposable and non-decomposable idiomatic expressions. Thirty-two French idioms were equally divided into decomposable and non-decomposable idioms. Sixty-six undergraduate students were studied, and they were asked to read sentences containing idiomatic expressions on a computer. They had to perform a lexical decision task on a target word that reflected its meaning that was measured in 0msec., 350msec., or 50msec. It was discovered that decomposable idioms were understood quicker and activated sooner than non-decomposable idioms (Caillies & Butcher, 2007). These studies as well as other studies clearly indicate that the more semantically transparent or vivid the image is for the idiomatic expression, the easier it is to interpret the meaning. When the words can have some relation to the figurative expression, the listener or reader can break down some of the components to better comprehend its meaning. Performance improved with age. In summary, idioms that are transparent, decomposable, or semantically analyzability are easier to interpret than idioms that are opaque, non-decomposable, or non-semantically analyzable.

Frequency of Idiom Occurrence and Cultural Factors

A measure of how frequently an idiom is used in oral or written language is considered familiarity (Nippold & Rudzinski, 1993; Nippold & Taylor, 1995). Highly familiar idioms are used more frequently than low familiar idioms. A highly familiar idiom may be *chew someone out* which means to scold severely; whereas, a low familiar idiom may be *long in the tooth* which means old or aged. Nippold and Rudzinski (1993) studied 150 children and adolescents ages 11, 14, and 17 on their interpretation of 24 idioms. Eight idioms were used for familiarity that included high, moderate, and low familiarity. The subjects were asked to write the meanings of these idioms which were presented in a story context that consisted of four sentences. The stories were written at a third grade level. The sessions lasted between 35 and 45 minutes. The explanation of idioms gradually improved with age. High familiarity idioms were easier to interpret and showed improvement as with age. Semantic analyzability also played a role in idiom interpretation with more transparent idioms being easier for all age levels. (Nippold & Rudzinski, 1993).

Nippold, Moran, and Schwartz (2001) studied 50 adolescents between the ages of 11;8 to 12;11 years of age from a primary school in Christchurch, New Zealand. The research was designed to determine how preadolescents learned interpretation of idioms. Twelve English idioms controlled for length (four words) were embedded in stories (four sentences) written at a third grade level. The idioms that were selected were based on previous research conducted by Nippold and Rudzinski (1993). The subjects were assessed in a classroom with a written, multiple-choice task. Idiom comprehension was better for more familiar idioms than unfamiliar idioms even with context. Regardless of familiarity, nearly one-quarter of the students performed

significantly lower than their peers for idiom interpretation which suggests that a portion of students who are identified as typically developing language children still have difficulties interpreting idioms (Nippold, Moran, & Schwartz, 2001).

Perhaps the best example of how exposure influences idiom learning is to understand cultural differences in idiom interpretation (Qualls & Harris, 1999; Qualls, O'Brien, Blood, & Hammer, 2003). For example, common Portuguese idioms such as *to give mouth* meaning to emit silly remarks or *to set a foot of wind* meaning to make a scene would be difficult to interpret as an English listener (Botela da Silva & Cutler, 1993). Likewise, regional and cultural differences can experience the same kind of misunderstanding of idioms unique to that particular region, culture or regional-culture (Milosky, 1994). An African American idiom such as *you sure put your foot in that* is meant as a compliment as if *you gave it your best*. Qualls and Harris (1999) studied African-Americans who were not familiar with the European-American idioms. The majority of the African-American students were from West Tennessee, and the majority of the European American students were from Arkansas. In both rural communities, 90% of the students were in the lower socio-economic status. Twenty-four short stories at the third grade reading level contained 24 idioms. Eight stories contained high familiarity idioms, eight stories contained moderate familiarity types of idioms, and the other eight stories contained low familiarity idioms. These idioms were selected from the previous study conducted by Nippold and Taylor (1995). Students were provided with test booklets and were asked to select a correct response out of a field of four choices to correctly identify the meaning of the idiom given. The mean accuracy was 57% for African-American students and 64% for the European American for overall mean accuracy. European Americans and African-Americans identified high familiar

idioms (65%, 56%) and for low familiar idioms (64%, 52%); however, moderately familiar idioms were identified similarly (63%, 64% respectively).

Qualls, et al. (2003) further investigated idiom comprehension of rural adolescents. Rural adolescents are exposed to a different cultural lifestyle than adolescents from suburban or urban area. The language use and needs of rural adolescents may be closely related to the environment in which they live and work which could be farming, coal mines, factories, fishing and hunting. Ninety-five eighth grade students were presented with 24 short stories written at a 3rd grade reading level that contained an idiom in each story. The idioms selected for this study were from the Nippold & Rudzinski (1993) research. There were three tasks: idioms in a story, idioms presented in isolation, and idioms in a verification task. In the verification task, a question was posed containing the idiom. An example of a verification type of question would be, "Does *put their heads together* mean to listen to the other person?" This study used a 3 x 3 quasi-random mixed design with independent variables of condition (story, isolation, and verification) as the between-subjects factor and idiom familiarity (high, moderate and low) as the within-subjects factor. Results indicated that the adolescents from the rural community scored the highest for high familiarity, moderate familiarity, and low familiarity idioms when presented in a story context as compared to isolation and verification tasks. On the high and moderate familiarity in isolation, performance was similar. The subjects performed better on the moderate familiarity idioms for the verification condition (Qualls, et al., 2003). These results illustrate the importance of context on idiom interpretation.

Contextual Support

Like a new word, idiom meanings are best gleaned from the linguistic contexts that surround it. For example, a short story context could include: John was thinking of buying something special for his friend, Susie. He went to the florist and bought roses. He gave the roses to Susie at her house. John's friends say that he is *nuts about her*. This story suggests that John really likes Susie. As can be gleaned from the review thus far, children benefit from contextual supports that surround an idiom (Abrahamsen & Smith, 2000; Brinton, Fujiki, & Mackey, 1985; Cain, Oakhill, & Lemmon, 2005; Gibbs, 1991; Levorato, 1993; Levorato & Cacciari, 1999; Levorato & Cacciari, 1995; Nippold & Duthie, 2003; Nippold, Moran, & Schwartz, 2001; Nippold & Rudzinski, 1993; Nippold & Taylor, 1995; Qualls & Harris, 1999; Qualls, et al., 2003; Waggoner, Palermo, & Kirsh, 1997). As another example, Levorato and Cacciari (1999) evaluated seven and nine year olds ability to understand idioms within a linguistic context. These students were from Reggio Emilia, Italy and were all from middle-class families. Thirty-second graders and thirty-fourth graders were provided with sixteen short stories. Stories were orally read to the students that included an idiom at the end of the story. Subjects were required to choose a response that could be literal, figurative, or associative. Results showed that the younger group benefitted greatly from the linguistic context that was provided more so than the older children. The results of the younger children benefited from both the presence of a rich story context and the level of semantic analyzability of the idioms. The older children also benefitted from semantic analyzability but the results were different. The older children selected a similar quantity of idiomatic responses when non-analyzable idioms were presented in context as compared to the out-of-context presentations. This suggests that linguistic context and semantic analyzability are sensitive to the idiomatic string (Levorato & Cacciari, 1999).

In sum, children more readily interpret idioms if they are semantically transparent from their individual words, they are encountered frequently, and/or they are surrounded by a rich semantic context. In the next section idiom development in children, adolescents, and adults is reviewed.

Idiom Development in School-Aged Children

Currently, there are no data for when children begin producing idioms. Six to eight-year old children begin to accurately interpret idioms but the ability to completely understand all possible idioms in their figurative manner is not even complete by age eighteen. This process continues to develop into adulthood (van Kleeck, 1994). Developmental interpretation is being assessed for such as production, explanation, and recognition (Milosky, 1994). Early studies examined school aged children and adolescents ability to comprehend specific idioms.

Brinton, Fujiki, and Mackey (1985) used six specific idioms to assess the ability of kindergarten, second, fourth, and sixth grade children to determine if they could comprehend the meanings. Indeed, there was an increase in idiom comprehension with age; however, some idioms were difficult (or easy) regardless of age. The idiom *let the cat out of the bag* was understood by few of the children across the grade levels (Kindergarten: 0%; 2nd grade: 0%; 4th grade: 5%; 6th grade: 20%). In contrast, the idiom *lend me a hand* was well understood across the grade levels (Kindergarten: 65%; 2nd grade: 55%; 4th grade: 70%; 6th grade: 75%). Exposure may be at the heart of this trend (Brinton, Fujiki, & Mackey, 1985).

In 1979, Strand and Fraser further investigated the interpretation of idioms in 40 subjects age 5, 7, 9, and 11 years. Twenty idioms were used in sentences and four illustrations were provided with only one correct response within the set of four pictures. As the examiner read the sentence, the subject was asked to choose the correct picture that best identified its representative meaning.

Results indicated that all age groups including the 5 year olds were able to understand some of the figurative meanings while the oldest children understood almost all of them.

Huber-Okrainec and Dennis (2003) created an assessment tool for idiom comprehension for childhood age norms. There were 104 typically developing children aged 6;0-17;8 years of age, and their primary language was English. The subjects were shown four pictures to represent a figurative, literal, unrelated and lexically unrelated meaning for each idiom. The subjects were asked to select the picture that best represented each idiom. Results of the study provide information about the course of idiom comprehension through the school age years for 48 familiar idioms.

Nippold and Martin (1989) researched the idiom comprehension in adolescents. They recruited 475 subjects ranging in ages 14-17 years of age. Twenty idioms were presented in written form, and the subjects were asked to write the meanings for each idiom. Idioms were presented in isolation as well as in a two-sentence story context. The outcome of this study revealed that performance increased when the idioms were presented in story context rather than isolation across the age levels. The 14-year old subjects were 54% accurate for interpreting idioms in isolation and 65% in context while the 17 year old subjects were 67% accurate for interpreting idioms in isolation and 72% in context. This demonstrates that even the 17-year old subjects have not completed the mastery level in isolation or when contextual supports were provided (Nippold & Martin, 1989).

Lodge and Leach (1975) were pioneers in examining idiom comprehension in children and adolescents. Eight subjects aged 6, 9, 12, and 21 years old were administered a task that consisted of ten sentences with idioms. The subjects were asked to choose two of the four pictures that best represented the two meanings that were literal and figurative. Results indicated

that all age groups understood the literal meanings; however, the six and nine year old subjects exhibited difficulties with the figurative representations. The 12-year old group showed that they comprehended many of the figurative meanings but the 21 year old group mastered the ten idioms provided by the examiners (Lodge & Leach, 1975).

In a review of idiom research, Nippold (2007) documented expectations for idiom development for ages 10-25 years. A ten-year old child can be expected to explain the meanings of common, transparent idioms and to be able to use context clues to understand some opaque idioms. At age fifteen, the adolescent should be able to understand difficult opaque idioms. A 25 year old should be able to provide detailed mental images of well-understood images (Nippold, 2007).

Further exploration was conducted in idiom interpretation in the adult population. Brasseur and Jimenez (1989) evaluated the performance of 71 college students from three different age groups: 18-21 years, 22-29 years, and 30-43 years of age. Subjects were presented with twenty idioms and were asked to write their interpretation of the idioms. As the age of the subjects increased, performance improved according to the results of the study. It is apparent based upon this study, idiom comprehension does, indeed, continue to increase well into adulthood (Brasseur & Jimenez, 1989).

Thus far, work shows that children's understanding of idioms precedes their ability to explain them. In addition, children show a steady increase in the figurative interpretations of idioms starting at 6 years of age, but this is not complete by adulthood.

Idioms and Specific Language Impairment

Specific language impairment (SLI) is one of the most common childhood disorders affecting 7.4% of children (Tomblin, et al., 1997). It is defined as an impairment in comprehension and/or

use of spoken, written or other symbol systems which can affect form, content, and/or function of communicative competence in the absence of lower intelligence quotients or concomitant problems (ASHA, 2008; Paul, 2007). Sixty-one percent of practicing speech-language pathologists report that they serviced children with SLI (ASHA, 2008).

There is a dearth of research on idiom interpretation in children with SLI. There is also limited evidence-based research on effective treatment strategies. However, Abrahamsen & Smith (2000) conducted a study of a heterogeneous group of eight students with communication impairments. The purpose of this research was to determine if children with communication disorders are able to learn idioms. More so, they wanted to compare the effectiveness of a computer-assisted instruction method during withdrawal sessions and an in-class method of instruction for the acquisition of idioms for children with specific-language impairments. The subjects were enrolled in a communication disorders classroom in Virginia Beach, Virginia. Age and grade levels of the subjects were not mentioned. All subject's communication disorders were determined to be primarily responsible for the students' lack of academic success in their general education curriculum. The Figurative Language subtest from the *Test of Language Competence-Expanded Edition* (Wiig & Secord, 1989) was administered individually to determine a standard score on the assessment of idioms.

In this study, 16 idioms were selected from a computer program *Common Expressions* (ACA, 1997). There were an equal number of transparent and opaque idioms. During the eight week intervention period, one idiom was taught in the computer condition and one in the classroom condition. Each student learned two idioms: one in the classroom and another on the computer. In the eight weeks, 16 idioms were learned. Eight specific idioms were assigned to the computer condition and eight other idioms were assigned to the classroom condition. The classroom

training session was 20-30 minutes in length and presented once a week to all the subjects in the class. Prior to the actual training, the subjects were asked to define what an *idiom* meant. The students stated that idioms are 'a colorful way to express something'. Then an idiom was introduced to the class on a sentence strip and the class orally read the sentence. The literal interpretation was discussed and demonstrated. Then, the examiners verbally provided the figurative meaning of the expression. Students were coached to role-play the interpretation of the idiom. One of the teachers took two students out of the class to help them learn a script to role-play. As they two students were coached to act out an idiom such as *eat crow*, one student was taught to brag about being the best player or a particular video game and the other student pretended to get a higher score. Then the first student explained he was *eating crow* because he was incorrect and that the other player was better. The two students came back into the class to 'role play' what it means to *eat crow.* At the end of the lesson, students completed a worksheet that contained the idiom in a paragraph from an idiom workbook. Students were asked to answer questions that followed the story with a *yes* or *no* response.

Computer training sessions were conducted individually with the subjects. Each session lasted 15 minutes. Again, the subject was asked to discuss what an idiom was and the response was often 'a colorful way to express something'. A review of the previous week's idiom was also conducted with the examiner explaining the figurative meaning if the subject was unable to recall the meaning. On the computer screen, a picture depicting the literal meaning of the idiom was observed by the subject. The idiom caption was below the picture on the computer screen. If the student was unable to read it, the examiner read it for the subject. Students were asked to consider what the idiom could mean and then the subject pressed a *speak* button that generated a digitized computer response of restating the idiom. The examiner explained the figurative

meaning of the idiom and asked if the subject ever had an experience that could capture the figurative meaning of the idiom. At the end of the session, the student was asked to define or explain that week's chosen idiom that was selected for the computer condition for that week.

Following the eight-week training period, the students reviewed all the idioms that they learned. Each student was given each an idiom and had to explain the figurative meaning. Students were presented with an idiom interpretation task in isolation and in context. The figurative competence subtest of the *Test of Language Competence- Expanded Edition* was administered to the eight subjects (Wiig and Secord, 1989). A two-way analysis of variance that examined the effects of the instructional conditions on the subjects' ability to interpret idioms when presented in the isolation condition demonstrated that condition as a significant factor in determining the number of idioms learned. An interpretation task in both isolation and in context was administered to all students and results indicated that children with SLI learned idioms regardless of computer program or classroom training. The classroom training session did show that it was more effective and had better performances than the computer training. A two-way analysis of variance examining the effects of instructional condition on students' ability to explain idioms when presented in isolation revealed that the condition was a significant factor in determining the number of idioms learned. Post-test scores were significantly higher than pre-test scores. In the computer condition, the overall mean for idioms learned was 1.5 but in the classroom condition, the mean was 3.62. There was no generalization, however, for untrained idioms as measured by the Figurative Language subtest of the *Test of Language Competence – Expanded Edition.*

Cain, Oakhill, and Lemmon (2005) compared 14 children classified as good reading comprehenders and 14 children classified as poor reading comprehenders. Children ranged

between 9 -10 years of age. Of the students that were considered good at reading comprehension, there were 6 girls and 8 boys and of the students who were considered poor at reading comprehension, there were 9 girls and 5 boys. The subjects were from urban schools in the United Kingdom, and the majority of the participants were from lower middle-class families. All spoke British English as their primary language and were Caucasian. Fifty-six idioms were read orally to the students in isolation and in context. The study explored three critical factors in idiom interpretation including familiarity, transparency, and context.

The experimental procedures were presented as idioms in isolation and idioms in context. The subjects were asked to explain the meaning of the idiom when verbally presented with an idiom. Children were tested individually. The idioms in context were presented a minimum of four weeks after the isolation condition. They were provided a verbal story and then were asked a question following the story that would require the subjects to explain the idiom interpretation. In both conditions, items were presented in the same order for each child (real-transparent, real-opaque, novel-transparent, or novel-opaque). Idioms were easier to interpret when presented in context and the good readers outperformed the poor readers. The readers who had poor reading comprehension skills had more difficulties interpreting idioms that were considered opaque and transparent than the subjects for good reading comprehension. This was true for both real and novel idioms that were presented to both groups. Subjects with poor reading comprehension skills also scored lower for interpretation of idioms in the context condition. The authors suggest that this may be accounted for by poor linguistic deficits. In other words, children who are considered good reading comprehenders may have good linguistic skills that could enable them to interpret the idioms as compared to the poor reading comprehenders. Results indicated that when presented in isolation, both the children with good and poor reading comprehension skills

could provide appropriate meanings for some of the transparent idioms. However, subjects with poor reading comprehensions skills scored much lower than their counterparts when using context to decipher the meanings of opaque idioms. With only two studies examining idiom interpretation and learning in children with SLI, further investigation is necessary.

Of all the studies reviewed, only one has examined different methodologies for teaching children with communication impairments. Abrahamsen and Smith (2000) did so but with significant limitations.

Abrahamsen & Smith Intervention Study (2000) study assessed treatment strategies for children with communication difficulties. It addresses presenting information in two conditions: classroom condition and computer condition. The classroom condition consisted of an oral presentation with oral discussion and role playing. The computer condition consisted of visual image of the literal meaning of the literal meaning of the idiom and oral discussion of the idiom with the examiner. Although this study was the first of its' kind in the literature to address treatment strategies for children with communication disorders, it presents with many flaws. Alternative concepts will also be discussed as to how the topic should further be examined and how these concepts could potentially advance treatment fidelity in the area of learning idioms. The rationale will be discussed for each of these changes and how it contributes towards an improvement over the Abrahamsen and Smith (2000) study. The Portney and Watkins (2009) model will be used for planning and executing a solid quantitative research design for a controlled true experiment. A true experimental design involves a particular action or condition known as the *independent variable* and the observed response known as the *dependent variable* that lead to a cause-and effect relationship. It is critical to closely assess issues of an experimental control that is strictly adhered to so that the researcher can have greater confidence

in the validity of experimental outcomes. While there still may leave some doubt, it is the role of the researcher to minimize the confounding effects with the best of the investigator's ability. The experimental method suggests the most convincing evidence of the effect of one variable has upon another (Creswell, 2009). Quantitative methods often use pre-determined instrument based questions, performance data, statistical analysis, and statistical interpretation. Experiments are "based on a logical structure, or design, which the investigator methodically introduces a change into natural phenomena and observes a consequence of a change" (Portney & Watkins, p. 161). In the next section, this study will be further dissected for the study of idiom interpretation with a scientific rationale as to why these changes would represent an improvement as compared to the Abrahamsen & Smith (2000) research.

Manipulation of Variables

Manipulation of variables refers to a "deliberate operation performed by the experimenter that imposes a set of predetermined experimental condition (the independent variable) on at least one group of subjects" (Portney & Watkins, 2009). In the Abrahamsen research study, the manipulation of variables was considered haphazard. There was no set protocol to follow such as a script that the researcher could follow that would make it more standardized. The study could have been stronger if a specific script was followed by the researcher that would have been read to each participant to allow for equal treatment protocol was adhered to. Otherwise, this skewed the results as it is unclear if some participants were given more instruction than others.

Assignment of Participants

The selection of participants for this research design is critical so that a sample can be considered "representative of the parent population and that it was not biased" (Portney &

Watkins, 2009, page 186). A control group is considered the most effective design strategy in order to eliminate extraneous effects against which the experimental group is compared. In this study, the selection of participants was based on a convenience sample from a special school setting for children with communication difficulties. All participants presented with a communication impairment defined by concomitant diagnoses, Intelligence Quotient (IQ), language test results, and achievement test results. This represented a heterogeneous population making it difficult to apply to children with specific language impairments only. Some of the children have articulation disorders, seizure disorders, attention deficit disorders, and other unrelated disorders; however, this does not ensure a solid representation of a parent population. The researchers did not administer the same language evaluations to all participants to use as a standard measure of assessment. For example, the participants were administered various assessments such as the PPVT-R, TOPS-R, TACL, or the CELF. Therefore, there was no consistency in using the same level of measurement to determine language impairment. In addition, the authors did not indicate any analysis of comparing discrepancies between IQ testing and language testing. Although the Figurative Language subtest of the *Test of Language Competence – Expanded Edition (*Wiig & Secord, 1989) was administered to determine a standard score on the test of idioms, it only served as a baseline. It did not serve a purpose of determining who is language impaired.

More so, there was no control group assigned which would serve as a comparison group for the two different treatments that were implemented. The assignment of the subjects was not conducted randomly according to the research article. There was no indication for balancing which participant would be selected to the computer training condition or the classroom condition.

To improve the selection of participants, several options should be seriously considered for improvement. The participants should be a homogenous group that represents language-impairment only. There should not be any concomitant factors such as ADHD, seizure disorders, or cognitive impairments. A better operational definition of a specific language impairment should be stated such as "significant limitation in language ability, yet the factors that usually accompany language learning problems such as hearing impairment, low non-verbal intelligence test scores, and neurological impairments are not evidenced" (Leonard, 2000). Clearly, this operational definition defies how the Abrahamsen and Smith (2000) research posed a potential threat to its validity. A control group should be identified to determine if the classroom condition (independent variable) or the computer-based condition (independent variable) demonstrates a significant change in the outcome of the treatment model. This is the most effective design strategy for ruling out extraneous effects. Also, participants should be randomly assigned to each control group and be balanced for age, gender, and similar language impairments. If groups are similar at the commencement of an experiment, then there should be greater confidence that differences are not due to inter-subject variability that existed prior to the experiment beginning. Also, in the assignment process, groups are designated as 1, 2, or 3 rather than by treatment. This strategy is useful in continuing the process of random assignment to assign levels of independent variables to groups. When randomization is employed, the validity of the research fulfills the necessary requirement of a true experiment.

Research Protocol

It is essential that protocols be created to be as consistent as possible providing a standardized set of guidelines that would make it reproducible (Portney & Watkins, 2009). In the Abrahamsen and Smith (2000) study, no research protocol was presented. It would be difficult to replicate this

study to achieve a reasonable level of consistency for similar results or outcomes. This study should have used a protocol that presents with positioning of the participants, timing of the treatments and measurements, specific instructions and explanations, and standardized assessments. No specific protocol was used in this study for either condition – computer-based or classroom based. Therefore, it is difficult to control how to replicate this treatment procedure in the future. To improve how a research protocol should have been conducted for this type of study, several suggestions are offered. All participants should have been seated in an area that was conducive to learning free of any extraneous noise or visual distraction in either of the treatment conditions. Specific instructions and scripts should have been read orally to the participants. If this specific methodology were carried through, this would ensure that each participant would receive exactly the same information. Data collection for assessing the dependent variable (idiom) should have been clearly defined. It would have been more useful to use a numerical measurement scale such as 0 = irrelevant response, 2 = literal response, and 2 = figurative response. In fact, those who performed data collection should be trained and tested for reliability and/or inter-rater reliability.

Intention to Treat Analysis

The principle called *Intention to Treat (ITT)* takes into consideration that data are analyzed according to the original random assignment, regardless of the treatment participants actually received or that we analyze data according to the way we intended to treat the subjects. It guards against the possibility of bias if participants drop out of a study, and it affects the outcomes or groups or group assignment and help maintain the original balance of random assignment. It also is useful when some participants may be noncompliant (Portney & Watkins, 2009). Being that the number of participants was small, it was possible that the effect size could have been altered

if participants terminated treatment prior to completing the therapy, refuse the treatment, be noncompliant, or be excluded after randomization due to ineligibility requirements.

Internal and External Threats to Design Validity

The Abrahamsen and Smith (2000) study needs to be closely examined by internal and external validity measures. Internal validity focuses on a cause and effect relationship that applies to this research. It requires three components: temporal precedence, co-variation of cause and effect and other plausible alternative explanations. Temporal precedence attempts to answer the question if the order of treatment and outcome are known. A co-variation of cause and effect documents a relationship between independent and dependent variables showing that the outcome only occurs in the presence of the intervention or to what degree the outcome is related to the magnitude of the treatment. Again, the Abrahamsen and Smith (2000) study was unclear if this was evident as will be described in the threats that will be discussed shortly. Finally, single group threats, multiple group threats, and social threats also present threats to internal validity because there could be other explanations for observed change that are not easily identified or explained. The next section will further explain the threats to internal validity of this study and how it could have been improved for stronger internal validity.

Internal Validity

History refers to the confounding effect of specific events other than the experimental treatment that occurs after the introduction of the independent variable or between a pretest and posttest. In this study, there was an 8-week intervention period. The authors did indicate that classroom training was presented once a week to the entire class for a 20-30 minute session. This was a two-month period of intervention. Perhaps, a shorter period of time may have been more beneficial to determine if the training truly made a significant impact. It is possible that

during that two-month period, participants could have been exposed to the stimuli in other contexts that would be hard to control for. If I had conducted this treatment program, I would have conducted three treatment sessions within a two-week period consisting of 20-30 minutes each.

Maturation is another threat to internal validity as it concerns processes that occur as a function of the passage of time and that are independent of external events. The participants in the Abrahamsen and Smith (2000) study may have had spontaneous language improvement over a two-month period of development that could attribute towards spontaneous improvement. Therefore, the shorter period of intervention that I suggested earlier would demonstrate a stronger argument for treatment in this study.

Attrition or experimental mortality occurs when participants drop out of a study. When a study occurs for a longer period of time, it is likely that attrition could occur. If the study is conducted in a shorter time period as I suggested, it would seem less likely for participants to drop out of a study. Again, this shorter time frame also supports the argument for a shorter intervention period.

Testing effects concern the potential effect of pretesting or repeated testing on the dependent variable. In this study, the participants were administered the Figurative Language subtest in the *Test of Language Competence - Expanded Edition* (Wiig & Secord, 1989). My rationale is that this has been used in many research articles and is considered the "gold standard" for assessment of idiom knowledge. If I were to conduct this research, I would have used the Figurative Language subtest in the *Test of Language Competence – Expanded Edition* (Wiig & Secord,1989) as well as assess idiom knowledge of previously researched idioms originating from Nippold and Rudzinski (1993). They used 24 idioms that were equally distributed in

familiarity (high, moderate, and low) as well as transparency and opaqueness. These idioms have been used in numerous studies with similar results indicating good validity and reliability (Nippold & Duthie, 2003; Nippold & Taylor, 1995; Nippold & Taylor, 2002; Qualls & Harris, 1999); and Qualls, et al., 2003). I would ask the subjects to explain what each of the idioms means and ask them to write the meanings. Then, I would use the same written context that Nippold and Rudzinski (1993) used that contained in the context of a four-sentence paragraph where the idiom occurred at the end of the paragraph. This would serve as a pre-test for the idioms that would be taught in the three-session treatment research program. The response criteria would be operationally defined as Nippold and Rudzinski (1993) defined the answers:

Correct: The response captures the figurative meaning of the expression

Literal: The response reflects the concrete meaning of a word in the expression

Unrelated: The response has nothing to do with the accurate figurative meaning of the expression.

Related: The response is vague or reflects only a partial understanding of the figurative meaning of the expression.

Restatement: The response of the expression or paragraph was repeated or reworded without adding any new information.

No Response: The answer space was left blank or the student expressed a lack of knowledge of the idiom.

Instrumentation effects are concerned with the reliability of measurement. While observers or examinees can become more experienced and skilled at measurements for pretests and posttests, it can create a slight chance that a test taker can learn a few of the idioms by asking others what an idiom means following a test. However, it is critical to administer a standardized examination

such as the *Test of Language Competence – Expanded Edition* (Wiig & Secord, 1989). Normative data is available based on this standardized examination; therefore, it would be a useful assessment tool to use in the evaluation for both pre and post testing conditions.

Multiple Group Threats can pose a threat to internal validity through research design by including a control or comparison group. Since the only difference between the intervention and control group is treatment, it would be more prudent to have a group that is not given any treatment at all. If the groups are not equivalent in all characteristics at the start of the treatment study, then it would be hard to determine if the outcomes are due to treatment or to initial differences. If I were to conduct a study similar to Abrahamsen and Smith (2000), I would have a control group that would not receive any intervention as the primary-language impaired-matched peers. Then, I would feel my results would support stronger validation of the treatment protocol in its delivery to the treatment group versus the control group.

Social Threat refers to the pressures that can occur in research situations that may lead to differences between groups. In the Abrahamsen and Smith (2000) study, there was no mention of how the researchers controlled discussion of the various tasks among the participants. In my study, the participants would be clearly told in written and verbal form that there should not be any verbal interaction or discussion among the subjects of the study.

Blinding Participants and Investigators is another task that could reduce the threat of internal validity. While random assignment cannot rule out the effects of attrition, imitating treatments, or compensatory reactions. Blinding subjects and investigators will control many of these effects. In my research project, I would plan on blinding subjects as well as investigators to rule out any bias as to who is receiving what treatment and what group he or she is in.

Operational Definitions are critical as the label of a method be fully defined and explained so that it could be clearly understood and replicated in future research events. I would label the types of idioms (transparent versus opaque; familiar versus unfamiliar, context versus no context) as well as how the participants were selected to fall into specific categories such as primary language impairment and how it is currently defined versus typical language development.

Hawthorne Effect is the phenomenon known where the tendency of persons who are singled out for special attention to perform better merely because they are being observed. This can be avoided in my research by employing examiners who are blinded to subject assignment and the research hypothesis.

I have discussed internal validity threats to research designs particularly to the Abrahamsen and Smith (2000) research so I will now focus on the external validity threats that need to be considered for this type of research to produce a viable research design.

External Validity refers to the extent to which the results of a study can be generalized beyond the internal specifications of the study sample (Portney and Watkins, 2007). It is often concerned with the usefulness of that information outside the experimental of the research conducted.

Interaction of Treatment and Selection refers to applying results to a target population to individuals who are not experimental participants but who are considered represented by them. Therefore, it is critical to carefully select participants that are similar in age range, gender, specific diagnosis, socio-economic status, or a defined level of function. In my study, I would plan to select typically language developing language developing 8th graders with primary language impaired 8th graders matched by gender and no other concomitant issues. The rationale

for using this age range is that there is an increase in the content core curriculum where students are exposed to more literature and discussions. School-aged children are exposed to figurative language in the classroom, through the media, as well as peer and adult social communication (Nippold, Moran, & Schwarz, 2001). Six percent of sentences in third grade literature contain an idiom that increases to ten percent by sentences by the eighth grade (Nippold, Moran, & Schwartz, 2001). Lazar, Warr-Leeper, Nicholson, and Johnson (1989) reported that 11.5% of classroom teachers' verbal utterances contain idiomatic expressions (Qualls & Harris, 1999). The control group should also not have any history of any communication difficulties or other medical and learning issues. These participants should not have any other issues such as attention deficit disorders, hyperactivity, low intelligence quotient, learning impairments, visual difficulties, and hearing impairments.

Interaction of Treatment and Setting is a question that could be posed by replicating the study in a variety of contexts. For example, my study would be conducted in a school setting that would be a natural setting for children to learn language consisting of 4 days. The first day would consist of pretesting of the control and treatment groups. Days 2 and 3 would consist of treatment for the treatment group. Day 4 would consist of post testing for both the control and treatment groups. The treatment group would be exposed to two modalities of exposure: one in written form and the other in pictorial form. The treatment group would be exposed to five written contexts consisting of four sentences written at a 4^{th} grade reading level as used in the Nippold and Rudzinski (1993) studies. The idiom would be contained in the final sentence. Then, the other five idioms would be presented in pictorial form representing a visual image. It would depict the actual meaning of the expression. For example, if the idiom were "*It is raining cats and dogs",* the figurative picture would represent a 'very heavy rainstorm' rather than a

literal depiction of cats and dogs falling from clouds. The idiom would be written below the visual representation. The hypothesis is that children and adolescents with primary language impairments may benefit from obtaining information via another modality such as visual imagery in a visual (pictorial) form rather than in written language modality. If learning language is a weakness via written and auditory modalities perhaps visual imagery may be a more viable solution in teaching figurative language such as idioms. Finally, if this research model were conducted in a school setting, the threat to external validity would be considered minimal as children learn in this type of structured environment.

Interaction of Treatment and History concerns the ability to generalize results to different periods of time in the past or future. It is quite possible that the idioms that were used in the Nippold and Rudzinski (1993) time period may be considered outdated for my own study which was conducted in 2017. There is a twenty-year period, and the use of figurative language does change over time. This would have to be taken into consideration for the research. To minimize this potential issue, it would be beneficial to pilot the 24 idioms used from the Nippold and Rudzinski (1993) research to determine if these idioms are familiar. If it is known that one idiom is problematic for many of the participants, it could suggest that the idiom could now be considered no longer used as frequently. Therefore, only idioms that are familiar to a piloted group would be used for this research study.

Informed Consent to Participate is the "most important ethical tenet in human studies in that the individual's ability to agree to participate with full understanding of what will happen to him or her" (Portney & Watkins, 2009). It was not stated in the Abrahamsen and Smith (2000) study; however, my participants would be fully informed of the study with an invitation to participate. The information would be provided in layperson's language describing the purpose of the study

and to allow the participant to decide whether he or she believes in the importance of the study. Consent elements include the following according to Portney and Watkins (2009): (a) Consent must be voluntary; (b) special consideration must be given to participants who are particularly "vulnerable"; (c) Participants must be free to withdraw consent at any time; and (d) informed consent and usual care. The Seton Hall Institutional Review Board would review the detailed research proposal prior to any research commencing. Once approved, I would need to obtain permission from pre-selected school boards and then obtain permission from participants' parents and/or guardians as they are considered minors. It is essential to obtain approval of the designated review committee prior to conducting research on human participants.

The CONSORT Statement

The Consolidated Standards for Reporting Trials or the CONSORT statement are guidelines for reporting have been developed by an international community of researchers and statisticians (Portney & Watkins, 2009). It is a checklist of 22 items that pertain to the reporting random control trials. For example, it identifies paper sections and topic with descriptions such as "Sample Size: How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules" (page 186, Portney & Watkins, 2009). When this CONSORT statement is applied to the Abrahamsen and Smith (2000) research study, it helps readers determine how the study was conducted and analyzed. Although this study was conducted in 2000, this CONSORT statement could have helped guide the researchers and enable readers to better plan the research study and then assess the validity of results. However, this statement was created and published in 2007. This model would be an excellent tool to use to replicate the Abrahamsen and Smith (2000) study with modifications taking into account the methods, results, and discussion with a better design as described above. In my own study, I plan

to use the CONSORT statement in my own randomized control trial so that I could minimize eliminating critical details in my research study.

In summary, the methods, results, and discussion of the Abrahamsen and Smith (2000) study were critically reviewed using the Portney and Watkins (2007) model for creating a sound experimental design. As described above, there was a great lack of evidence in how participants were recruited and selected particularly for homogeneity. The treatment protocol was not provided in the research paper that makes it difficult for replication as well as for reliability measures. Internal and external validity threats were clearly defined and compared to the Abrahamsen and Smith (2000) study as well as to how I would conduct my own research project. Finally, the CONSORT statement (2007) suggests an excellent checklist for applying my own research project for adolescents learning idioms using two separate modalities (pictorial and linguistic). The application of the CONSORT statement will make a significant improvement over the Abrahamsen and Smith (2000) study as it takes into consideration the planning stages of the research process and the assessment of the validity of the results.

Summary

Idioms are expressions that have figurative interpretations other than their literal meaning. Children are exposed to idioms early in their school age years in written and verbal forms. Idioms can be more or less interpretable by transparency. The more transparent or semantically analyzable an idiom is, the easier it is to interpret. Idioms can vary in terms of how frequently a subject may be exposed to them. The more frequently the idiom is used, the easier it is for a child to interpret it. Regardless of familiarity, the context surrounding an idiom can be critical for idiom interpretation. We currently have no data as to when children begin producing idioms, yet

we know that idiom interpretation continues well into adulthood. Further investigation into effective teaching strategies for school-aged students develop a greater interpretation of idioms is critical. Given how prevalent idioms are in academic texts and classrooms, it would behoove us to further explore more effective methods of teaching idioms.

CHAPTER THREE

METHODS

Participants

Three participants, all boys, were enrolled in his intervention study. Pilot 1 was 12 years and 8 months old. He was monolingual and of Caucasian race/ethnicity. Participant 1 was 13 years and 8 months old. He was monolingual and of Caucasian race/ethnicity. Participant 2 was 11 years and 9 months old. He was monolingual and of Caucasian race/ethnicity. (Table 4). All three participants lived in northern New Jersey and attended public schools were placed in general education classrooms for chronological age. They did not have cognitive, neurological, sensory, motor, or social-emotional diagnoses by parent report. There were no reports of blindness, hearing, developmental, neurological or medical disorders, behavioral-emotional impairments other than language impairments. Parents signed consent form, and the students signed assent form. All participants were seen in public school language therapy consisting of 40 minute sessions per week. The speech-language pathologist did not include idiom training in the sessions with these participants.

Table 4. *Participants.*

Participant	Age	Gender	Race	Enrolled in Language Therapy
Pilot	12;8	M	C	Yes
Participant 1	13;8	M	C	Yes
Participant 2	11;9	M	C	Yes

Inclusion and Exclusion Criteria

Inclusion criteria were an age-range of 11 years 0 months old through 13 years 11 months of age at recruitment and attend either a public or private school. They needed to be monolingual English-speaking. They were recruited from the northern New Jersey region. Their language impairment was documented by all of the following inclusion criteria:

(a) Reported to be receiving language therapy at school or from a private, licensed speech-language pathologist OR performed greater than one standard deviation below the mean of the *Clinical Evaluation of Language Fundamentals (CELF) V Recalling* subtest, *CELF* V *Metalinguistics, Figurative Language* subtest, or *Expressive One Word Vocabulary Test*; and

(b) Had no other cognitive, neurological, sensory, motor, or social-emotional diagnoses by parent report; and

(c) Must be educated in a general education classroom for chronological age to ensure no intellectual disability was present.

The exclusion criteria included the following:

(a) Diagnosed with sensory impairments such as blindness, hearing, other developmental, neurological or medical disorders, behavioral-emotional impairments such as autism or cognitive impairments other than language impairment by parent report; or

(b) Performed within or above the range of average of subtest of the *CELF V (Recalling Sentences), CELF V Metalinguistics (Figurative Language), EOVT*; or

(c) Did not meet other inclusion criteria.

All three boys met inclusion criterion.

Procedures

Thirty-two flyers and letters (Appendix C & D) were sent to private speech-language pathologists (SLPs) listed on the New Jersey Speech-Language-Audiology Association (NJSHA) newsletter which is published quarterly. They were sent to practices in the northern New Jersey region who work with families through private SLPs for this study. The advertisements were geared to families of students between the ages of 11-13 years of age with specific language impairment. The SLPs were asked to post the handouts to families in their private practices. Parents contacted the examiner by telephone. The study was approved by the Institutional Review Board at Seton Hall University (Appendix B). A Parent Consent form (Appendix E) was signed by either one or two parents as the examiner reviewed the procedures the participant would undergo. The Parent Consent form granted permission for the researcher to approach the child to participate in the study. Once signed, the child was then asked to provide his own assent after the examiner read the Assent form (Appendix F) to the child. Parent consent and the child's participation were voluntary, and refusal to participate would not result in any penalties. The child was informed that he could withdraw from the study at any time without penalty. The child's name and information collected in this study were kept anonymous. An alpha-numeric code was used on all research administered materials rather than the child's name. All data that was obtained from this study, including Informed Consent and Assent forms, standardized tests results, videos, and responses, were locked in a password protected room in at Seton Hall University. Only the researcher was able to link the child's name to his records. For the child's participation, each received a $25 Amazon gift card purchased by the examiner. Parents were

allowed to share results of the standardized assessments administered with the child's teacher or Child Study team following completion of the research protocol if they chose to do so.

Design

This was a single subject alternating treatments experimental design (SSED) that draws conclusions about the effects of treatment based on the responses of a single participant under controlled conditions (Portney & Watkins, page 236). Single subject experimental designs or SSEDs have been historically used in communication sciences and disorders (Byiers, Reichle, & Symons, 2012). It is "the study of a single subject over a period of time (or phases) to determine whether or not a given treatment (intervention) is effective in changing one's behavior or score" (Satake, Jagaroo, & Maxwell, page 1). It helps identify the "best educational and clinical practices in psychology, education, speech-language science, and other related rehabilitation disciplines" (Byiers, Reichle, & Symons, 2012). Researchers who examine single case studies often rely on visual analysis of data to determine the functional relationship between the independent variable (IV) –treatment and existence of an outcome variable or dependent variable (DV), as well as the strength of that relationship (Kratochwill et al., 2013).

"Single-subject-controlled experimental research methods were advanced several decades ago as an alternative to group experimental research in basic experimental psychology and later for the effectiveness of treatment in communication disorders and other variety of disorders" (Thompson, 2015). There are explicit requirements for demonstrating both internal and external validity which are essential to rule out placebo effects, Hawthorne effects, and other influences of extraneous variables. Single subject refers to the fact that instead of a control group in a group design, the single subject experimental design uses the single subject as the control and multiple baselines and alternating treatments and untreated stimuli are used to preserve internal validity.

Three critical factors support the use of visual analysis in the use of single subject design data. First, much of published literature applies visual analysis to data outcomes and interpretations. Second, there are no agreed upon criteria for using statistical analysis of single-case data alone. Third, there has been considerable debate over how to calculate effect size (ES) for single case data (Kratochowill et al., 2013). Fourth, effect size does not indicate what relationship created the effect. However, Kratochowill et al., 2013 still suggested using either of two approaches to measure effect size: PEM (points exceeding the median of baseline) or PND (percentage of non-overlapping data). Both are non-parametric measures. PEM was used for this study to avoid the shortcomings of the PEM approach such as running the risk of making a Type II error or accepting the false null hypothesis (Ma, 2006). Data points have a 50% change of being above or below the median in the baseline phase at the median level in the baseline phase. The PEM score has a range of 0 to 1. To calculate PEM, a middle data point is determined in the baseline phase. Then, all data points above the middle line for this study were calculated. Calculation is based on scoring the percentage of data points above the median line. Ninety percent or higher are considered to be highly effective; 70-89% is considered to be moderately effective; and 0-69% is considered questionable or ineffective treatment.

This study used an alternating treatment SSED design. It involves two or more interventions with a baseline (A) phase and then a treatment (B) phase. Two treatment conditions were implemented: Stories with Pictures and Stories Only conditions. Each child served as his own control. The purpose of this type of design was to explore the impact of each child's individual performance for the two intervention methods used.

Stimuli

The meanings of the idioms used for the treatment phase were selected by using synonymous meanings of the idioms provided on the test examples (Appendix H) The pictures used to depict the meaning of the idiom were used by Google Images. The examiner typed in the meaning of the idiom and various pictures appeared on the screen. The examiner selected two pictures, and then both the examiner and another certified SLP agreed on the better picture representation for each idiom used in this study. There was 100% agreement between two ASHA certified speech-language pathologists including this researcher for all twenty pictures used in this study.

Idioms that were counterbalanced in this study were distributed as seen in Table 5. Pilot 1 was probed on all 20 idioms but 10 were eliminated since he knew these idioms well. Following a post ad hoc analysis, he was treated with 4 Stories with Pictures Only and 6 with Stories Only condition.

Table 5. *Idioms in Stories with* Pictures Conditions and Stories Only Conditions for Pilot 1, Participant 1 and Participant 2

	Stories with Pictures	Stories Only
Pilot 1	XXXXXXXXXXXX	XXXXXXXXXX
Participant 1	Skating on thin ice	
Participant 2	Skating on thin ice	
Pilot 1		Thrown to the wolves
Participant 1	Thrown to the wolves	
Participant 2	Thrown to the wolves	
Pilot 1		Go into one's shell
Participant 1	Go into one's shell	
Participant 2	Go into one's shell	
Pilot 1	XXXXXXXXXXXXXX	XXXXXXXXXX
Participant 1		Blow off some steam
Participant 2		Blow off some steam
Pilot 1	Keep up one's end	

Participant 1	Keep up one's end	
Participant 2	Keep up one's end	
Pilot 1	XXXXXXXXXXXXXX	XXXXXXXXXXXXX
Participant 1	Cross swords with someone	
Participant 2		Cross swords with someone
Pilot 1	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX
Participant 1		Breathe down one's neck
Participant 2	Breathe down one's neck	
Pilot 1		Strike the right note
Participant 1	Strike the right note	
Participant 2		Strike the right note
Pilot 1	Paper over the cracks	
Participant 1	Paper over the cracks	
Participant 2		Paper over the cracks
Pilot 1	XXXXXXXXXXXXXXXX	
Participant 1	Go around in circles	
Participant 2		Go around in circles
Pilot 1	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX
Participant 1	Put their heads together	
Participant 2	Put their heads together	
Pilot 1		Put one's foot down
Participant 1	Put one's foot down	
Participant 2	Put one's foot down	
Pilot 1	Read between the lines	
Participant 1		Read between the lines
Participant 2	Read between the lines	
Pilot 1	Rise to the bait	
Participant 1		Rise to the bait
Participant 2		Rise to the bait
Pilot 1	Beat around the bush	
Participant 1	Beat around the bush	
Participant 2		Beat around the bush
Pilot 1	XXXXXXXXXXXXX	XXXXXXXXXXX
Participant 1		Make one's hair curl
Participant 2		Make one's hair curl
Pilot 1	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX

Participant 1	Go against the grain	
Participant 2	Go against the grain	
Pilot 1	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX
Participant 1		Take down a peg
Participant 2		Take down a peg
Pilot 1	Talk through one's hat	
Participant 1		Talk through one's hat
Participant 2		Talk through one's hat
Pilot 1	XXXXXXXXXXXXX	XXXXXXXXXXXXXX
Participant 1		Leading with your chin
Participant 2	Leading with your chin	

XXXX represents idioms not used in treatment for Pilot 1

Equipment

All procedures were videotaped for data coding and analysis and reliability coding. The videotape recorder used was a Sony Camcorder HDR-CX405. All evaluation and treatment sessions were conducted in the child's home.

Independent and Dependent Variables

The independent variables in this design were the two treatment conditions (1) Verbal/Written Explanation Treatment and (2) Visual Treatment. The dependent variables in this study were (1) percentage of idioms' definitions accurately (Verbal Explanation of Idioms probes); (2) percentage of idioms' definitions that are identified accurately (Comprehension of Idioms probes); and (3) percentage of idioms that are identified in a novel context accurately (Generalization probe).

Measures

A pre-screening was administered to the participant to determine if he qualified for the study. Three standardized language tests were administered:

- *Clinical Evaluation Language Fundamentals 5th Edition, Sentence Recall subtest* (Wiig, Semel, & Secord, 2013)
- *Clinical Evaluation of Language Fundamentals, 5th Edition, Metalinguistics subtest* (Wiig & Semel, 2014)
- *Expressive One-Word Vocabulary Test* (Martin & Brownell, 2011)

The CELF 5th Edition Metalinguistics subtest (Wiig & Semel, 2014) was administered pre-and post-treatment. This subtest specifically tested idioms in a standardized test. The Figurative language test is used to evaluate the ability to interpret idioms within a given context and match

each expression with another figurative expression of similar meaning. The examiner presents a situation (e.g., a girl talking to a friend about a flat tire) and an expression that one of the characters might use within the context (e.g. I have to change the tire, so would you give me a hand?). Both the situation and the expression are presented verbally and visually (in text). The student is asked to describe what the expression means. Next, the examiner verbally and visually presents four other figurative expressions and asks the student to select the one with the meaning that is closest to the first expression. This subtest is similar to the Verbal Explanation probes; however, the idioms used were different than the ones used in training. The researcher also requested medical and speech-language evaluation and progress reports from the parent or guardian to determine if the child was eligible for the study.

Expressive, Receptive and Generalization Probes

The child was pretested on twenty idioms selected from the Nippold & Rudzinski (1993) study. These idioms have been used for several research studies (Nippold, 2007; Nippold & Duthie, 2003; Nippold & Martin, 1989; Nippold, Moran, & Schwartz, 2001; Nippold & Rudzinski, 1983; Nippold & Taylor, 1995; and Nippold & Taylor, 2002). Each idiom was embedded in a four-sentence story with four multiple choice questions. The responses were similar so that the student could not easily determine the response as the idiom was contained in the story, and it would be easier for the student to rule out opposite meanings, literal meanings and unrelated meanings. Nippold & Taylor (1995) ranked the idioms in order of complexity based upon the results of the study (Appendix G).

There were three probes (Verbal Explanation Idiom Probe, Comprehension Idiom Probe, and Generalization Idiom Probe). All test stimuli were read orally to the participant while they read along on the written stimuli index cards. The rationale for initially testing the Verbal Explanation

Idioms was to avoid providing the participant with possible answers that are listed in the Comprehension Idiom probes.

First, the participant was presented with Verbal Explanation Idiom Probes. The Verbal Explanation Idiom Probes contained open-ended questions requesting the participant to explain what the idioms meant in an open-ended format (Example: "What does *have a soft heart mean?"*) (Appendix I). The participant provided a verbal explanation as the examiner recorded the response on a form. Synonymous meanings for idiom interpretation can be seen in Appendix I. The examiner stated, "This is a project on idioms. Idioms are expressions that have special meanings, such as *hold your tongue* and *pull your leg.* I would like your help with the project by answering some questions about some idioms. This work should take about 15 minutes. Thanks for your help." The first card read, "Each question asks what the meaning of the idiom is. Please answer the question to the best of your ability. Let's get started with some examples." The following card read, "What does it mean to *get off the hook?"* Once the participant responded with a verbal interpretation, the examiner moved on to the actual idioms used for the study. If the participant was unclear as to what was expected, the examiner would provide verbal support as to what was expected of the participant to do. Once all twenty Verbal Explanation Idiom probes were presented, the examiner moved to the Comprehension Idiom Probes.

The Comprehension Idiom Probe (Appendix J) was presented in a verbal and written format. No stories were read in the Comprehension Idiom Probe. There were four possible choices. For the purposes of scoring, the responses were marked either as correct (+) or incorrect (-) for Verbal Explanation, Comprehension, and Generalization tasks. The examiner stated, "Each question asks a question about the meaning of an idiom. There are four answer choices. Read each answer choice carefully. Then, choose the best one for each question. Choose the answer

that you think best explains the meaning of the idiom. Point to and say the letter of the best choice. Let's try some for practice." The first practice problem read, "What does it mean to *get off the hook?*"

a. To do many different things

b. to think carefully about a problem

c. to help other people when needed

d. to get out of a situation

Once the participant successfully completed the practice problems, the test (n=20) idioms were presented to the participant on each card following the instructions, "Now, I would like you to answer the rest of the questions by yourself. Please do your best work. If you aren't sure of an answer, just take a guess. Point to the correct answer that you <u>think</u> is best. Do you have any questions?" None of the participants had any questions.

The Comprehension and Verbal Explanation Probes served as the baseline for idiom understanding. Responses for Verbal Explanation and Comprehension Probes were marked as *correct* (+) or *incorrect* (-). The stimuli were presented on 5 x 7-inch laminated index cards.

The <u>Generalization Probe</u> was also administered once during baseline data collection and at post-treatment. The examiner stated to the participant, "You will listen to and read stories and determine which idiom best fits the situation. Please point to and say the idiom that you feel best describes the situation". Then, the examiner presented a four-sentence contextual story and four possible idioms to select in *a, b, c, d* format (Appendix K). For example, the examiner read, "Patrick was throwing a baseball to his friend near his driveway. Patrick accidentally threw the ball in the wrong direction, and it hit the car window. The car window was broken. His friend said, "_____"

a. *Rise to the bait*

b. *You are in hot water*

c. *Blow off some steam*

d. *Talk through one's hat*

The participant stated which of the idioms fit the story best with a verbal response.

Treatment Procedure:

Once a baseline had been established, treatment was introduced. The stimuli were the same twenty idioms used from the probes presented. Based upon the baseline performance of each participant, the idioms were selected counterbalanced for idioms known and unknown for each participant. However, ten idioms were presented in the oral/written format and ten idioms were presented in the oral/written/picture format. Depending upon how which idioms the participants knew during the baseline sessions, idioms were equally divided by what each participant answered correctly or incorrectly.

The meanings of the idioms were presented in the oral/written and oral/pictorial formats (Appendix L and Appendix M). In each training session, the idioms were counterbalanced for the schedule of idioms presented verbal/written and oral pictorial formats so that the order changed from session to session.

There were practice trials so that the participants understood for understanding of the task. Each child underwent two sessions per week consisting of up to 30 minutes each with a maximum number of six weeks of treatment depending upon the child's schedule or until the participant achieved 80% accuracy for two consecutive sessions for the Idiom Comprehension Probe.

When the treatment phase commenced, the examiner said, "I will be reading stories to you. An idiom will be used in each story. An idiom is an expression that has a special meaning. Listen carefully to each story so that you can learn what the idiom means. Let's try some for practice". The participant listened to the examiner and read the story along with the examiner as each idiom stimulus was presented. When the visual format for the idiom was presented, the examiner picked up the card and showed the picture on the other side of the index card that showed the picture of the meaning as the meaning was also read. In each treatment session, the stimuli were counterbalanced so that the idioms were not presented in the same order.

Once the participant achieved 80% accuracy or better in the Comprehension Idiom probe (i.e., the participant identified 80% of the meaning of the idioms correctly for two consecutive sessions) or if the participant did not achieve 80% accuracy after 12 sessions, treatment was discontinued.

Once the treatment discontinued, the participant was re-assessed using the *CELF, 5th Edition, Metalinguistics subtest* (Wiig & Semel, 2014) and the Generalization probe. Table 6 shows the procedure format over time.

Table 6. Procedure format over time.

Days 1, 2, 3 Baseline	Day 4	Days 5-12	Post Treatment
Formal Assessments to define the	Verbal Explanation Probe and Comprehension	Verbal Explanation Probe and	CELF V Metalinguistics Subtest; Generalization Probe

Participant's language and Initial Performance on Treatment Stimuli	Probe	Comprehension Probe
Verbal Explanation, Comprehension, and Generalization Probes	Treatment of 20 idioms (10 oral/written, 10 oral/pictorial) Randomly assigned based on BL performance and counterbalanced	Treatment of 20 idioms (10 oral/written,

Reliability and Treatment Fidelity

There was 80% inter-rater reliability for responses for Verbal Explanation, Comprehension, and Generalization probes and 100% inter-rater reliability for treatment fidelity. Treatment sessions were coded by an independent coder from video-recordings for treatment fidelity. The experimenter applied the treatment protocol with 100% accuracy (pairing pictures in the visual condition, reading stories in both conditions).

CHAPTER FOUR

RESULTS & DISCUSSION

Pilot Study

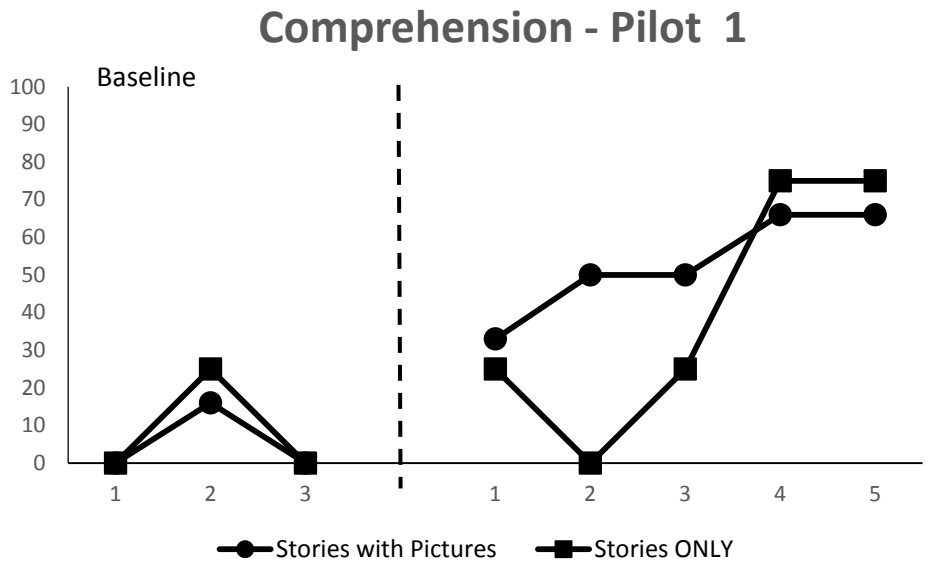
Pilot 1 was a 12;8 year male and was a 7th grade student. He was seen for language remediation in the public school setting once weekly for 40 minutes. According to his Individual Education Plan (IEP) and speech-language pathologist, he was diagnosed with a specific language impairment. Initial standardized test results are seen in Table 7:

Table 7. Pilot 1 Standardized test results.

Test	Standard Score/Scaled Score	Percentile Rank	Raw Score
Expressive One Word Vocabulary Test	Standard Score: 93	32	116
CELF-V Metalinguistics subtest	Scaled Score: 7	16	24
CELF-V Sentence Recall	Scaled Score: 4	2	31

In this pilot study, Pilot 1 understood ten of the 20 idioms during the baseline phase. Therefore, the data were reviewed and ten idioms were discarded for the treatment phase. Six of the idioms were in the Stories with Pictures only condition and four of the idioms were in the Stories Only condition. Pilot 1 achieved 80% comprehension of the idioms he learned following five treatment sessions.

Figure 1. Pilot 1 Comprehension of idioms.



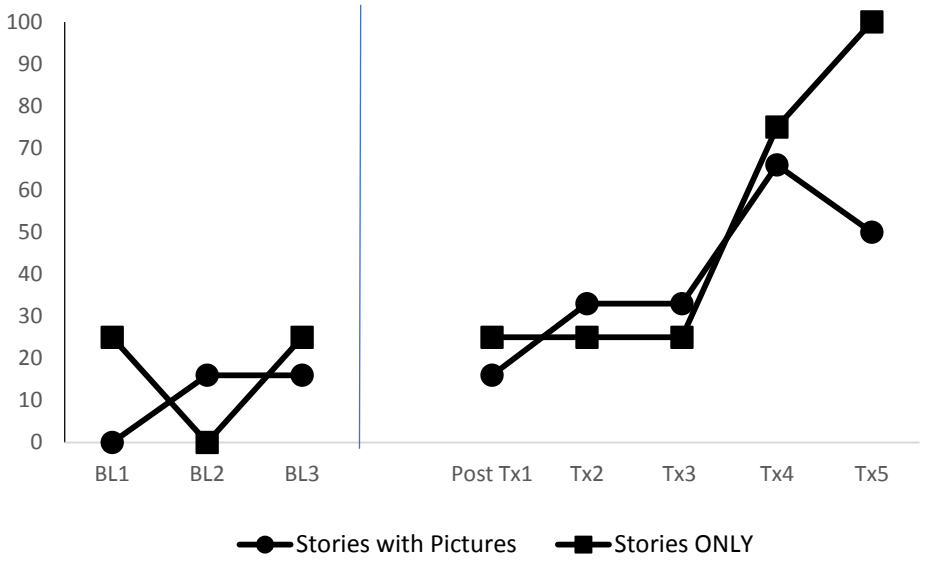
Three baseline data sessions were conducted, and treatment commenced following the third baseline data session. He was probed on 20 idioms. Idioms that the Pilot knew in baseline for 2 of 3 probes were omitted from the treatment as it was felt that it might skew the results since he knew the idioms previously. Of the ten idioms he did not know, those idioms were then analyzed based on idiom learning. Six were presented in the stories with picture condition, and four were presented in the story only condition. The purpose of teaching idioms to the pilot was to determine which condition was better for learning idioms for those idioms he did not know. He was probed for Comprehension of Idioms, Verbal Explanation of idioms and Generalization of Idioms. The Pilot underwent three baseline sessions, and then he had five treatment sessions.

In Figure 1, the Pilot understood the idioms given a multiple choice of four items for a mean of 5% in the stories with pictures condition and a mean of 8.3% for the story only condition. The baseline shows a level trend demonstrating that there was no evidence of learning these idioms prior to training. P1 began training following the third baseline and was probed for both conditions prior to each training session. The Pilot had an effect size of 40% for the Stories with Pictures condition using the PEM measurement which was considered ineffective treatment and 100% accurate for Stories only condition which was considered highly effective treatment. It is important to remember that the Pilot received treatment for Stories with Pictures only condition which was six idioms and Stories Only condition which contained four idioms. Therefore, effect size may be overinflated.

Visual Analysis of Comprehension of Idioms graph show that the level for baseline was stable, and for both treatment conditions demonstrate level changes were observed. The trend in both conditions demonstrate level trend for baseline for both conditions but positive slopes for

Stories with Pictures and Stories Only conditions. The variability in baseline demonstrated minimal variability in both conditions and increased variability in Stories with Pictures and Stories Only conditions. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

Figure 2. Pilot 1 Verbal explanation of idiom

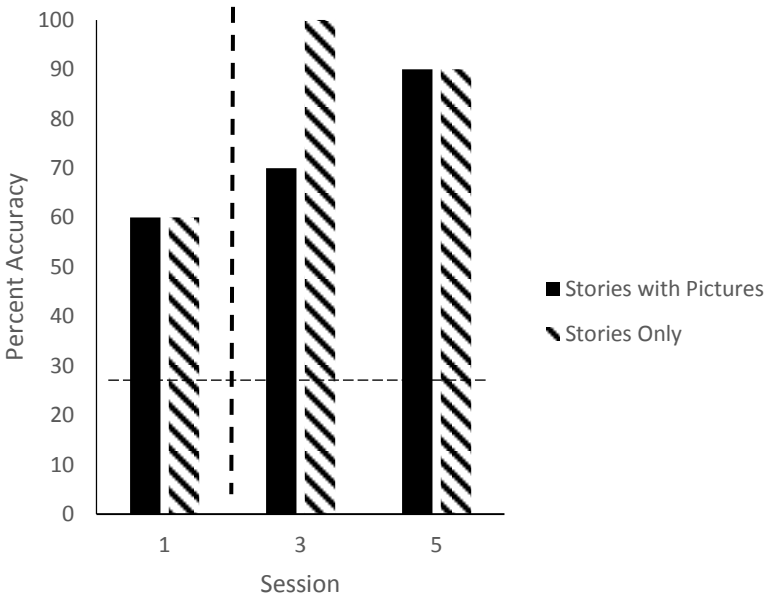


In Figure 2, Verbal Explanation of Idioms, the Pilot was asked to explain each idiom. In the baseline, he presented a mean of 5% in the Stories with Pictures condition and a mean of 8.3% for the Story only condition. The baseline shows a level trend demonstrating that there was no evidence of learning these idioms prior to training. The Pilot had an effect size of 80% for the Stories Only condition demonstrating moderately effective treatment and Stories Only was 100% effective demonstrating highly effective treatment unreliable treatment using the PEM

measurement. Again, the Pilot received treatment for Stories with Pictures only condition which was six idioms and Stories Only condition which contained four idioms.

The visual analysis of Verbal Explanation of Idioms graph shows that the level for baseline was stable, and both treatment conditions demonstrate level change. The trend in both conditions demonstrate level trend for baseline for both conditions but positive slopes for Stories with Pictures and Stories Only conditions. The variability in baseline demonstrated minimal variability in both conditions and increased variability in Stories with Pictures and Stories Only conditions. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

Figure 3. Pilot 1 Generalizations of idioms



In Figure 3, Generalization of Idioms, the Pilot was asked to identify the correct idiom after listening and reading along with a story. In the baseline, he scored 75% in the Stories with Pictures condition and 50% for the Story only condition which was only one data point for each condition. He did score a mean of 75% for the Stories with Pictures condition mean of 87.5% for the Stories Only condition during the treatment phase. The Pilot had an effect size of 100% for the Stories Only condition demonstrating highly effective treatment and Stories Only was 100% suggesting highly effective treatment using the PEM measurement. Again, the Pilot received treatment for Stories with Pictures only condition which was six idioms and Stories Only condition which contained four idioms.

In Figure 3, Pilot 1 Generalization of Idioms, the visual analysis only has one data point in baseline and two data points in treatment. The level for baseline from baseline into treatment demonstrates level change for both treatment conditions. The trend in the Stories with Pictures condition demonstrates level trend but there is a positive slope for Stories Only condition. Stories. The variability from baseline to treatment demonstrated some variability in Stories with Pictures but Stories Only condition demonstrated significant variability. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

Figure 4. Pilot 1 Mean Scores of Comprehension, Verbal Explanation, and Generalization Probes.

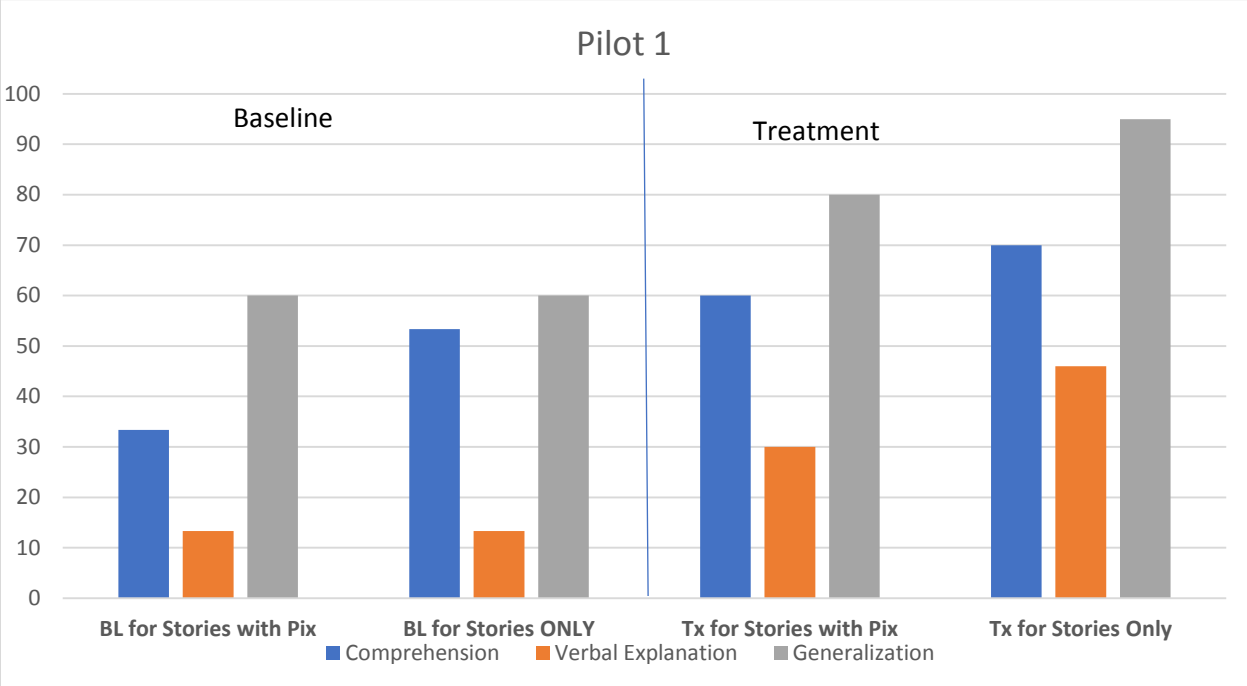


Table 8. *Pilot 1 Pre-Post standardized test results of CELF V Metalinguistics (Figurative Language).*

	Scaled Score	Percentile Rank	Raw Score
Pre-Test	7	16	24
Post-Test	8	25	31

Item Analysis:

The results of the pre-and post-testing shown in Table 8 revealed that Pilot 1 increased his raw score from 24 correct items to 31 correct items following five treatment sessions. In pre-testing, Pilot 1 was able to explain 3 of 10 (30%) transparent idioms and 5 of 7 (71%) opaque idioms in

the Open-Ended Figurative Language Item Analysis. However, in post-testing, he was able to explain 6 of 10 (60%) transparent idioms and 6 of 7 (85%) opaque idioms.

Table 9. *Pilot 1 item analysis of open ended questions.*

Types of Idioms	Pre-Treatment	Post-Treatment
Transparent	30%	60%
Opaque	71%	85%

In the Multiple Choice Figurative Language Error Analysis (Table 10), Pilot 1 provided 3 opposite meanings for idioms in the pretest but only 1 opposite meaning in post testing; 2 literal meanings in pretest and 3 literal meanings in post-test; and 3 unrelated figurative expressions in pretest and 4 unrelated errors in post-test.

Table 10. *Pilot 1 item analysis of multiple choice responses.*

Error Category	Pre-Treatment	Post-Treatment
Opposite Expression	3	1
Literal Expression	2	3
Unrelated Expression	3	4

Research Question Responses for Pilot 1

- RQ1a. Pilot benefitted from written stimuli for comprehension of idioms but took longer.
- RQ2a. Pilot benefitted from picture stimuli for comprehension of idioms

- RQ1b. Pilot benefitted from written stimuli for verbal explanation of idioms.
- RQ2b. Pilot benefitted from picture stimuli for verbal explanation.
- RQ1c. Pilot did not directly benefit from written stimuli for generalization of idioms
- RQ2c. Pilot benefitted from picture stimuli for generalization of idioms

Participant 1 and Participant 2

Participant 1 (P1) was a 13;8-year male and was a 7th grade student. He was seen for language remediation in the public school setting twice weekly for 40 minutes. According to his Individual Education Plan (IEP) and speech-language pathologist, he was diagnosed with a specific language impairment. Initial standardized test results are as follows:

Table 11. *Participant 1 Standardized test results.*

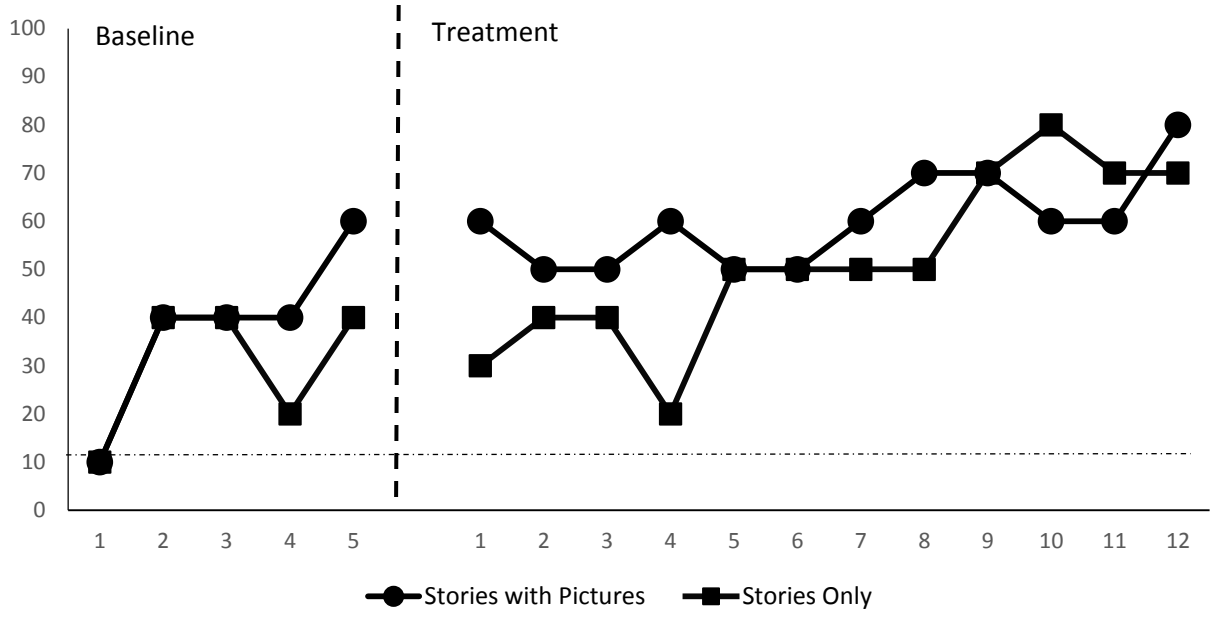
Test	Standard Score/Scaled Score	Percentile Rank	Raw Score
Expressive One Word Vocabulary Test	Standard Score: 92	30	119
CELF-V Metalinguistics subtest	Scaled Score: 7	16	26
CELF-V Sentence Recall	Scaled Score: 6	9	42

Participant 2 (P2) was an 11;9-year male and was a 6th grade student. He was seen for language remediation in the public school setting once weekly for 40 minutes. He was diagnosed with a specific language impairment according to his Individual Education Plan (IEP) and speech-language pathologist. Initial standardized test results are as follows:

Table 12. *Participant 2 Standardized test results.*

Test	Standard Score/Scaled Score	Percentile Rank	Raw Score
Expressive One Word Vocabulary Test	Standard Score: 109	73	128
CELF-V Metalinguistics subtest	Scaled Score: 7	16	31
CELF-V Sentence Recall	Scaled Score: 6	9	39

Figure 5. Participant 1 Comprehension of Idioms.

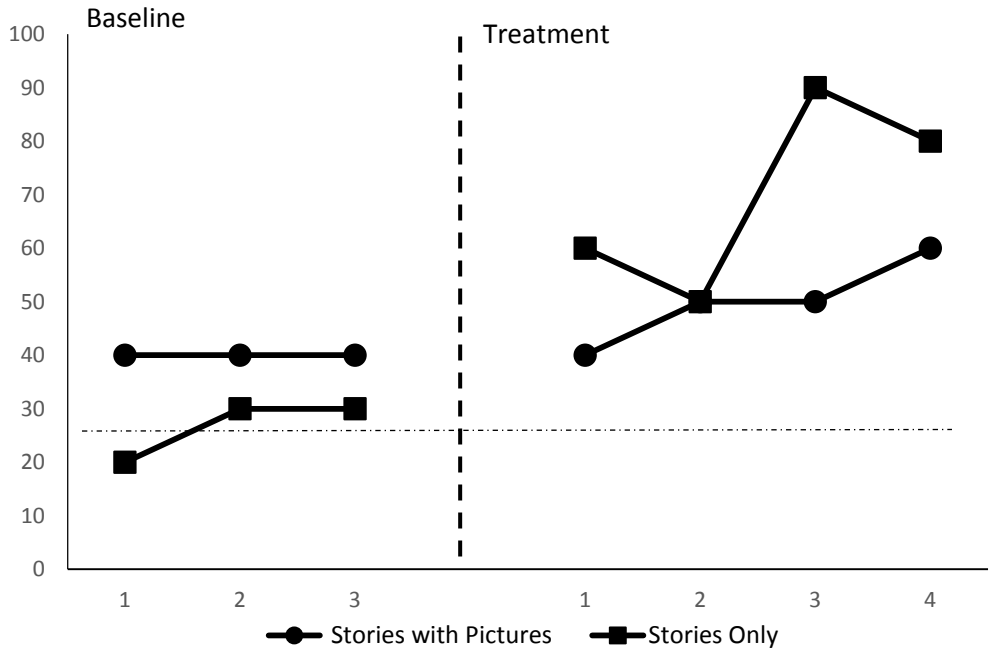


Participant 1 was probed for five baseline sessions. Treatment commenced following the 5th baseline data session. He was probed on 20 idioms in each area: Comprehension of Idioms, Verbal Explanation of Idioms, and Generalization of Idioms. Participant 1 never achieved 80% comprehension of the idioms he learned following five treatment sessions.

In Figure 5, Comprehension of Idioms, P1 scored a mean of 38% in the Stories with Pictures condition and a mean of 30% for the Story only condition in the baseline conditions. The baseline shows a level trend demonstrating that there was no evidence of learning these idioms prior to training. P1 had an effect size of 100% for highly reliable treatment and 60% accuracy for Stories only condition which was considered questionable effectiveness using PEM scoring.

The visual analysis of comprehension of idioms graph show that the level for baseline level change for both condition and level change for treatment conditions. The trend in both conditions demonstrate accelerating trends for baseline and accelerating trends for treatment in Stories with Pictures and Stories Only conditions. The variability in baseline demonstrated increased variability in both conditions and some variability in Stories with Pictures and Stories Only conditions for treatment.

Figure 6. Participant 2 Comprehension of Idioms.

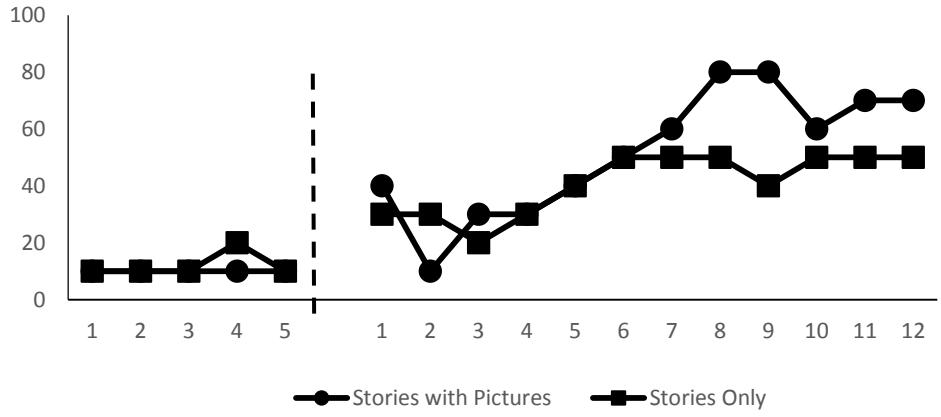


In Figure 6, P2 understood the idioms given a multiple choice of four items for a mean of 40% in the Stories with Pictures condition and a mean of 26.66% for the Story Only condition in baseline. P2 required four treatment sessions to interpret idioms taught. Following baseline, there

was a mean score of 50% for Stories with Pictures and a mean of 70% for Stories Only condition. In treatment, there was a mean of 50% for Stories with Pictures condition and 70% for Stories Only condition. The PEM results were 70% for Stories with Pictures indicating questionable effective treatment and 100% or Stories Only condition indicating highly effective treatment.

Visual Analysis of Comprehension of Idioms graph show that the level for baseline was stable for both treatment conditions and level change was observed. The trend in both conditions demonstrate zero slope for baseline for both conditions but positive slopes for Stories with Pictures and Stories Only conditions. The variability in baseline demonstrated minimal variability in both conditions and increased variability in Stories with Pictures and Stories Only conditions.

Figure 7. Participant 1 Verbal explanation of idioms.

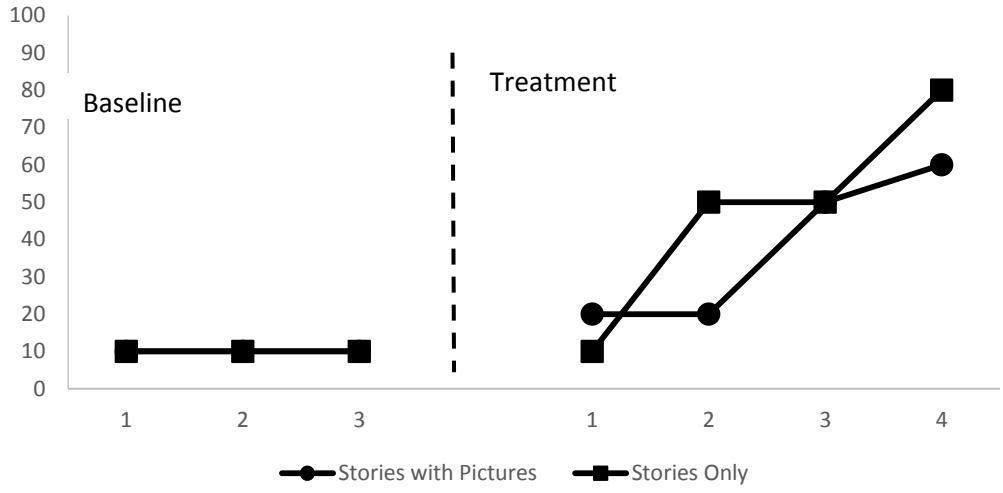


In Figure 7, Verbal Explanation of Idioms, Participant 1 (P1) was asked to explain each idiom. In the baseline, he presented a mean of 10% in the Stories with Pictures condition and a

mean of 12% for the Story Only condition. In the treatment phase, P1 scored a mean of 52% in the Stories with Pictures condition and a 40% mean for Stories only condition. P1 had an effect size of 90% for the Stories with Pictures condition demonstrating highly effective treatment and 100% for Stories Only condition demonstrating treatment using the PEM measurement.

The visual analysis of Verbal Explanation of Idioms graph shows that the *level* for baseline was stable, and both treatment conditions demonstrate level change. The trend in both conditions demonstrate level trend for baseline for both conditions but positive slopes for Stories with Pictures and Stories Only conditions. The variability in baseline demonstrated minimal variability in both conditions and increased variability in Stories with Pictures and Stories Only conditions.

Figure 8. *Participant 2 verbal explanation response scores.*



In Figure 8, Verbal Explanation of Idioms, Participant 2 (P2) was asked to explain each idiom. In the baseline, he presented a mean of 10% in the Stories with Pictures condition and a

mean of 10% for the Story Only condition. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

There was no evidence of learning these idioms prior to training. P2 had an effect size of 100% for the Stories with pictures condition demonstrating highly effective treatment and 70% for Stories Only suggesting moderately effective using the PEM measurement.

The visual analysis of Verbal Explanation of Idioms graph shows that the level for baseline was stable, and both treatment conditions demonstrate level change. The trend in both conditions demonstrate level trend for baseline for both conditions but positive slopes for Stories with Pictures and Stories Only conditions. The slope is higher and steeper for the Stories Only condition. The variability in baseline demonstrated minimal variability in both conditions and increased variability in Stories with Pictures and Stories Only conditions. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

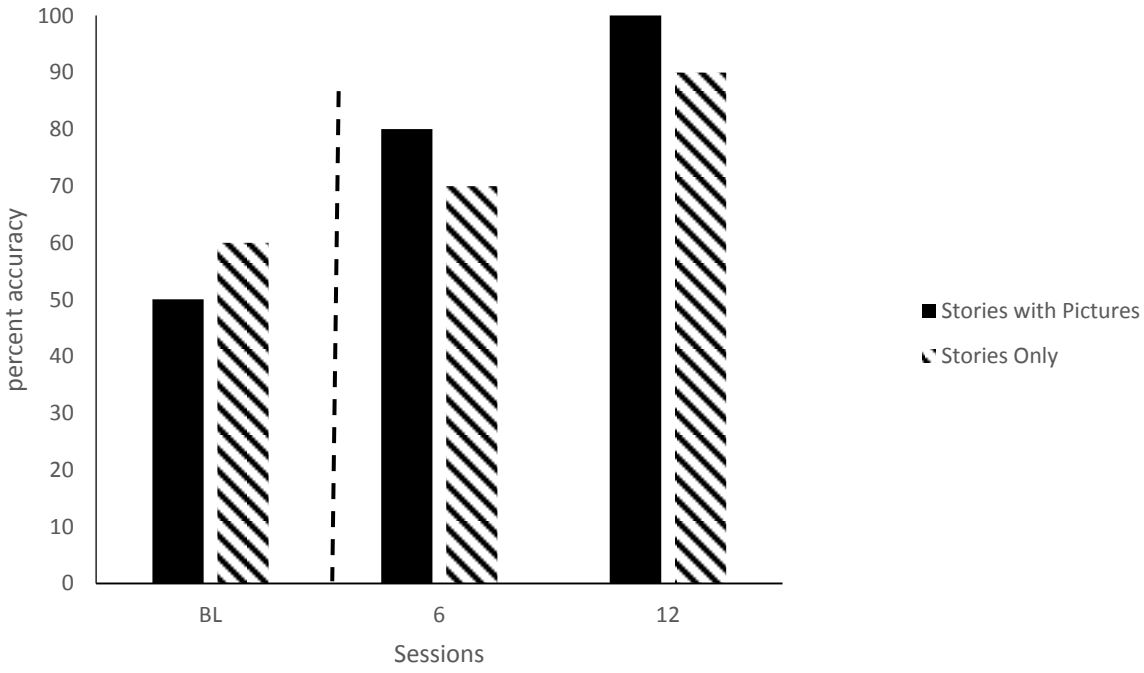
Research Questions Answered for P1:

- RQ1a. P1 did not directly benefit from written stimuli for comprehension of idioms.
- RQ2a. P1 did not directly benefit from picture stimuli for comprehension of idioms
- RQ1b. P1 benefitted from written stimuli for verbal explanation of idioms.
- RQ2b. P1 benefitted from picture stimuli for verbal explanation.
- RQ1c. P1 benefitted from written stimuli for generalization of idioms
- RQ2c. P1 benefitted from picture stimuli for generalization of idioms

Research Questions Answered for P2

- RQ1a. P2 did benefit from written stimuli for comprehension of idioms.
- RQ2a. P2 did not directly benefit from picture stimuli for comprehension of idioms
- RQ1b. P2 did benefit from written stimuli for verbal explanation of idioms.
- RQ2b. P2 did benefit from picture stimuli for verbal explanation.
- RQ1c. P2 did benefit from written stimuli for generalization of idioms
- RQ2c. P2 did benefit from picture stimuli for generalization of idioms

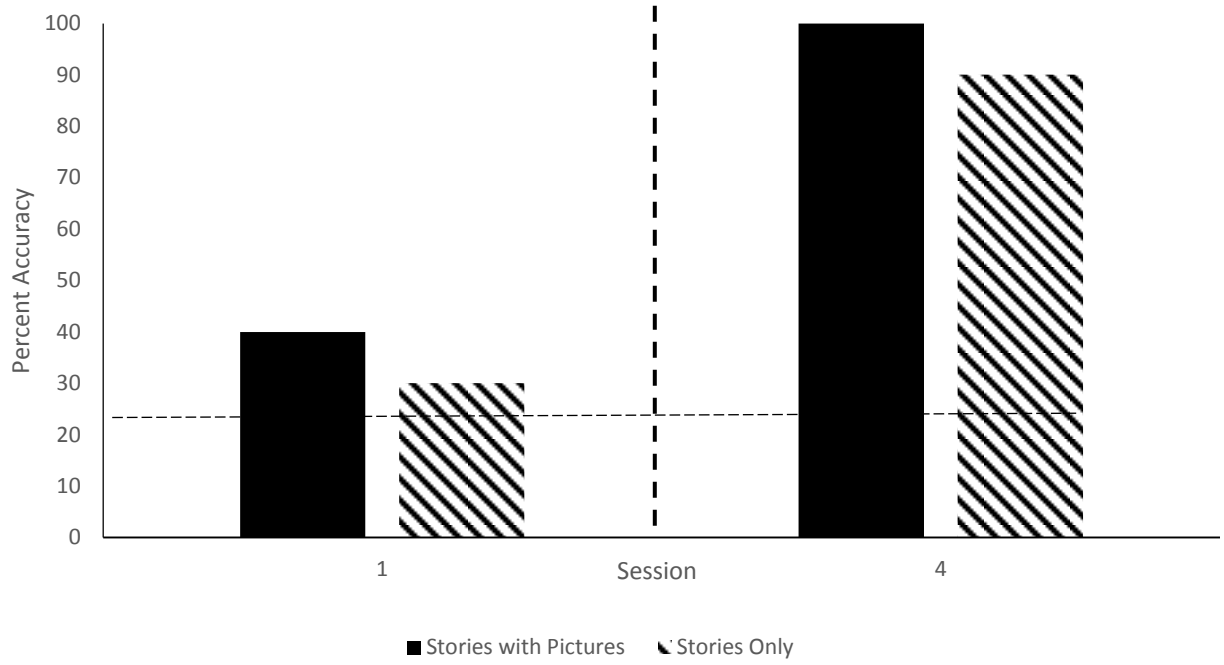
Figure 9. *Participant 1 generalization of idioms.*



In Figure 9, P1 Generalization of Idioms, the visual analysis only has one data point in baseline and two data points in treatment. The level for baseline from baseline into treatment

demonstrates level change for both treatment conditions. The trend in the Stories with Pictures condition demonstrates level trend but there is a positive slope for Stories Only condition. Stories. The variability from baseline to treatment demonstrated some variability in Stories with Pictures but Stories Only condition demonstrated significant variability. There was a mean of 53% for treatment using the Picture Condition and a mean of 40% for the treatment using the Story Only Condition.

Figure 10. Participant 2 Generalization of Idioms.



In Figure 10, P2 Generalization of Idioms, the visual analysis only has one data point in baseline and one post treatment. The level for baseline from baseline into treatment demonstrates level change for both treatment conditions. The trend shows positive slopes for

both conditions. The variability from baseline to treatment demonstrated some variability in Stories with Pictures but Stories Only condition demonstrated significant variability.

Figure 11. P1 Mean scores for Comprehension, Explanation and Generalization probes.

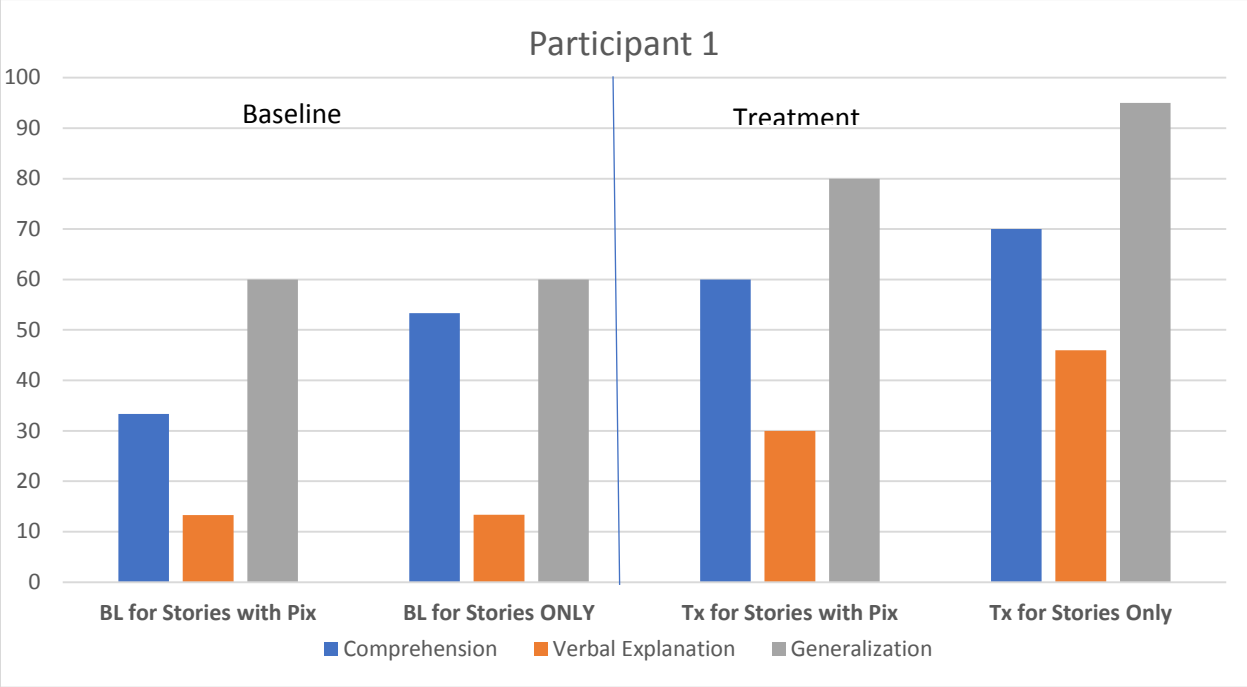
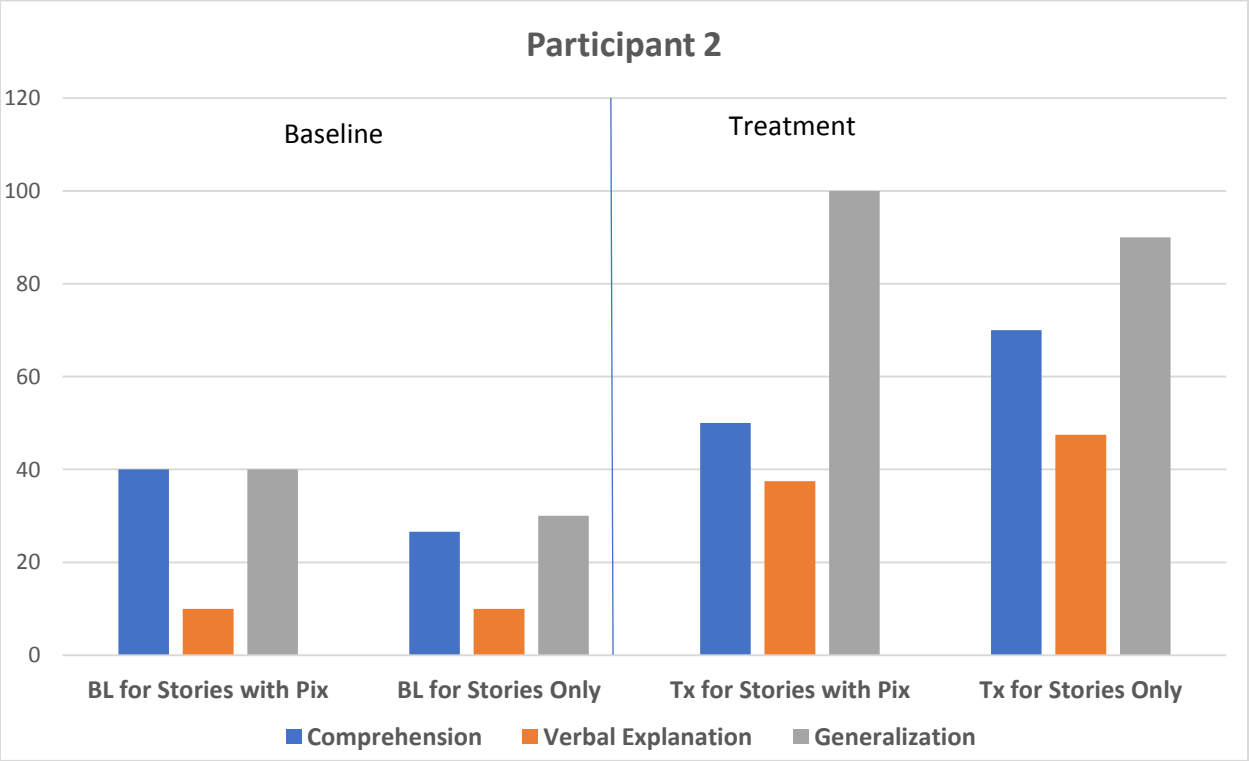


Figure 12. P2 Mean scores for Comprehension, Explanation and Generalization probes.



Item Analysis:

The results of the pre-and post-testing revealed that the P1 increased his raw score from 26 correct items to 40 correct items following 12 treatment sessions.

Table 13. *Participant 1 pre-post standardized subtest results of CELF V Metalinguistics Figurative Language.*

	Scaled Score	Percentile Rank	Raw Score
Pre-Test	7	16	26
Post-Test	11	63	40

In pre-testing (Table 14), Participant 1 explained 3 of 10 (30%) transparent idioms and 3 of 7 (42%) opaque idioms in the Open-Ended Figurative Language Item Analysis. However, in post-testing, he explained 5 of 10 (50%) transparent idioms and 7 of 7 (100%) opaque idioms

Table 14. *P1 Item analysis of open ended questions.*

Types of Idioms	Pre-Treatment	Post-Treatment
Transparent	30%	50%
Opaque	42%	100%

In the Multiple Choice Figurative Language Error Analysis (Table 15), P1 provided 1 opposite meanings for idioms in the pretest but only 0 opposite meanings in post testing; 1 literal meaning in pretest and 0 literal meanings in post-test; and 1 unrelated figurative expressions in pretest and 1 unrelated errors in post-test.

Table 15. *P1 Item Analysis of multiple choice responses*

Error Category	Pre-Treatment	Post-Treatment
Opposite Expression	1	0
Literal Expression	1	0

Unrelated Expression	1	1

Item Analysis of P2

The results of the pre-and post-testing (Table 16) revealed that the P2 increased his raw score from 31 correct items to 32 correct items following four treatment sessions.

Table 16. *Participant 2 Pre-Post Standardized subtest results of CELF V Metalinguistics Figurative language*

	Scaled Score	Percentile Rank	Raw Score
Pre-Test	10	50	31
Post-Test	10	50	32

In pre-testing, the P1 explained 4 of 10 (40%) transparent idioms and 6 of 7 (85%) opaque idioms in the Open-Ended Figurative Language Item Analysis (Table 15). However, in post-testing, he was able to explain three of 10 (40%) transparent idioms and six of seven (85%) opaque idioms.

Table 17. *P2 Item analysis of open ended questions.*

Types of Idioms	Pre-Treatment	Post-Treatment
Transparent	40%	30%
Opaque	85%	85%

1

In the Multiple Choice Figurative Language Error Analysis (Table 17), P1 provided four opposite meanings for idioms in the pretest but only two opposite meanings in post testing; zero literal meanings in pretest and zero literal meanings in post-test; and two unrelated figurative expressions in pretest and one unrelated error in post-test.

Table 18. *P2 Item analysis of multiple choice responses.*

Error Category	Pre-Treatment	Post-Treatment
Opposite Expression	4	2
Literal Expression	0	0
Unrelated Expression	2	1

RQ3a. Pilot 1, P1, and P2 demonstrated only slight decrease in errors in comprehension tasks in standardized testing for untreated stimuli.

RQ3b. P1 demonstrated improvement in verbal explanation tasks while Pilot 1 and P2 did not demonstrate change in standardized testing for untreated stimuli.

CHAPTER FIVE

SUMMARY & CONCLUSIONS

The focus of this study was to examine which of two treatment methods was more effective in teaching idiom interpretation, explanation, and generalization to children with SLI. Idioms are one type of figurative language. Idioms are a common, complex language structure contributing to success in academic and social contexts. A single-subject experimental design (SSD) tracked a short period of time to determine an initial treatment effect of intervention (Thompson, 2015). . Outcomes for comprehension, verbal explanation, and generalization of taught idioms were examined. The results of this study show that children with SLI can be responsive to visual cues – pictures or written explanations, that accompany stories read to them during teaching.

The verbal explanation of idioms was more reflective of two participants' learning and the pilot participant's learning. It is possible that he participants were better able to retain and recall the meaning of the idioms following repetition (frequency) of the treatment story conditions with and without pictures or that the task itself is more transparent. Comprehension of idioms may have been a more difficult task for the Pilot participant, P1 and P2 because a synonymous meaning of the idiom was provided rather than the actual meaning on the Comprehension Probes. Pilot 1 and P1 and P2 may have had difficulties with inferring the alternate meaning yet their ability to explain the idioms was far better based on the visual analysis of the graphs. It is also possible that the participants were using a different process to complete the Comprehension task on-line. For example, the participants had access to the story and the answers in the Comprehension task on-line. The participants may have been using the information provided to

narrow down a response rather than retrieve one from memory; whereas, the Explanation task required a response from memory.

The Pilot participant, P1 and P2 all demonstrated increased ability to generalize the idioms in both conditions demonstrating the ability to identify the idiom when a similar context is provided. The Figurative Language subtest from the CELF Metalinguistics test showed that the Pilot participant, P1 and P2 improved. P1 demonstrated the greater growth; however, he received 12 treatment sessions while the Pilot participant received five treatment sessions and P2 received four treatment sessions. P1 presented with the lowest language skills based on his age and gender but it is suggested that students with lower language scores may require a higher frequency of treatment sessions.

All three participants demonstrated improvement suggesting that either language intervention was beneficial; however, the idioms that were presented in the Stories Only condition suggested that these participants performed better. It is possible that the pictures used may not have accurately depicted the meaning of the idioms. Or, it may have been distracting to these participants. It is also possible that other types of visual scaffolds may be more beneficial for students with specific language impairments. Explorations of writing, drawing, and/or gestures may useful in helping students learn idioms better.

The participant's age may also play a role in the results of this study. Perhaps, one of these two types of treatment models may be more effective for younger children with specific language impairments. Perhaps, this age range and older students simply need exposure to the actual meaning of the idioms without the pictures.

Typically developing children may benefit from either of these two treatment conditions. Many TD students often learn idioms with pictures of literal meanings of idioms. It is possible

that students who are TD and learn idioms may increase their quantity of idioms in their knowledge bank with teaching the actual meaning with or without the pictures.

It is apparent that the Pilot participant and two experimental Participants benefitted from this study as they all gained knowledge of new idioms over BL. The results suggest that direct, explicit instruction can be beneficial for teaching idioms to students with specific language impairment. As stated in this paper, idioms are considered lexical units similar to words. Fast mapping (initial exposure) and slow mapping (repeated exposures) of idioms have helped the Pilot participant, P1 and P2 learn the idioms regardless of the condition but each child may benefit from a different scaffold depending on their individual needs.

Dosage and Intervention

It has long been asked what recommended amounts of treatment are necessary to achieve the optimal amount of language gains for students with specific language impairment. The question of dose, intensity and frequency and cumulative intensity of treatment has recently been introduced in current literature. It is an emerging area of investigation in intervention for communication disorders for children (Julien & Reichle, 2016). It has become increasingly more important to examine as it is essential to optimize treatment outcomes in various service delivery models such as school based therapy, private therapy, and hospital based therapy as evidence of treatment effects are often questioned by insurance companies, school administrators, and parents/guardians. The questions of group versus individual therapy have also arisen but evidence based research is limited. *Treatment intensity* refers to the amount of therapy that is necessary to increase age-appropriate language skills. *Dose* refers to the "volume of active ingredients present in each intervention session". *Frequency* refers to the number of sessions per

week or day intervention is provided. *Cumulative therapy* is viewed as "dose x frequency x duration x" to determine an "algorithm-driven dosage decision to optimize treatment for students with specific language impairment (Justice, Logan, Jiang, & Schmitt, 2017). The Justice et al, (2017) study is the first effort to provide empirical guidance on intensity of treatment for students with specific language impairment. Although there have been attempts at reviewing dosage, intensity, and frequency, there is a dearth of literature but there is a movement in the research field for communication science and disorders to examine this further. For example, McGinty, et al, (2011) focused on treatment for that examined high-frequency/low-dose and low-frequency/high dose intervention for literacy gains in early literacy in children, and were found to be superior to high-frequency/high-dose intervention treatments. However, to date, there are no studies that have examined the dosage and intensity of intervention for idiom learning.

Limitations

There were a number of limitations in this study. Only males that participated in the study. No females volunteered for this study. Of those males that participated, there were scheduling difficulties due to sports and other religious school activities that the participants were involved in during the course of the week; however, the families that participated in this study prioritized this research study and worked around their schedules so that the participants could achieve two sessions per week. Students were also seen after school which may have led to fatigue following a day of school and/or sports activities; however, that can also reflect "real world" treatment as many students who do receive private speech-language services after school are also tired from a day filled with sports or other activities.

Recruitment was problematic in the beginning of searching for potential research participants. A number of recruitment letters were sent to private SLPs and community boards as well as follow-up calls to remind private practitioners to publicly display these flyers, it appeared that "word-of-mouth" with private practitioners was a more effective method in recruitment. This may have led to selection bias that limited generalizability of the results

Due to the low number of participants, the SSED worked well as a method of tracking and analyzing performance. However, these results cannot yet be generalized to a greater population of students with SLI. Also, all three participants demonstrated varying degrees of severity of language impairment. Therefore, it makes it more difficult to determine whether these scaffolding interventions are effective for other students with mild or moderately impaired language impairment again making it difficult to generalize broadly.

Future Directions

This research study has provided further information about how students can benefit from different treatment approaches specifically how students can learn idioms whether they be in stories on stories with pictures. There are further explorations that could prove useful in extending this research to gather more data. For example, this particular protocol could be used in females in this age range. Perhaps, the female brains may benefit more from a visual image specifically pictures. Or, this protocol could be used with younger students for both males and females to see if pictures are more beneficial. Perhaps, this age range simply needs direct instruction with words only.

This study can also be extended to different populations with varying disorders such as high functioning autism, Asperger's Syndrome, Cognitive-Communication Impairments, or even students who are learning English (English Language Learners or ELL).

More single subject experimental designs should be used to gather more data to see if there is consistency among students with SLI and to determine how many sessions are necessary for various degrees of severity. Perhaps, this could lead to dosage recommendations. For example, if SSEDs demonstrate that students with mild degrees of SLI may need only four treatment sessions to learn idioms in stories with or without pictures, that could lead to making better recommendations in treatment plans for requests by parents, insurance companies, and data-driven school record keeping monitoring.

It might be useful to look at different idioms that are more popular in the current culture. Idioms are always developing as language is fluid and continues to evolve. There may need to be new studies to see which idioms are considered more familiar or easier to decipher. Idioms that are used in media and conversation might be more useful to teach children as the students will need to learn what these idioms mean so that it can expand their knowledge of current idioms.

This study also brought up new concepts. As these students were learning idioms, it was apparent via their comments and observing them in videotapes by both reviewers that they were truly interested in this process and how they were doing. A qualitative analysis would provide more meaning to what the students were thinking while they were being assessed and how they felt they performed. They could be asked which method they felt was more effective in learning

and why. They could explain how they were trying to retain the meanings of the idioms taught to them.

Retention of idioms learned in this study would have been valuable had these students been retested 3 months or 6 months following the study. Did they retain the idioms that they learned? Or, did short term memory serve its purpose during the treatment and students eventually forgot what they learned?

Functional MRIs would be another avenue to pursue. Perhaps, the students could undergo fMRIs to determine which specific areas of the brain light up when both conditions were presented to the client. It could suggest that specific areas of the brain may need to be stimulated more to strengthen the neural pathways to help students continue to learn idioms and other new lexicons.

Finally, this research study suggests that it has opened new ways of teaching figurative language specifically idioms in a well-controlled environment. Students were not exposed to teaching students idioms with pictures of literal meanings as is what is often taught in the current curriculum for general education students as well as in various workbooks for students with communication impairments. It appears that SSEDs were effective for examining each participant in how he responded to both conditions. Most importantly, this is a beginning of research to open our thoughts and ideas on how to best serve our students with language impairments so that we could make their lives easier for social communication, academic needs, and vocational services and become proficient, successful communicators.

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APPENDICES

Appendix A

Permission for Use of Stimuli from Dr. Marilyn Nippold

---------- ----------
From: **Marilyn Nippold** <nippold@uoregon.edu>
Date: Thu, Apr 23, 2015 at 7:38 PM
Subject: RE: Doctoral Dissertation at Seton Hall University
To: Monique Kaye <moniquekaye16@gmail.com>
Cc: nippold@uoregon.edu, nina.capone@shu.edu

Monique,

You have my permission to use the idioms from the attached MC task. The reference is provided.

This assumes that you will not publish the task, forward it to anyone, or use it for purposes other than your dissertation.

Best wishes,

M. Nippold

University of Oregon

Appendix B

Seton Hall University Institutional Review Board Approval Letter

OFFICE OF INSTITUTIONAL REVIEW BOARD
SETON HALL UNIVERSITY

July 18, 2016

Monique Kaye
[redacted]

Dear Ms. Kaye,

The Seton Hall University Institutional Review Board has reviewed your Continuing Review application for your research proposal entitled "Teaching Children with Specific Language Impairment to Understand Idioms."

You are hereby granted another 12-month approval, effective September 15, 2016. Your new stamped Consent Form, Assent Form, and Recruitment Flyer are enclosed.

The IRB also hereby approves the requested amendment to your research protocol to include pictures as visual stimuli in the treatment condition.

If any changes are desired in this protocol, they must be submitted to the IRB for approval before implementation.

Thank you for your cooperation.

Sincerely,

Mary F. Ruzicka, Ph.D.

Mary F. Ruzicka, Ph.D.
Professor
Director, Institutional Review Board

cc: Dr. Nina Capone Singleton

APPENDIX C

Letter to Speech-Language Pathologists

Dear

I am currently searching for clients with specific language disorders (ages 11-13) for a study that will examine how students with language learning difficulties will learn idioms better. In this study, the participant will learn 20 idioms in written and visual formats. The methods used will help determine a better way for adolescents to learn idioms that are important in the social and academic settings.

There will be two language sessions per week consisting of approximately 30 minutes each. The study will be completed in up to a maximum of six weeks depending upon the client's schedule. The participant will receive a $25 Amazon gift card at the completion of his/her participation. Participation will take place in the client's home. This is a great opportunity for students to volunteer their time for research purposes.

Parents are required to sign a "Consent" form and students must sign an "Assent" form. If you have a student or students that you feel would meet the requirements of this study, please feel free to contact me.

Thank you in advance for any referrals. Enclosed please find a flyer that you may distribute to your clients and/or display in your clinical setting.

Sincerely,

Monique Kaye, M.S., CCC-SLP
Licensed Speech-Language Pathologist
PhD Candidate, Seton Hall University
School of Health and Medical Sciences

Appendix D

Flyers

WE NEED 11-13 YEAR OLDS TO VOLUNTEER!

A Research Study is being conducted that will examine how students with language learning difficulties will learn idioms better. In our studies, the students will learn 20 idioms in written and visual formats. The methods used will help determine a better way for students to learn idioms that are important in the social and academic settings.

There will be 2 language sessions per week that last approximately 30 minutes each. The study will be completed in up to 6 weeks depending on your schedule. Each will receive a $25 Amazon gift card at the completion of his/her participation. Participation will take place in the client's home.

At your request, you can receive information regarding your child's results should he or she participate.

To inquire about our study, please call:

Monique Kaye, M.S., CCC-SLP
Licensed Speech-Language Pathologist
[redacted]

Seton Hall University
Institutional Review Board
SEP 15 2016
Approval Date

Expiration Date
SEP 15 2017

Appendix E

Parent Consent Form

SETON HALL UNIVERSITY
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CONSENT FORM

Teaching Children with Specific Language Impairment Idioms

Investigator: Monique S. Kaye, M.S., CCC-SLP

PhD Student, School of Health and Medical Sciences

Seton Hall University

South Orange, New Jersey 07079

Purpose: The purpose of the study is to see how children learn idioms better. Idioms are expressions that represent a special meaning. For example, *'it's raining cats and dogs'* means it is raining very hard. Children may learn idioms better with visual rather than verbal information.

Procedures:

Pre-Screening:

(a) A pre-screening will be given to the child to see if he or she qualifies for the study. These standardized language tests include the following:

- Clinical Evaluation Language Fundamentals V - Sentence Recall subtest, (Your child will be asked to repeat sentences)
- Clinical Evaluation of Language Fundamentals (Metalinguistics)– 5th Edition- Figurative Language subtest (Your child will be asked to answer questions that are related to figurative language such as idioms, similes, metaphors)
- Expressive One-Word Vocabulary Test (Your child will name pictures)
- Receptive One-Word Vocabulary Test (Your child will point to pictures that are named)

(b) The researcher will also request medical reports from the parent or guardian to determine if the child is eligible for the study.

Treatment: If the child qualifies for the study, then the child will be pretested on specific idioms. During the treatment phase, the child will be video-recorded that will include the child's face and voice. He or she will be asked to explain what the idioms means. Then, the child will be asked to read and listen to what the idiom means with a choice of four possible explanations.

In the treatment sessions, he or she will listen to and read stories with and without pictures that contain idioms. There will be 20 idioms in total. Ten will be presented in a verbal format and the other ten will be presented in a visual format. After the first treatment session, testing of these idioms will be conducted before each treatment session to see if the student has learned the idioms from previous sessions.

There will be two sessions per week that will consist of up to 30 minutes each. The maximum number of weeks is six (6).

Instruments: These formal language tests will be given one or two times during the study. The following language tests will be given to the child to see if he/she is eligible to participate in this study:

Voluntary Nature: The parent will grant permission for his or her child to participate in this study. There is no penalty for not participating or no completing the study.

Anonymity: Tests will only have the child's alpha-numeric code (for example, B4 will be used instead of Jane Smith) to keep his/her identity confidential. The researcher will be the only individual who can link the child's name to his or her records and will do so only in an extenuating circumstance.

Confidentiality: Results of the tests will be locked in a password-protected room at Seton Hall University. The video recording will only be used for research analysis purposes and will be destroyed at the completion of the study.

Records: All records will be kept confidential. Consent and assent forms that include the child's name will be locked in a file cabinet in a password protected room at Seton Hall University.

Benefits: There is no direct benefit of the study. However, your child may learn new idioms as a result.

Compensation: For the child's participation, he/she will receive an Amazon gift card in the amount of $25.

Risks: There are no known risks to your child for participating in this study.

Contact Information: The Principal Investigator is Monique S. Kaye, M.S., CCC-SLP ([redacted] monique.kaye@shu.edu). The Committee Chairperson for this research study is Nina Capone Singleton, PhD (973-275-2448; nina.capone@shu.edu). The Department Chairperson is Vikram Dayalu, PhD (973-275-2858; vikram.dayalu@shu.edu). The Director of the Institutional Review Board at Seton Hall University is Mary F. Ruzicka, PhD (973-313-6314; irb@shu.edu).

Print Child's Name: _____

Child's Date of Birth: _____

Print Parent/Guardian's Name: _____

I agree that my child can participate in this study:

_____ _____

Parent/Guardian Signature Date

Please provide your address so a copy of this Consent Form and the Child Assent form can be sent directly to you:

Mailing Address:

Name: _____

Street or PO Box: _____

City: _____ State: _____ Zip Code: _____

Home Phone: _____ Alternate Phone: _____

Seton Hall University
Institutional Review Board
SEP 15 2016
Approval Date

Expiration Date
SEP 15 2017

Appendix F

Child Assent Form

SETON HALL UNIVERSITY
1 8 5 6

ASSENT FORM

Idiom Comprehension Study

To be read aloud by the researcher:

My name is Monique Kaye, and I am a doctoral student at Seton Hall University. Please read the following information and, if you agree to participate, sign and print your name at the bottom.

To be read by the student:

My parents are allowing me to volunteer in a project. It is about learning idioms. Idioms are special expressions that have a special meaning. For example, *it's raining cats and dogs* means that it is raining very hard.

I will be asked to take some language tests to see if I can be in the study. Then, I will learn idioms by listening and reading stories. I will also listen to stories with pictures.

Each lesson will be about 30 minutes long. There may be two classes per week. I will be tested every week. It may last up to 6 weeks.

My participation will not affect my grades in school. I do not have to participate if I do not want to participate. I can stop at any time.

I understand that I will be videotaped. My name will not be used. The video recordings will be kept in a secure location. They will only be used to watch how the lessons were taught and how I learned.

School of Health and Medical Sciences
Department of Interprofessional Health Sciences and Health Administration
Tel: 973.275.2076 • Fax: 973.275.2171
400 South Orange Avenue • South Orange, New Jersey 07079 • *gradmeded.shu.edu*

I will receive a $25 Amazon gift card if I complete the study.

I will be given a copy of this form.

Signature of the Child: _____

Child's Printed Name: _____

Parent Signature: _____

Date: _____

APPENDIX G

Order of Idiom Complexity

Idioms Listed in Order of Complexity (Nippold & Rudzinski, 1993)

1-2	Strike the right note (93%)
1-2	Keep up one's end (93%)
3	Go around in circles (91%)
4-5	Put their heads together (87%)
4-5	Make one's hair curl (87%)
6-7	Blow off some steam (83%)
6-7	Skating on thin ice (83%)
8	Breathe down someone's neck (82%)
9	Put one's foot down (80%)
10	Hoe one's own row (79%)
11	Beat around the bush (73%)
12-13	Throw to the wolves (67%)
12-13	Paper over the cracks (67%)
14	Go into one's shell (66%)
15-16	Go against the grain (59%)
15-16	Have a hollow ring (59%)
17	Talk through one's hat (58%)
18	Blow the cobwebs away (57%)
19	Read between the lines (48%)

20	Rise to the bait (44%)
21	Cross swords with someone (39%)
22	Take down a peg (34%)
23	Vote with one's feet (19%)
24	Lead with one's chin (7%)

APPENDIX H

Idioms & Synonyms

IDIOM	Synonymous Meaning
Skating on thin ice	Take a big risk
Cross swords with someone	To fight with someone
Paper over the cracks	Make something work better but not deal with underlying problems

APPENDIX I

Verbal Explanation Probes

Examples:

What does it mean to skate on thin ice?

What does it mean to cross swords with someone?

What does it mean to paper over the crack?

Written permission from Dr. Marilyn Nippold from Nippold, M. A., & Taylor, C. L. (1995). Idiom understanding in youth: Further examination of familiarity and transparency. *Journal of Speech and Hearing Research, 38,* 426-423.

APPENDIX J

Comprehension Probes

Examples of Problems on the Forced Choice Probes:

Skate on thin ice:

Jeff had overslept and he didn't want to be late for school. He got dressed quickly, skipped breakfast, and jumped on his bicycle. Jeff rode down the driveway without wearing his helmet. His neighbor said, "You're *skating on thin ice*". What does it mean to *skate on thin ice?*

A. To make a bad decision
B. To be in a dangerous situation*
C. To almost miss something
D. To make someone angry

Cross swords with someone

Jacked owned a flower shop, and he kept it very clean. One day, Jack found trash from the bakery blocking his doorway. He talked to the bakery owner about the problem. Later, Jack said, “The bakery owner *crossed swords with me.* What does it mean to *crossed swords with someone?*

A. To tell lies
B. To be rude
C. To help someone
D. To argue or fight*

Paper over the cracks

While on vacation, Nan’s car broke down. A mechanic said the repairs would take four days because he had to order some special parts. Nan told the mechanic to fix the car today. The mechanic said, “I’ll *paper over the cracks.”* What does it mean to *paper over the cracks?*

A. To make temporary repairs*
B. To work very hard
C. To get help from others
D. To get the job done

---

*Correct

APPENDIX K

Generalization Probes

Laura had overslept and didn't want to be late for work. She got up quickly, skipped breakfast, and got into her car. Laura drove down the road without wearing her seatbelt. Her neighbor said, "You're _____"

a. Having a hollow ring

b. Skating on thin ice*

c. Breathing down one's neck

d. Hoeing one's own row

Minna owned a coffee shop, and she kept it very clean. One day, Minna found garbage from the sandwich shop blocking her doorway. She talked to the sandwich shop owner about the problem. Later Minna said, "The sandwich shop owner _____"

a. Struck the right note

b. Beat around the bush

c. Had a hollow ring

d. Crossed swords with me*

While on a business trip, Greg's tire was damaged. The tire dealer said that it would take two days because he needed a special tire for his car. Greg said to fix the tire today. The tire dealer said, "I'll _____"

a. Read between the lines

b. Go against the grain

c. Vote with one's feet

d. Paper over the cracks**

_____

***** Correct Response

Appendix L

Idioms with Stories ONLY Treatment Condition Stimuli

Skating on thin ice

Jeff had overslept and he didn't want to be late for school. He got dressed quickly, skipped breakfast, and jumped on his bicycle. Jeff rode down the driveway without wearing his helmet. His neighbor said, "You're *skating on thin ice*." He was taking a big risk.

Crossed swords with me

Jack owned a flower shop, and he kept it very clean. One day, Jack found trash from the bakery blocking his doorway. He talked to the bakery owner about the problem. Later, Jack said, "The bakery owner *crossed swords with me*." The bakery owner fought with him.

Paper over the cracks

While on vacation, Nan's car broke down. A mechanic said the repairs would take four days because he had to order some special parts. Nan told the mechanic to fix the car today. The mechanic said, "I'll *paper over the cracks*." The mechanic was going to make it work better but only deal with superficial issues, not the real underlying problems.

Appendix M

Idioms with Stories and Pictures Treatment Condition Stimuli

Introduction:

Listen carefully to the stories that I will read to you. Each story contains an idiom. I will tell you the idiom before I read the story to you and then the idiom will be read within the paragraph. The meaning of the idiom will be stated at the end.

Skating on thin ice

Jeff had overslept and he didn't want to be late for school. He got dressed quickly, skipped breakfast, and jumped on his bicycle. Jeff rode down the driveway without wearing his helmet. His neighbor said, "You're *skating on thin ice*." He was taking a big risk.

*Image taken from *Google Images*

Crossed swords with me

Jack owned a flower shop, and he kept it very clean. One day, Jack found trash from the bakery blocking his doorway. He talked to the bakery owner about the problem. Later, Jack said, "The bakery owner *crossed swords with me*." The bakery owner fought with him.

*Image taken from *Google Images*

Paper over the cracks

While on vacation, Nan's car broke down. A mechanic said the repairs would take four days because he had to order some special parts. Nan told the mechanic to fix the car today. The mechanic said, "I'll *paper over the cracks*." The mechanic was going to make it work better but only deal with superficial issues, not the real underlying problems.

*Image taken from *Google Images*