12-2016

The Effect of Prosody on Preschool Children's Emotional, Cognitive, and Behavioral-Eye and Behavioral-Body Engagement during Story Time

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THE EFFECT OF PROSODY ON PRESCHOOL CHILDREN'S EMOTIONAL, COGNITIVE, BEHAVIORAL-EYE, AND BEHAVIORAL-BODY ENGAGEMENT DURING STORY TIME

by

Trevor Rowe

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Family and Human Development

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UTAH STATE UNIVERSITY
Logan, Utah

2016

ABSTRACT

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by

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Utah State University, 2016

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Many children have insufficient early literacy experiences and fail to obtain proficient emergent literacy before they enter kindergarten. Reading to young children has been positively linked to improving their emergent literacy. Numerous factors influence how engaged children are while being read to including the adult's prosody, receptive vocabulary, and the home literacy environment. Using a quantitative quasi-experimental design, this study sought to understand the association among prosody, child engagement (emotional, cognitive, behavioral-eye, and behavioral-body), receptive vocabulary, and the home literacy environment. The sample included 76 3-5 year-old children from local child care centers and their parents. To understand the relationship between prosody and engagement, children were randomly assigned to watch a story with typical or high prosody. Emotional, cognitive, behavioral-eye, and behavioral-body engagement measures were used to understand how engaged children were in the story. Children's receptive vocabulary was assessed, and parents completed a home literacy

survey. The moderating effects of receptive vocabulary and the home literacy environment (i.e., how much time parents spent reading to children and children's TV time) between prosody and each type of engagement was examined. Children's engagement did not differ between typical and high prosody stories. A statistically significant relationship was found between the cognitive and behavioral-eye $r(74) = .44$, $p < .01$, cognitive and behavioral-body $r(74) = .30$, $p < .01$, and behavioral-eye and behavioral-body engagement measures $r(74) = .72$, $p < .01$. Receptive vocabulary and the home literacy environment did not moderate the relationship between story prosody and any type of engagement.

(162 pages)

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Many children have insufficient early literacy experiences and fail to obtain proficient emergent literacy before they enter kindergarten. Reading to young children has been positively linked to improving their emergent literacy. Numerous factors influence how engaged children are while being read to including the adult's prosody, receptive vocabulary, and the home literacy environment. Using a quantitative quasi-experimental design, this study sought to understand the association among prosody, child engagement (emotional, cognitive, behavioral-eye, and behavioral-body), receptive vocabulary, and the home literacy environment. The sample included 76 3- to 5-year-old children from local child care centers and their parents. To understand the relationship between prosody and engagement, children were randomly assigned to watch a story with typical or high prosody. Emotional, cognitive, behavioral-eye, and behavioral-body engagement measures were used to understand how engaged children were in the story. Children's receptive vocabulary was assessed, and parents completed a home literacy survey. The moderating effects of receptive vocabulary and the home literacy environment (i.e., how much time parents spent reading to children and children's TV time) between prosody and each type of engagement was examined. Children's engagement did not differ between typical and high prosody stories. A statistically

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ACKNOWLEDGMENTS

The path to earning my doctorate degree has been full of people who have guided, inspired, and supported me. I must first express my gratitude to my parents. Thank you Mom and Dad for instilling the value of education, encouraging me to get as much as I can, and supporting me throughout.

At Brigham Young University—Idaho I stumbled upon the Child Development Degree in the Department of Home and Family. I had great professors (Jim Green, Jim Gordon, Kathleen Gordon, Steve Dennis, Tom Rane, and Kathleen Gee) who inspired me to understand more about children and helped me come to class excited to learn. Thank you for bringing your passion to the classroom.

Thank you Bev, Jen, and Bobbi at Apple Tree Learning Center for taking the chance of hiring a male preschool and after-school teacher who only had little babysitting experience and one child development class under his belt. You allowed me to apply the great things I was learning and develop a love of working with and helping children. My experience there has continued to open up opportunities for me. I will always cherish my time I had with you and the children.

There are many people I must thank from my graduate school experience at Utah State University. I could not have made it through without my graduate student friends. You all made the classroom exciting, fun, and sometimes full of food. Thank you for the time we had to learn from and support each other.

I had great professors at Utah State University who love what they do and do it well. I would like to thank Dr. Ann Austin for her support, patience, and opportunities

she gave me. Thank you to all my other professors who took the time to help me understand the research and share their knowledge with me. I am grateful for the time you spent with me in class, in your office, and sharing wings with me.

Finally, I am thankful for my wife and family. Allison, thank you for being by my side, for your patience and love, and your example. You have stood by me with no reservations throughout some challenging times. Thank you Lola, Mary, and Charlotte for all the hugs, smiles, squeals, and laughter we have shared. At the end of the day, I knew coming home to my family would be the place of greatest support and love.

Trevor Rowe

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CHAPTER I

INTRODUCTION

Research has shown that reading to young children positively affects their literacy development. The practice of parents or teachers reading books to children is often referred to as "shared reading" and is widely regarded as beneficial for children in supporting emergent literacy (Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013; NELP, 2008; Price, Bradley, & Smith, 2012). Reading to young children can specifically benefit vocabulary development, reading comprehension, and phonological awareness, all components of literacy development (Cunningham & Zibulsky, 2011). However, there are other factors that can influence emergent literacy, including the style of reading, the conversations taking place between caregiver and child during the reading, and frequency of shared book reading (Neuman & Dickinson, 2011). Receptive vocabulary, or the child's ability to understand the spoken word, (Beattie & Manis, 2014), can also influence the child's emergent literacy, or literacy development, through the engagement and learning experienced during shared reading.

Children express their engagement in shared book reading differently, which may send unclear signals to the caregiver about their involvement and learning. For example, a child with high receptive vocabulary may show high active cognitive engagement, but low or varied, emotional engagement, as they may not be interested in the story even though they understand it. A child may have low receptive vocabulary and low cognitive engagement, but still show high behavioral engagement (sitting still, appearing focused) as they respond to a story read dramatically or to the appeal of the pictures and drawings. Children who are engaged emotionally, cognitively, and behaviorally may have a deeper

understanding of what is happening in the book and enjoy books more, but, to our knowledge, this assumption has not been tested with preschool children. Given the importance of literacy development to child development, more research would be helpful to further understand what influences engagement and the associations among the different types of engagement (i.e., behavioral, cognitive, and emotional). Understanding this will help parents and teachers better understand the markers of child engagement during shared reading in order to better enhance the child's understanding and enjoyment of books. In the sections that follow, national reading data will be discussed to make the case that we need to further understand how to engage children through shared book reading in order to increase interest, involvement, and proficiency in reading. Shared reading provides an environment between the caregiver and child that can facilitate literacy development. Through shared book reading children can improve their emergent literacy, phonological awareness, vocabulary, and reading comprehension (Neuman & Dickinson, 2011). Yet, if parents and teachers are unclear about the signals indicating child engagement, it can be difficult to track whether a child is as involved in shared reading as they appear to be.

A literate child is better able to communicate knowledge and feelings, opening up opportunities for future academic success and further development (Kutner et al., 2007; Lennox, 2013). The first five years are an essential time for children to learn foundational knowledge and emergent literacy skills that will carry them through the rest of life (Bowman, Donovan, & Burns, 2000; Dickenson & Porche, 2011; Rodriguez & Tamis-LeMonda, 2011). Emergent literacy includes the skills, knowledge, and attitudes that

facilitate future reading and writing (Whitehurst & Lonigan, 1998). Today in the United States, many children have insufficient early literacy experiences and fail to obtain proficient emergent literacy before they enter kindergarten. According to the Early Child Longitudinal Study—Birth Cohort, only 33% of preschoolers achieve proficiency on letter-recognition tasks (Snyder, Dillow, & Hoffman, 2009), an important baseline skill for the development of early literacy (National Early Literacy Panel [NELP], 2008).

The Minnesota Department of Education found only 50% of their children started kindergarten with proficient literacy ability (Minnesota Department of Education, 2013). Even worse, test results from Ohio show almost 60% of Ohio's children do not have a proficient grasp of prereading and writing skills as they are entering kindergarten (Ohio Business Roundtable, 2010; Ohio Department of Education, n.d., 2012). Using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), the Iowa State Department of Education found that 40% of students entering kindergarten were not proficient in beginning reading skills (Iowa Department of Education, 2012). Similarly, Louisiana used the DIBELS Next and found that 46% of their beginning kindergarteners were below proficiency level. Washington State found that, of the children entering public kindergarten, 48% had literacy skills of a 3- to 5-year-old, 6% had literacy skills of a 2- to 3-year-old, and 1% had literacy skills of a 0- to 2-year-old (Washington, 2012). The Idaho Reading Indicator found that 44% of beginning kindergarteners were below grade level (Idaho State Department of Education, 2012). Reading proficiency data were not found for Utah, the state in which this study took place. Thus, it appears that young children are not uniformly prepared to enter kindergarten based on their emergent literacy

skills, suggesting that additional research is necessary to understand the critical components of preliteracy development.

There are numerous benefits to shared book reading that will be discussed in the literature review; however, despite these benefits, researchers have found that it may not be a frequent experience in preschool classrooms and homes (Dickinson, McCabe, & Anastasopoulos, 2003; Russ et al., 2007). Childcare professionals recommend that caregivers read at least 20 minutes a day to children (Trelease, 2006). Despite this recommendation, among 2,061state-funded prekindergarten programs, it was found that teachers spent about 14 minutes a day reading to children (Early et al., 2010). Moreover, slightly less than half of birth to five-year-old children experience shared reading every day (Russ et al., 2007).

Researchers have examined ways to enhance the shared reading process. Dialogic reading and appropriate prosody are both informal practices that have been found to enrich this process. Dialogic reading is the discussion of the story during shared book reading, while prosody is the amount of expression used while reading. Dialogic reading and prosody promote a deeper understanding of what is happening in the book. Dialogic reading does this through conversation, while prosody does this through the changes in pitch, intensity, spoken word duration, and pauses. Both can occur during the shared reading process. Next, a definition of dialogic reading will be given and then prosody as it compliments dialogic reading, will be discussed.

Dialogic Reading

Dialogic reading is a specific practice that helps children become engaged during shared reading by allowing them to be active in the storytelling process (NELP, 2008). The process consists of three primary practices: (a) encouraging the children to participate through asking open-ended questions; (b) providing feedback such as recasting, reinforcing the children for their responses, and adding more information; and, (c) adapting the reading style to children's linguistic abilities, by, for example, asking questions on an appropriate level that challenges them (Hargrave & Senechal, 2000; Lonigan et al., 2013). When parents and teachers are involved in dialogic reading interventions, children's expressive language (Mol, Bus, de Jong, & Smeets, 2008; Whitehurst et al., 1988) and vocabulary (Hargrave & Senechal, 2000) increase. Children are also more verbally engaged during shared reading (Huebner & Payne, 2010). The National Early Literacy Panel's (NELP; 2008) meta-analysis of the benefits of dialogic reading interventions indicated medium sized effects on children's oral language skills and print knowledge supporting the impact of this intervention technique.

Due to these benefits, professionals recommend caregivers use dialogic reading during shared reading. However, the current body of research does not indicate a complete understanding of dialogic reading (Cunningham & Zibulsky, 2011; NELP, 2008). Dialogic reading research looks at the activities surrounding the reading (e.g., open-ended questions the caregiver asks) rather than the style of reading, or prosody. Prosody is an attention-getting component that engages children while the story is being read and between the dialogic reading activities. Research has examined dialogic reading

but not while accounting for prosody; rather, the focus has been on the questions asked and the feedback given to the child rather than the style of reading. The style of reading (prosody) has the potential to further engage the child in the book, hopefully leading to better comprehension and enjoyment of books. Research is needed to address how prosody influences children's engagement during shared reading (Lawson, 2012; Mira & Schwanenflugel, 2013) especially while taking into account other child variables such as receptive language level and home literacy experiences.

Prosody

The use of prosody is a way to informally engage a child while reading. To read a book with effective prosody is to read with high expression. Prosody entails perceived changes in (a) pitch, (b) intensity, also described as stress or loudness, (c) duration of spoken words, and (d) pauses within and between sentences (Benjamin & Schwanenflugel, 2010; Schwanenflugel, Hamilton, Wisenbaker, Kuhn, & Stahl, 2004). This research study examined two specific aspects of prosody, pitch and intensity, as it related to children's engagement (cognitive, emotional, behavioral-eye, and behavioral-body) in the reading experience.

Reading with an expressive prosody may be likened to child-directed speech (CDS) used by adults as they talk with infants and toddlers. CDS includes simplified grammar and words, but, like expressive reading, includes a higher pitch, exaggerated intonation, and a sing-song rhythm that an adult would not typically use with an older child or adult. CDS directs and attracts the attention of the child to the adult; infants and

toddlers prefer listening to it over adult-directed speech (Bornstein, Arterberry, & Lamb, 2013). Similarly, expressive reading may make a book more enjoyable to children and help them focus their attention on the story.

Research on prosody has typically involved studies of elementary school children with the child as the reader. One outcome of this research is that elementary children who read with prosody show better reading fluency, one of the components of literacy (Ardoin, Morena, Binder, & Foster, 2013; Benjamin & Schwanenflugel, 2010; Schwanenflugel et al., 2004). Less often studied is the type of prosody used by adults when reading to children. Teale (2003), Trelease (2006), and The National Association for the Education of Young Children (Copple & Bredekamp, 2009) all recommend that adults use effective prosody to engage children during reading, but few research studies have specifically examined how prosody relates to child engagement during shared readings, especially for preschool children (Lawson, 2012). Understanding this may guide caregivers to better engage children during shared reading on emotional, cognitive, and behavioral levels. This could lead to more interest in books and better learning.

In previous research there have been mixed (and sometimes subjective) ways of measuring appropriate levels of prosody. Two primary ways have been used to determine the appropriate levels. First, researchers have established what they believe is typical- and high-prosody by observing teachers reading to children. After observing the teachers, the researchers had stories read and recorded for children that contained what they judged to be similar typical- and high-prosody levels. Second, voice analysis software has been used to compare pitch and intensity levels between typical- and high-prosody stories. In

this study we used both ways of determining prosody level. Additionally, this study built upon past research by having an additional way of determining levels of prosody. Undergraduate students listened to either the typical- or high-prosody story and rated how expressive the story was with the outcome that their independent ratings confirmed the researcher's designation of high and typical prosody readings. The students were otherwise not involved in the research study.

Few research studies have examined the relationship between adult prosody and children's engagement, especially for preschool age children. For this reason, all prosody research will be reviewed here and in greater detail in Chapter II, despite the children's age not being within the range of this study. Similar to this study, child engagement is typically the dependent measure in prosody studies. In the Goldman, Meyerson, and Coté (2006) study, two 5th grade student groups watched a video of a story told through poetry and then recreated the story. The researchers posited that the lyrical natures of poetry (varied rhythm, intonation, stress, breath patterns, and pitch) is similar to a story read with expression (i.e., high prosody). Each group heard the story told with either high- or low-prosody elements; that is, the high-prosody story kept the original poetic elements while the low prosody used nonrhyming words, nonalliterative phrases, and replaced repeated phrases with phrases that disrupted the poetic aspects of the writing. Engagement was measured by student's ability to recreate the story in book form. Students who watched the high-prosody story were better able to recreate the story than children who watched the low-prosody story, including more about what the characters did in the story and more science and poetic content.

Moschovaki, Meadows, and Pellegrini (2007) studied teachers' live presentation of books to their students (3.5 to 5.5 years old). In contrast to Goldman et al. (2006), engagement was measured by students' spontaneous comments or paralinguistic cues (e.g., expressing emotion, such as laughing) during the reading. Ratings of teachers' presentations also served as a measure of prosody. Not surprisingly, when teachers presented the stories more vividly or dramatically, the story elicited more comments from their students.

The youngest children, to our knowledge, to be involved in a prosody study were four- and five-year-olds (Mira & Schwanenflugel, 2013). Expressive and inexpressive readings were created based upon the researchers' observations of preschool teachers and voice analysis software, analyzing pitch and intensity. The children listened to an expressive or inexpressive recorded reading of one of two stories. Similar to Goldman et al. (2006), the researchers also measured listening comprehension; however, rather than asking children to recreate the story by making a book, children retold the story or responded to questions about the book. Children who listened to the expressive version of the story had better recall as measured by their ability to retell the story or answer questions about the story. The sections that follow include a review of research on the association between adult prosody and children's engagement.

Engagement

The amount of time children spend in shared reading does not necessarily lead to measurable positive effects, but the best effects of shared reading are seen when children

are challenged to engage in and think about the reading (NELP, 2008). The optimal learning experience can occur when caregivers engage a child while reading aloud (Jalongo & Sobolak, 2011; Lennox, 2013; Moschovaki et al., 2007; Rodriguez & Tamis-LeMonda, 2011). Children engaged in shared reading discuss the story and find more meaning in it (Wiseman, 2011), or in other ways signal their engagement with the story line perhaps through emotional, cognitive, and behavioral (including body and eye movement) indicators.

Children who are read to early and often increase their literacy ability not just because of being exposed to a book and to language, but because of the particular strategies the reader uses to help the child stay engaged (Cunningham & Zibulsky, 2011). Engagement can be created through formal or informal activities that caregivers do with their children. Formal activities include parents discussing the name and sounds of letters in a storybook. These activities are more academic in nature when compared to informal activities that focus the child's attention on the messages depicted by the pictures or storyline and can include discussion. Dialogic reading, as previously discussed, would be considered an informal activity. It encourages discussion through open-ended questions about the story rather than focusing on the names and sounds of letters. For example, while a parent is reading to a child the parent will expand the meaning of the story or the child may ask questions about the meaning of certain words in relation to the story (Martini & Senechal, 2012; Senechal & LaFevre 2002). Dramatically read stories (i.e., high-prosody) may be considered an informal activity because there is no direct teaching involved. Rather, they help focus the child's attention and give meaning to the words that

are read. They set a tone and give context to what is happening. The child hears how words are used in a sentence, which may help the child decode word meaning.

The studies mentioned in the previous section measured engagement as a unitary construct. In most research to date, only one type of engagement is measured: emotional, cognitive, or behavioral. Only behavioral (Evans & Saint-Aubin, 2013; Mira & Schwanenflugel, 2013; vanderMaas-Peeler, Nelson, Bumpass, & Sassine, 2009), cognitive (Kim, Kang, & Pan, 2011; Lynch, 2011; Pearman, 2008), or emotion-related indicators of engagement are typically used in studies, but not all three together (Baroody & Diamond, 2012; Martini & Sénéchal, 2012). However, it is assumed that these indicators do not occur in isolation from each other. As children are behaviorally engaged, there is likely a level of cognitive and emotional engagement, yet the three have not been studied together. It is possible that when there is a high level of engagement shown by one marker, there will be high engagement shown by the others. Or, the markers may be independent of one another; that is, children who show a high level of one type of engagement may not necessarily show high engagement in all areas. Engagement should be examined from multiple points of view. This will help caregivers who take a multifaceted approach to child engagement better understand what they can do to enhance children's learning.

In this project, engagement was studied using four separate indicators: emotional, cognitive, behavioral-eye, and behavioral-body. Emotional engagement is a child's affective involvement with the story. This was measured through child self-report using prompts from a Likert-type scale of facial expressions to help the child express how

much they liked the story (Martini & Senechal, 2012). Cognitive engagement was measured by assessing the child's listening comprehension; this included asking the child what they remember about the story (Mira & Schwanenflugel, 2013). Behavioral engagement was measured in two different ways: (1) behavioral-body or the actions a child displays that reflect focused attention through body posture (leaning in and leaning out; Meagher, Arnold, Doctoroff, & Baker, 2008) and (2) behavioral-eye or focus of eyes (i.e., eyes focusing on a page or picture; Evans, Williamson, & Pursoo, 2008). This study used both types of behavioral-eye and behavioral-body engagement. Understanding emotional, cognitive, behavioral-eye, and behavioral-body engagement in this fashion provides a richer characterization of children's involvement in shared reading (Baroody & Diamond, 2012; Fredricks, Blumenfeld, & Paris, 2004; Guthrie, 2004). Previous research regarding the association between engagement and prosody during shared reading has not looked at emotional, cognitive, behavioral-eye, and behavioral-body engagement simultaneously; it is not understood how more or less expressive readings of a story relate to these different types of engagement. A highly expressive reading may better engage a child's attention and provide motivation to learn about a story and its characters. Children who are engaged emotionally, cognitively, and behaviorally (behavioral-eye and behavioral-body) may have deeper comprehension of the story and enjoy it more. Because of the important relationship between story-book reading and early literacy development, additional research is needed to better understand how prosody is manifested in all four indicators of engagement during shared reading

(Goldman et al., 2006; Lawson, 2012; Mira & Schwanenflugel, 2013; Moschovaki et al., 2007).

Receptive Vocabulary

It is likely that children's engagement in shared reading is influenced by their receptive vocabulary, the ability to comprehend the words that are heard or read. Children with high receptive vocabulary may show high cognitive engagement and will understand and remember much more about the story; however, they may show low emotional engagement if they are not interested in the story, just as children with low receptive vocabulary may show low engagement if they don't understand the story. Researchers have long acknowledged the importance of vocabulary knowledge and reading comprehension; the better children understand what is read to them, the more engaged they will be (Jalongo & Sobolak, 2011). Research has shown that vocabulary knowledge generally correlates with comprehension at .6 to .8; higher vocabulary knowledge predicts higher comprehension (Pearson, Hierbert, & Kamil, 2007). To our knowledge, none of the studies examining the relationship between prosody and preschool children's engagement have included a measure of children's receptive vocabulary, or their ability to understand spoken words. Receptive vocabulary may act as a moderating variable between prosody and engagement. Children's receptive vocabulary may increase the association between the prosody and cognitive engagement. On the other hand, children with higher receptive vocabulary may be cognitively engaged, but emotionally disengaged because the story is below their cognitive level, or they may

show high engagement on all three indicators. Without understanding the relationship of receptive vocabulary and prosody to children's engagement with story-book reading, one may not fully understand the complexity of shared readings (Wise, Sevcik, Morris, Lovett, & Wolf, 2007). This study seeks to understand the moderating effects of receptive vocabulary between prosody and engagement.

Technology

Children are likely to engage in activities that involve time in front of various types of screens (televisions, mobile devices, etc.), known as screen time (American Academy of Pediatrics, n.d.). On average, preschool children are exposed to about four hours of screen time each day (Tandon, Zhou, Lozano, & Christakis, 2011). Today, children have greater access to screen technologies than ever before. The percent of children, ages 0-8, who have access to mobile devices (e.g., smartphone, tablet) at home increased from 52% in 2011 to 75% in 2013. Nearly three out of four (72%) birth to 8-year-olds have a computer at home. Among children who have ever used a computer, the average age of first use is three and a half years old. In 2013, 28% of children had been read to on an E-reader or tablet device (Common Sense Media, 2013).

The current study used technology by having children watch and listen to a storybook reading on a laptop computer. Due to children's average experience with computers and other types of screens, we did not believe that the mode of delivery would influence children's level of engagement. Presenting the story via a laptop computer was

preferable because it would standardize the reading passage, ensuring that every child would hear exactly the same high- or typical-prosody story.

Home Literacy Environment

Young children raised in homes with literacy-rich environments tend to have better language skills. Literacy-rich environments include age-appropriate books (Burchinal & Forestieri, 2011), more books in the home, parents participating in shared reading (Mol & Bus, 2011), and parents' personal reading habits (Weigel, Martin, & Bennett, 2006). Children who have a literacy-rich home environment may show more engagement while being read to outside of the home than children who do not have that environment, or they may show less engagement because read-alouds are a common occurrence in their lives. A survey of home literacy practices is included in this research to determine if they are related to the children's engagement in the story. To our knowledge, this is the first study to include a measure of home literacy environment in a study of prosody and engagement.

Purpose of the Study

Reading to children is an effective way to build literacy skills, but further information is needed to better understand how to make shared reading more engaging; this information could lead to children's better comprehension and increased enjoyment of books. The purpose of this study is to fill in the gap in previous literature by (1) broadening our understanding of child engagement during book reading to include ratings

of emotional, cognitive, behavioral-eye, and behavioral-body engagement simultaneously; this will allow us to understand the association between and among these variables and broaden our general understanding of the engagement construct; (2) addressing how varying levels of prosody (high- and typical-) relate to measures of engagement for preschool-aged children; (3) understanding the extent that children's receptive vocabulary moderates the association between prosody and engagement; and (4) understanding the relationship between the home literacy environment and forms of child engagement during read-alouds. The information from this study will be helpful to parents, preschool teachers, and others who work with young children and are interested in supporting children's literacy.

Research Questions

This study will use a quantitative quasi-experimental design to understand the association among prosody, child engagement, receptive vocabulary, and the home literacy environment. The study will involve a three- to five-year-old preschool sample to answer the following questions:

1. Do children's emotional, cognitive, behavioral-eye, and behavioral-body engagement differ between typical- and high-prosody book readings?
2. Are there significant associations among the emotional, cognitive, behavioral-eye, and behavioral-body aspects of engagement?
3. Does children's receptive vocabulary moderate the associations between

typical-versus high-prosody book readings and children's emotional, cognitive, behavioral-eye, and behavioral-body engagement?

4. Do aspects of children's home literacy environment moderate the association between preschool children's emotional, cognitive, behavioral-eye, and behavioral-body engagement and typical- or high-prosody book readings?

CHAPTER II

REVIEW OF LITERATURE

Theory: Vygotsky

Shared book reading is important for children of all skill levels, but it is unclear if children with different skill levels, including receptive vocabulary skills, will engage in the same way during read-alouds; children with high receptive vocabulary may be more cognitively engaged than children with low receptive vocabulary. Most researchers believe shared reading is a sociocultural process. The interaction of culture and social processes lead to children becoming literate as a result of collaborations with more knowledgeable mentors (Cunningham & Zibulsky, 2011). Vygotsky's sociocultural theory will be used to understand how prosody relates to children's engagement during shared reading experiences.

Vygotsky proposed that development occurs as socially shared activities become internalized processes (John-Steiner & Mahn, 1996). Maturation is viewed as a secondary factor in development (Vygotsky, 1978). The association between social and internalized processes in Vygotsky's theory was detailed by Wertsch (1991) as having three major themes: (1) genetic analysis; (2) higher mental functioning driven by social interaction; and (3) individual and social action mediated by tools and signs.

Genetic analysis refers to the connection between the origin and history of a phenomenon. Only in understanding this does one understand mental functioning (Wertsch, 1991). Vygotsky (1978) describes the importance of understanding the origin

and process of human development rather than the product. Understanding the process allows us better to see the influence of culture on development. The process of human development is shaped through social and cultural contexts (John-Steiner & Mahn, 1996). The importance of early literacy skills has been emphasized in most cultures with written language. We know that human development follows different pathways dependent in part on skill level; Vygotsky's theory helps us ask in which ways. Using the social context of shared book reading, an interest in literacy/book reading might be transferred to children with varying skill levels. From a larger cultural perspective, early literacy is considered so critical that various federal programs, such as Early Reading First and Head Start, provide grants to child care programs to enhance early literacy education (United States Department of Education, 2012). Researchers continue to better understand the processes that help children learn the skills they will need to be prepared for school (Fernald & Weisleder, 2011; Welsh, Nix, Blair, Bierman, & Nelson, 2010).

Human development is driven through social interaction and starts with dependence on the caregiver. Through this interaction there is a transmission of knowledge and skills, with development occurring as these processes become internalized; this provides the base for future growth (John-Steiner & Mahn, 1996). Rogoff (1990) characterized the caregiver interaction as guided participation. Children learn through guided participation as an adult stretches children's understanding and skills to a new level. The guidance offered may be implicit or explicit and relates to what is valued in the culture. For example, an expressive reading gives implicit guidance, helping focus children's attention to the story (Lawson, 2012). Underlying the process of

guided participation is intersubjectivity, or joint attention between children and their more skilled partners. When there is shared understanding and problem solving, children are able to better comprehend and manage the daily requirements of the culture (Rogoff, 1990). In other words, the transmission of knowledge is not passive, as children are required to actively participate. An expressive reading is likely an engaging activity for most children; however, children's participation may vary depending on their vocabulary skills, their home literacy experiences or on their temperament, a variable not addressed in this study. In fact, research has failed to show that children with a lower vocabulary like shared reading any less than children with a higher vocabulary. Children with lower vocabulary may show their engagement in different ways and their engagement, while affective, may not be cognitive. Low-skilled children may appear to be engaged emotionally, but cognitively are not learning like other children. This may appear confusing to teachers as these children may appear to enjoy reading but may not fully comprehend the story line.

Within guided participation, adults build knowledge incrementally through scaffolding. Children of varying skill levels learn through scaffolding. Wood, Bruner, and Ross (1976) describe six functions of scaffolding:

1. Gaining the child's attention, interest, and adherence to the requirements of the task, including weaning away from other tasks
2. Reducing the size of the task to a level that is conducive to the child's ability, where the child may recognize his or her progression in the task
3. Redirecting behavior as the child gets distracted or loses interest

4. Interpreting discrepancies in what the child is producing and the ideal outcome
5. Managing children's frustrations
6. Demonstrating correct solutions to the task

Numbers one and four are of particular interest in this study. In regards to number one, expressive readings may help gain children's attention and better engage children in shared reading. Concerning number four, understanding the role of receptive vocabulary in engagement would help interpret the discrepancies between children's production and the ideal outcome. Children may appear behaviorally engaged, but, due to low receptive vocabulary, may not be cognitively engaged. Children with low receptive vocabulary may need to be encouraged on a cognitive level, or they may need the elements of the story broken down to more understandable pieces.

Understanding the role of prosody and receptive vocabulary in scaffolding can assist caregivers in engaging children emotionally, cognitively, and behaviorally. In this study, prosody will serve to gain children's attention and interest in shared book reading, allowing them to stay engaged. The role of receptive vocabulary as a possible moderator between prosody and type of engagement, will also be examined.

Scaffolding within the Zone of Proximal Development (ZPD) yields the best effects for learning. The ZPD represents the child's potential to learn. Skills and knowledge have not been fully developed in the ZPD and the child needs assistance from a more competent person to fully gain those (Bodrova & Leong, 2006; Vygotsky, 1986). The ZPD is dynamic and changing; as new knowledge is formed the zone takes on

different dimensions. The more competent partner must be aware of when knowledge is formed to properly scaffold within the ZPD (Berk & Winsler, 1995). Understanding the association between prosody, receptive vocabulary, and engagement will allow a caregiver to better scaffold within the ZPD.

The process of learning and mastering happens through the use of psychological tools. Tools are externally oriented and lead to activity on an object. Tools are inseparably connected to signs as they both act to accomplish a behavior. Signs are tools that aid memory or thinking. Juxtaposed to tools, signs are internally oriented and do not directly alter the object of a task. The most important sign is speech. This sign is inseparably connected to action; a child not only speaks about what he or she is doing, but speech and action combine to help the child problem-solve (Vygotsky, 1978). According to Vygotsky's theory, speech has been shaped over years of history and is a tool of thought that shapes itself; as children use speech, they increase their speech ability (Bruner, 2004). Speech plays an essential role in development and leads to higher cognitive functioning, obtaining goals, and mastering behavior. Speech during shared reading experiences has also been found to increase emergent literacy skills, phonological processing, vocabulary, and reading comprehension (Cunningham & Zibulsky, 2011). Vygotsky viewed the growth of language and its convergence with everyday activity as the most significant moment in the growth of intelligence. As children master the use of language, they are able to free their minds from what is directly before them, review the past, and think about the future. (Vygotsky, 1978).

Mediation

Signs mediate all aspects of learning (John-Steiner & Mahn, 1996); however, Vygotsky was not a stimulus-response learning theorist. Cole and Scribner (1978) explain that this link between stimulus and response is different than the behaviorist viewpoint:

> "What he did intend to convey by this notion was that in higher forms of human behavior, the individual actively modifies the stimulus situation as a part of the process of responding to it. It was the entire structure of this activity which produced the behavior that Vygotsky attempted to denote by the term 'mediated.'" (p. 14)

We cannot fully understand behavior without understanding the mental action that mediates it (Wertsch, 1991). Since speech may be thought of as a mediating action, in the current study, the child's vocabulary was measured to understand its moderating role between the adult's reading and engagement of the child. No other study to our knowledge has measured receptive language as a possible moderator between prosody and a child's during shared reading.

Attention

Attention underlies the use of tools and is an essential determinant of the success or failure of a task (Vygotsky, 1978). To understand attention, it is important to understand it within the process of development (Vygotsky, 1986). Attention is initially directed by adults, but, as the child learns language, attention becomes directed first toward others and then within the self (Vygotsky, 2004). As children learn words they are

better able to focus their attention, allowing them to take perspective and to think about past, present, and future actions (Vygotsky, 1986). Children learn to focus their attention on things that are considered culturally relevant (Vygotsky, 2004). The prosodic features of speech have the potential to draw children's attention to a story, allowing them to be better engaged and learn, thereby promoting their participation in a culturally relevant literacy task (Mira & Schwanenflugal, 2013).

Shared Reading

Since young children cannot read, parents and caregivers read to them. This process is referred to as shared reading (Mira & Schwanenflugal, 2013). Research continues to look at the impact of shared reading on various aspects of literacy development. Scarborough and Dobrich's (1994) seminal review of research questioned the wide-spread idea that shared reading has a significant impact on literacy development. In their review of three decades of research, they found correlations to be modest and to have short-term impacts, but it was difficult to distinguish if the results were due to the quality or quantity of book reading. The authors left it to the reader to decide if shared reading really is as influential as many claim and recommended further study that determines what aspects of shared reading are most influential.

NELP scholars (2008) conducted a similar review of research to understand the development of literacy and the influence of home and family. Their review differed slightly from that of Scarborough and Dobrich (1994) in a number of ways. It included only studies that: a) were published in English, b) provided quantitative data on children

within the normal range of development, c) studied the English language or other alphabetic languages, and d) included children between zero and five years old. Shared reading was found to have medium to high effect sizes on oral language (.73), print knowledge (.50), and writing (.52). Shared reading did not have a significant relationship with phonological awareness or alphabet knowledge; however, there have been too few studies to fully understand its impact on these variables. Similar to Scarborough and Dobrich, NELP researchers were surprised to find that the body of research focusing on the impacts of shared reading was so small. Few studies have been done that measure emergent literacy outcomes (e.g., phonological awareness, alphabet knowledge, readiness, and writing) or conventional literacy outcomes (e.g., reading comprehension, decoding, and spelling) relative to shared book reading.

Since NELP's (2008) review, research has continued to find positive results from studies examining further outcomes of reading to children. Zucker, Cabell, Justice, Pentimonti, and Kaderavek (2013) found that shared reading in preschool led to growth in children's receptive vocabulary. In addition, the researchers found that extra textual conversations during preschool readings were associated with children's vocabulary skills in kindergarten but were not significant in first grade.

Other research has found benefits to phonological awareness (Lefebvre, Trudeau, & Sutton, 2011), engagement with text (Morrison & Wlodarczyk, 2009), and reading comprehension (Kendeou, van den Broek, White, & Lynch, 2009). For further reading on the impact of shared reading, see Cunningham and Zibulsky (2011). The NELP report (2008) concludes that simply reading with children is not enough to improve their

literacy; more must be done to understand the process of shared reading and what teachers and parents can do during reading to improve literacy. Given the importance of early literacy, researchers must continue to explore what occurs during shared reading that might impact child literacy development (Zucker et al., 2013).

Dialogic Reading

Dialogic reading differs substantially from the traditional shared reading between adults and children. In traditional shared reading the adult reads the book to the child while the child listens. In dialogic reading the child is active in the storytelling process. For example, a parent may ask the child to tell the story rather than the parent reading it. The adult becomes the active listener, asking questions, adding information, and prompting the child to further describe material from the book. As the child's skill in storytelling increases, the adult asks more open-ended questions (Huebner & Payne, 2010; Mol et al., 2008; Whitehurst et al., 1994). In dialogic reading, the adult tries to foster the child's active role in telling the story rather than foster passive listening (NELP, 2008).

Whitehurst et al. (1988) originally studied dialogic reading through a home-based intervention designed to optimize parental book reading to children. Thirty 21- to 35-month-old children with typically developing language were selected to be in the study. Parents in the experimental group participated in classes where they were instructed to (a) increase open ended questions, function/attribute questions, and expansions; (b) respond appropriately to the child's responses; and (c) decrease straight reading and questions that

could be answered by pointing. The control group was asked to read as they typically would. Posttests were administered four weeks later and included the Expressive One-Word Picture Vocabulary Test—Revised (EOWPVT), the Illinois Test of Psycholinguistic Abilities (ITPA), and the Peabody Picture Vocabulary Test (PPVT). Significant group differences were found for the ITPA, $t(27) = 3.94$, $p = .0005$, and the EOWPVT, $t(27) = 2.51$. $p = .009$ (one-tailed). Differences on the PPVT were not statistically significant, $t(27) = 1.56$, $p = .07$.

Dialogic reading has been beneficial to children when parents are taught through self-instructional videos to use it. Arnold, Lonigan, Whitehurst, and Epstein (1994) studied 64 three-year-old children and their mothers. The children were pretested on standardized language tests: Expressive One-Word Picture Vocabulary Test—Revised (EOWPVT), and the Verbal Expression subtest of the Illinois Test of Psycholinguistic Abilities (ITPA-VE), the Peabody Picture Vocabulary Test-Revised (PPVT-R).

Families were randomly assigned to one of three groups: direct training, video training, and a control group. All groups were asked to read to their child at least four times a week during the six-week program. Mothers in the direct training group attended two instructional classes over a three-week period. Mothers in the video training were asked to watch two video trainings on the dialogic reading technique over the same period. All trainings were based on the findings of Whitehurst and colleagues' (1988) research.

At four weeks, standardized language posttests were conducted. The video group's EOWPVT and ITPA-VE test scores were higher than those of the control group

and indicated a statistically significant difference, $F(1, 59) = 7.35$, $p = .009$, $F(1, 59) = 6.83$, $p = .01$. The video groups' EOWPVT and PPVT-R scores were also higher and statistically significantly different from the direct training group, $F(1, 59) = 7.36$, $p = .009$, $F(1, 58) = 7.39$, $p = .009$, respectively. The authors concluded that video training is viable and provides an economical way of helping parents improve their children's literacy ability.

NELP (2008) examined shared reading interventions including the effect of dialogic reading, which was found to have a medium effect on oral language across a number of studies. This effect size was not statistically different than non-dialogic reading interventions. However, only studies using dialogic reading resulted in an average effect size that was statistically significant. NELP researchers determined that dialogic reading could be a useful intervention for parents and teachers to use. They concluded that more research is needed to understand how various interactive styles of reading affects children's learning.

Prosody

In recent years, prosody has received increased attention in the literacy research as a way to engage children during shared reading (Lawson, 2012). Reading aloud with expression or appropriate prosody gives meaning to what is said through varied pitch (frequency), intensity (specific emphasis on a syllable), and duration (length of the word and pauses between words; Benjamin & Schwanenflugel, 2010; Patel & McNab, 2010; Schwanenflugel et al., 2004).

Pitch

Pitch, also known as declination, is the fundamental frequency (F_0) of sound which corresponds to the vibration of the vocal chords (Himmelmann & Ladd, 2008). Pitch often declines through the course of an utterance and gives meaning to a statement or question (Ladd, 1984). The use of pitch helps children and adults decode and understand emotion (Morton & Trehub, 2001). Kern (2007) describes how the rise and fall of pitch also indicates turn-taking in speech between speakers.

Intensity

Intensity, also referred to as stress, is the property that places more emphasis on one syllable than another; the stressed syllable seems louder than the syllable next to it (Himmelmann & Ladd, 2008). Stressed words also tend to incorporate a change in pitch and duration (Ballard et al., 2012). By stressing a word, one can emphasize part of an utterance they feel is important for another to understand (Dowhower, 1991). Temperley (2009) describes three types of stress patterns: lexical, interlexical, and contextual. Lexical stress patterns are the normal stress patterns in words. Interlexical stress patterns refer to patterns between words, and how the final stress of one word affects the beginning stress of the next word. Contextual stress patterns are ones adjusted from normal lexical stress patterns and distributed to emphasize a point or allow ease of speaking. The different types of stress patterns are used throughout the English language but Temperley (2009) concludes a high variety is not necessary in day-to-day communication. Instead, a high variety of stresses are often used to give aesthetic appeal

in formal speeches or in poetry.

Duration

Duration includes how long it takes to say a word and the pauses between words (Himmelmann & Ladd, 2008; Krivokapi, 2007). Word duration is affected by the letters that make up the word as some letter sounds naturally take longer to say than others (for example, short versus long vowel sounds; vowels versus consonants; Himmelmann & Ladd, 2008). The punctuation of a sentence can also affect if words are drawn out or not (Dowhower, 1991). Speaking rate further influences the duration of words (Schwanenflugel & Benjamin, 2012).

In the current study two stories were created, each with a different amount of prosody: high-prosody (more expression) and typical-prosody (average expression). The elements of pitch, intensity, and duration were considered in creating the stories. However, due to limitations of software, only pitch and intensity were specifically measured.

Previous Prosody Research

Researchers have primarily studied how elementary children use prosody while reading rather than adult's use of prosody during shared reading with a child. As children read expressively they show higher fluency (National Institute of Child Health and Human Development, 2000). There is a growing interest in fluency stemming from the National Reading Panel's report that indicated fluency as a critical factor of reading comprehension (Applegate, Applegate, & Modla, 2009; Kuhn, Schwanenflugel,

Meisinger, Levy, & Rasinski, 2010; Patel, & McNab, 2010). Reading with more expression segments text into significant chunks of information, allowing the reader to have better reading comprehension. In order for fluency instruction to be effective it must move beyond accuracy and automaticity (Kuhn & Stahl, 2003). Other research has found that when children use more expression, they typically have effective decoding skills (Schwanenflugel et al., 2004). Good reading prosody may help in understanding more difficult text (Benjamin & Schwanenflugel, 2010), making it important that researchers continue their efforts to understand the role of prosody. For a thorough review of prosody's relation to reading fluency, please refer to Schwanenflugel and Benjamin (2012).

Little research has been conducted concerning how the adult's use of prosody affects child engagement during shared reading (Mira & Schwanenflugel, 2013), but researchers have speculated that it has a positive impact (Teale, 2003). Children hearing the effective use of prosody may have changing emotions as they are pulled into the story. Children's engagement may be seen through facial expressions and body postures (considered behavioral-body engagement) indicating an enjoyable experience (Lawson, 2012).

Only three studies to date have directly examined the influence of adult prosody on child engagement during shared reading. Two of the three studies have involved adults reading to elementary school children; the other was adults to preschool-aged children. Despite the differing age groups, the effect of prosody on engagement was still significant. Goldman and colleagues (2006) conducted a two-part study examining how

prosody relates to children's ability to recall a story. The researchers contend that the lyrical nature of poetry (rhythm, intonation, stress, breath patterns, and pitch, etc.) leads to a natural and beneficial prosodic reading that helps make the story meaningful to children. There were two parts of this research. Part one was an exploratory examination of the lyrical aspects of language and its influence on story recreation. Twelve 5th grade children, placed in six dyads, watched a video of a poetic story and recreated a shortened version of the story by making their own books. The books were analyzed for content features and lyrical aspects from the original story. All students were able to recreate the story and included the main parts.

The second study manipulated the amount of poetic elements the original story had, decreasing the poetic language. This change did not affect the storyline. A second group of 22 fifth grade students (from the same school as in study one) were put into two groups based on a matched-pairs procedure. Each group was asked to watch the more or less poetic version of the story. Similar to study one, the students were then asked to recreate the story using their memory and the pictures provided. Eighty percent of the children in the more poetic group attained medium and high book quality ratings. Only 36% of the children in the low poetic group received medium and high book quality ratings.

In contrast to Goldman et al. (2006), Moschovaki and colleagues (2007) studied teachers' live book presentations with preschool-aged children. Twenty teachers with classroom sizes of 10 to 20 children who were 3.5 to 5.5 years old participated in the study. All teachers read the same four books to the children and were audiotaped during

the readings. Two of the books were informational (*Fire* and *Life under Earth*) and two were fictional (*Winnie the Witch* and *The Three Little Wolves*). The authors coded prosody as pausing, the speed of reading, prolonging words, and pitch of voice. Books containing rhyming and questions were coded as part of the prosody variable. Children's reaction to the reading was coded as: (a) language play: spontaneous utterances where children were playing with language, repeating funny words, or engaging in rhyming play, (b) dramatization: children's spontaneous re-enactment of scenes or events from the story, and (c) personal engagement: emotional engagement such as the spontaneous expression of personal interest, pleasure, excitement, empathy or sorrow. Teachers used higher expression in the presentation of the fictional stories than in the informational ones. The teacher's higher expression also elicited more children's comments than teachers who read with lower expression.

Mira and Schwanenflugel (2013) also studied preschool-aged children but focused on the effect prosody had on children's story comprehension. Eighty-nine 4- and 5-year-old prekindergarten children were selected and placed into one of two conditions, expressive or inexpressive. In either condition, children were randomly assigned to listen to one of two books. The two books, *Forget-Me-Not* and *The Magic Rabbit* had similar themes and were slightly modified to be on the same developmental level. The selection of two stories allowed the researchers to examine whether the effect of expressiveness was story specific. Praat voice analysis software was used to differentiate between the expressive and inexpressive reading of the books. Expressive readings led to longer timed reading stories which may give children more time to process the story. To combat this

potential confound, the authors also created timed control readings of the books, inserting pauses into the inexpressive story and shortening pauses in the expressive story. The children listened to one story while an interviewer turned the pages. Children were then asked to recall the story and asked 12 cued recall questions. Cued recall questions give context to the question without giving away the answers. Overall, the children performed significantly better on a cued recall of expressive readings than on inexpressive readings.

The effective use of prosody during shared reading may be described as a performance-oriented style where a book is read dramatically to signal important points and distinctive voices are used to make the characters come alive. In contrast to dialogic reading, teachers ask questions before and after the reading rather than during (Zeece, 2007). Dickinson and Smith (1994) first used the term "performance-oriented" in their description of reading styles used in preschool classrooms of low-income children. In this study they examined the patterns of talk during shared reading between the teacher and the children. The relationship between the pattern of talk and the children's vocabulary and story understanding was then examined. They found that teachers used co-constructive and didactic-interactional reading styles that included significant talking during the reading of the book but little talk before and after. The co-constructive style included more open-ended questions while the didactic-interactional centered on closed-ended questions. Dickinson and Smith found that teachers' reading style fits into one of these three categories. One year after the teachers' style of reading was categorized, children whose teacher read in a performance-oriented style performed significantly better in vocabulary and story comprehension. Reese and Cox (1999) similarly found that

performance-oriented styles may help comprehension and vocabulary skills, depending on the child's initial abilities. In contrast, Brabham and Lynch-Brown (2002) found a more co-constructive approach led to greater gains in vocabulary than performance-oriented for elementary-aged children. The focus of the above studies was on understanding the teachers' reading style and use of questions and its relation to children's learning. Prosody was a secondary focus and was only accounted for in the performance-oriented style. More research is needed that focuses directly on prosody's influence during shared reading.

Engagement

Literacy engagement research is of two kinds: (a) the occurrences of children participating in literacy-related activities, such as the number of times a preschool teacher reads to his or her class in a day (Buhs, Welch, Burt, & Knoche, 2011; Chien et al., 2010; Lynch, 2011), and (b) measures of the degree of the child's engagement in a literacy activity behaviorally, cognitively, and/or emotionally relative to an outcome measure (Fredricks, Blumenfeld, & Paris, 2004). The current study examined the latter with regard to child engagement.

Fredricks et al. (2004) wrote extensively on the importance of engagement being measured as a three-fold construct. Measuring behavior, emotion, and cognition simultaneously is valuable in giving the engagement construct a richer characterization. These three components occur simultaneously and are not separate isolated processes. Engagement mediates the experience between children and the curriculum. A

multifaceted approach to engagement can further help caregivers understand the complexity of learning and help with targeted intervention. For example, if a caregiver understood that a child is cognitively engaged but not emotionally engaged, the caregiver could find books that relate better to the child's interest to draw him/her into the shared reading experience.

Very few research studies been conducted examining engagement the multifaceted construct described above (Lutz, Guthrie, & Davis, 2006). In a search of academic journals, few published research articles have actually used Fredricks and colleagues' (2004) suggested method of studying engagement as it relates to preschool literacy. To our knowledge none of the research uses their suggestions in a study of prosody.

Other research that measures multiple types of engagement has overlapping constructs. For example, emotional engagement indicators could be measured within the behavioral engagement construct rather than being a separate construct. The final measure of behavioral engagement includes emotional engagement. Moody, Justice, and Cabell (2010) examined engagement during varying types of shared reading experiences: adult led e-storybook, child led e-storybook, and adult led traditional storybook. Engagement was measured on three scales: persistence, enthusiasm, and compliance. Each scale examined the child's behavior during shared reading. Enthusiasm was demonstrated when the child smiled/laughed, turned pages, positively commented about the book, and showed excitement. Fredricks et al. (2004) contend that this type of measurement does not allow us to know the source of the emotion. In the above example,

the child may smile/laugh due to the interaction with the caregiver rather than as a response to the story.

Other measures rely solely on student self- or teacher-report rather than an "objective third party" to measure engagement (Lutz et. al., 2006). Clarke et al. (2003) measured kindergarten students' reading engagement using a teacher report scale called the Kindergarten Readings Engagement Scale (KRES). The scale asked about students' general learning, effort, happiness, and attentiveness while reading. The teacher was instructed to reflect upon individual student behavior rather than using direct observation. This method may prove unreliable due to teacher bias, including the halo effect. Further, although the scale covers emotional, cognitive, and behavioral engagement, it lacks the specificity that Fredricks, Blumenfeld, and Paris (2004) found necessary. Broad terms are used that give a vague understanding of engagement. For example, Clarke and colleagues measure cognitive engagement by asking, "How much is this student learning during reading activities" (p. 144) on a one to four scale; however, there is no definition of learning and how it relates to the teaching objectives. The current study seeks to understand engagement from a multiple construct viewpoint that includes emotional, cognitive, behavioral-eye, and behavioral-body indicators and used both self-report and third party measurements.

Behavioral-eye and Behavioral-body Engagement

Fredricks and colleagues (2004) found that behavioral-engagement is most commonly defined in three ways. The first entails positive conduct such as following classroom rules as well as the absence of disruptive behaviors. The second definition

includes involvement in learning and addresses effort, persistence, concentration, and contributing to class discussion through comments or questions. The third involves participation in learning activities. Since this study examines children's efforts to engage, the second definition, examining the physical behavior of children, was used.

Behavioral-eye engagement has been measured by examining eye movement during a reading session (Rayner, 1998). Measuring eye movement to understand visual attention is a practice that has been used with infants (Fantz, 1961; Frick & Colombo, 1996; Kwon, Setoodehnia, Baek, Luck, & Oakes, 2016; Mayer & Dobson, 1982) and preschool-aged children. Evans and colleagues (2008) examined how pointing to words with a finger draws preschool-aged children's eyes to the text rather than pictures. To code children's eye movements in the Evans et al. study, researchers slowed down the video and coded for (a) looking at a page with text, (b) looking at page with pictures, (c) not looking at the book, or (d) not looking at anything in particular because the pages were being turned. Interrater reliability between the looking times of both coders was established. The authors found that pointing to words increased the print looking time.

Technology has allowed for advances in measuring eye movement. Evans and Saint-Aubin (2013) used the Eyelink II system to measure if eye movements are related to vocabulary acquisition after repeated readings. As a book was read more often, eye movements began increasingly to focus on words rather than illustrations, which led to an increase in vocabulary.

Behavioral engagement can also be measured through body posture. Meagher and colleagues (2008) researched the relationship between maternal beliefs and behaviors,

and preschoolers' and kindergarteners' engagement during shared reading. A sample of 50 mothers and their five- to six-year-old children was obtained. Maternal beliefs were measured through a survey asking parents to report what grade they expect their child to receive in spelling and reading. After reading a book to their child, mothers were also asked about the process of the shared reading (i.e., "How important was it to you that your child: Learn something; Have fun; and Do it right" [p.145]). Mother observational measures included the emotional tone of the reading and the dialogic reading behaviors she used such as asking questions. Child engagement was a global rating that included focused attention, enthusiasm, and interest in the story, and body postures such as leaning in as opposed to leaning away. It was found that boys were more likely to be engaged in the shared reading when mothers rated "Having fun" to be an important part of reading.

While this study did examine body posture as part of behavior engagement, the global measure overlaps with emotional (enthusiasm) and cognitive (attention) constructs. This contrasts with Fredricks and colleagues' (2004) emphasis on separate engagement indicators. In the current study, only behaviors such as leaning in or out and eye gaze were used to measure behavioral engagement. These behaviors will be referred to as behavioral-body and behavioral-eye engagement, respectively.

Cognitive Engagement

Cognitive engagement tends to be measured through mastery of knowledge or showing effort in learning (such as persistence). The conclusion in the NELP (2008) report was that more complex measures of language skills, such as story comprehension, are better predictors of literacy skill than simple measures, such as vocabulary. However,

there is limited research examining the processes that influence children's comprehension abilities in the preschool years (Schickedanz & McGee, 2010). For preschoolers, comprehension can be measured through story recall (Mira & Schwanenflugel, 2013). Free recall and prompted recall have both been used in past research (Feathers, 2002; Kim et al., 2011; Mira & Schwanenflugel, 2013). Mira and Schwanenflugel (2013) used both in their study of prosody's relationship to cognitive engagement. Results showed that children scored significantly better on cued recall questions following the expressive readings; children who were asked free recall questions did not score significantly better on the expressive readings. Showing effort has also been measured as a cognitive construct of engagement. A concern with measuring a child's effort is the overlap with the behavioral engagement construct, particularly if effort is defined by gaze or body movement (Fredricks et al., 2004). For this reason, the mastery of knowledge measure was used in this study to assess cognitive engagement.

Emotional Engagement

Emotional engagement refers to the child's affective reactions including interest, happiness, boredom, sadness, and anxiety (Fredricks et al., 2004). Starting at age three and ending at kindergarten entry, Roberts, Jurgens, and Burchinal (2005) annually measured four home literacy practices: the amount of weekly shared book reading experiences, maternal book reading practices, the child's enjoyment of reading, and maternal sensitivity. A global measure of the home environment was also taken. Child enjoyment was measured through a parent report scale. A significant relationship was found between child enjoyment and receptive and expressive language at four years of

age. Emotional engagement may also be measured through a child's self-report. This is commonly done through a Likert-scale of drawn facial expressions (Fredricks et al., 2004).

Martini and Sénéchal (2012) sought to better understand relations among formal literacy (e.g., parent labeling letters) at home and parent expectations, child interest in literacy, and young children's early literacy acquisition. Children (N = 108, M age = 65 months) were shown pictures of unknown five-year-old children engaged in various literacy activities such as reading a book or writing letters. Children rated interest on a dichotomous scale by indicating liking (smiling face) and not liking (frowning face). Children's interest in these activities was a unique predictor of early literacy skills after controlling for parent teaching and expectations, SES, and child analytic intelligence.

Other researchers have also used facial expressions for child scales. Levy (2009) used a scale of three faces (unhappy, neutral, and happy) to study kindergarten children's liking of literacy activities at home and school. In the present study, children rated their liking of a book that was read to them using a scale of three faces, similar to Levy (2009).

As technology changes, children are more likely to engage with eBooks: books presented in electronic form on computers, iPads, Kindles, etc. (Duncan, 2011). Computer and live presentations of books have been found to similarly engage children (Moody et al., 2010). This technique is a common practice when examining child book engagement (Evans & Saint-Aubin, 2011; Goldman et al., 2006).

In contrast, Mira and Schwanenflugel (2013) had an interviewer turn the pages of a book while the child listened to an audio version of the story. However, this technique

brings a human influence that might affect the engagement of the child. For this reason, a video of a selected book was presented on a computer to the participants in this study.

Receptive Vocabulary

There is ample evidence that reading experiences benefit young children's receptive vocabulary knowledge (Evans & Saint-Aubin, 2011). A child's vocabulary knowledge will affect what they learn during shared reading experiences (Walsh & Blewitt, 2006). Researchers studied the relationship between text comprehension and memory skills in 44 four-year-old and 40 five-year-old preschoolers. They found that receptive vocabulary was a strong predictor of listening comprehension, explaining 22% of the variance in listening comprehension (Florit, Roch, Altoe, & Levorato, 2009). Children will be better engaged when they understand what is being read to them (Jalongo & Sobolak, 2011). As this study examined engagement by measuring listening comprehension, it is important to understand the role of receptive vocabulary. Previous studies examining shared reading and prosody have not accounted for receptive vocabulary. To further understand the association between prosody and children's reading engagement, the role of children's receptive vocabulary was examined in this study as a possible moderator.

Technology

The presentation of the book on a computer may add a potential confound to a study of child engagement in listening to book reading; children may be more engaged

due to the novelty of the computer. However, children have much more exposure to and experience with computers today than in the past. In 1984, approximately 11% of preschool-aged children had computers in their home compared to 79% in 2011 (Child Trends, 2012). In 2013, 40% of 0- to 8-year-old children had a tablet such as an iPad or similar device in their home on which electronic books could be read; this was up from 8% two years earlier. Similarly, 21% of 0- to 8-year-old children (up from 9% in 2011) have a device designed as an e-reader such as a Kindle or Nook (Common Sense Media, 2013).

Researchers recognize the challenge of studying the relationship between literacy and technology as technology is constantly changing; technology relevant to helping children's literacy one year may not be relevant to children just a few years later (Lankshear & Knobel, 2003). The use of computers has been linked to both positive and negative child outcomes. Preschool teachers must consider children's age, developmental level, needs, interests, linguistic background, and abilities for a computer game to have a positive influence on a child. Computers can be used as a learning tool in preschool classrooms. Developmentally appropriate use of computers can have positive impacts on children's cognitive abilities and even social skills by extending the learning in a similar way as other materials, such as blocks and manipulatives. Assistive computers have been used to provide equitable learning experiences for children with special needs (NAEYC, 2012). Computer-based early reading programs have also been found to help preschool children's emergent literacy and oral language skills (Huffstetter, King, Onwuegbuzie, Schneider, & Powell-Smith, 2010).

Computer use at home can also be beneficial for preschool-aged children. Adults talking to children about a story read on a computer combined with the story's interactive features and repetition can help children's literacy development. This is thought to be due to the effects of dialogic reading in traditional shared reading experiences (Salmon, 2014). A positive correlation between computer use and letter knowledge exists, even after controlling for cognitive and environmental factors known to affect the development of letter knowledge in young children (Castles et al., 2013).

Computer use at school has also been found to positively influence children's vocabulary. Kindergarteners have learned new words from listening to a story book read on a computer and from listening to a teacher. However, when comparing immigrant children to nonimmigrant children, immigrant children learned significantly more words when they were read to by a teacher than a computer. This may be have been due to the teacher's reactions to the cues of the children. For example, when children look confused, the teacher could stop and explain what was happening. The teacher could also encourage discussion when children reacted to the story in a positive manner (Segers, Takke, &Verhoeven, 2004).

A review of research from 2003-2009 concerning literacy and technology for children (0-8 years old) in educational settings found that literacy and technology research falls into three general categories: technology as deliverer of literacy, technology as site for interaction around texts, and technology as medium for meaning-making. Research focusing on technology as deliverer of literacy (i.e., computer programs to support the development of print literacy skills) found that children using computer

literacy programs did no worse than those who had received similar instruction from an adult. A sociocultural view of literacy and technology sees children's engagement with technology as contributing to the classroom culture. Computers can be used as a place for children to interact and examine text. Classroom computers helped teachers to see and understand the social dynamics of the children and encouraged children to learn and explore together. Technology was seen in some studies as a medium for meaning-making. This research found that computers could motivate children to work and learn, encourage discussion about text, and add to children's identity as they searched topics and read. There is a need for more extensive exploratory research that seeks to understand how technology relates to other dimensions of children's literacy learning Burnett, 2010).

Research conducted from 2003 to 2013 about how technologies influence young children's learning (0-8 years old) found technology had positive effects on children's performance across developmental domains. Approximately 88% of the studies investigated children's cognitive learning through computers. Of these studies, language and literacy have received the most attention. Seventy-five studies found technology had a positive impact on language and literacy while one found a negative result, 16 found no difference, and 32 found that positive results were mediated by variables such as adult engagement, children's ability to use technology, and children's previous experience. Similar to Burnett (2010), computers were found to enhance children's social interactions as children explored and discussed topics they learned about on the computer (Hsin, Li, & Tsai (2014).

A computer was used in this study to present a video of the selected book to each child. This video allowed for a standardized typical- and high-prosody reading of the story. Due to children's typical exposure to computers, the computer should not be a novelty that influences their engagement in the story. Further, the quasi-experimental design of the study will also help control for novelty affects.

Home Literacy Environment

A child's home literacy environment includes the various formal and informal literacy activities parents do with their child, the parents' and child's attitudes toward literacy, and the literary material that is available to the family (e.g., number of books). Children reared in homes with more of these types of experiences, attitudes, and materials are more likely to have better vocabulary, book comprehension, alphabetic knowledge, and phoneme awareness. As children enter school they are more likely to read earlier, have a higher interest in literacy compared to other children, and are more likely to read for pleasure (Burchinal & Forestieri, 2011; Senechal, 2011). In this study, a survey (Griffin and Morrison, 1997) was given to parents to measure the home literacy environment (see Appendix D).

Two variables from this survey, (parents reading to children at home and children's TV time) were selected to examine their moderating affects between prosody and each type of engagement. The more time children spend watching television, the less time they have for activities like shared reading. The majority of children spend a significant amount of their activity time watching television, so much so that they only

devote more time to sleeping (Moses, 2008). On average, preschool children spend 4.1 hours each day watching television. Children in home-based care tend to watch the most television (5.5 hours) followed by parental care only (4.4 hours), Head Start care (4.2 hours), and center care (3.2 hours; Tandon et al., 2011). The American Academy of Pediatrics recommends that preschool-aged children should be limited to 1-2 hours of quality programming per day (Committee on Public Education, 2001). The impact of television on children's development is mixed. Negative results include lower language and cognitive development and increased behavior problems, ADHD, aggression, and obesity (Jusoff & Sahimi, 2009). The positive results of television on children can include letter and word recognition and increased vocabulary, but positive and negative results are influenced by the amount of time children view television and the programs' content (Moses, 2008). The time parents read to children at home and children's TV time were selected as moderators between prosody and engagement due their potential effects on children's development.

The children's literacy material in the home must be age-appropriate for the child (Burchinal & Forestieri, 2011). An age-appropriate book for a preschool-aged child includes the following criteria: (a) conceptually challenging, encouraging children to construct meaning (Dwyer & Neuman, 2008), (b) a plot that allows for children to answer questions like "What happens next?" (Trelease, 2006), (c) rich vocabulary (Copple & Bredekamp, 2009), (d) relates to the interests and life experiences of children, and (e) colorful and detailed illustrations (Dodge, Colker, & Heroman, 2002). In this study, it

was determined that the book *Russell the Sheep* by Rob Scotton (2011) met the above criteria and was read to the children.

Summary

Shared reading can be a positive experience that leads to growth in literacy ability. There continues to be a need to understand the effects of shared reading experiences. Studies in shared and dialogic reading have been found to be helpful but do not include the impact of the prosodic features of reading text. Further, engagement in the shared reading experience has not been fully measured, consisting of overlapping and incomplete constructs. Using a quasi-experimental design, this study examined the effects of prosody on children's engagement, measured cognitively, behaviorally, and emotionally. It further sought to understand the role of receptive vocabulary and the home literacy environment in this process. The guiding questions of this investigation are as follows:

1. Do children's emotional, cognitive, behavioral-eye, and behavioral-body engagement differ between typical- and high-prosody book readings?
2. Are there significant associations among the emotional, cognitive, behavioral-eye, and behavioral-body aspects of engagement?
3. Does children's receptive vocabulary moderate the associations between typical- versus high-prosody book readings and children's emotional, cognitive, behavioral-eye, and behavioral-body engagement?
4. Do aspects of children's home literacy environment moderate the association

between preschool children's emotional, cognitive, behavioral-eye, and behavioral-body engagement and typical- or high-prosody book readings?

CHAPTER III

METHODS

Participants

Participants for this study were invited through two on-campus centers at Utah State University and two off-campus centers. Community child care centers were recommended by the Care About Childcare (CAC, formerly CCRR) office in northern Utah. All 3-5-year-old children (who had not attended kindergarten) and their parents were invited to participate. Siblings were not included; if siblings were in the same classroom, one was randomly selected to participate. Children with frank disabilities were not disallowed, but their data were not used for the study. Informed consent was obtained (see Appendix A; the Institutional Review Board has approved this study under protocol number 6092).

Consent forms were sent home to approximately 280 parents of 3- to 5-year-old children at the centers. Parents were informed of the purpose, procedures, risks, and benefits of participation. Participating children received a free book. A minimum sample size of 80 children was sought. Eighty-seven consent forms were returned for a response rate of 31%. This included three sibling pairs; one sibling was randomly selected to participate leaving 84 participants in the study. Fifty participants (59%) came from the on-campus sites while 34 participants (41%) from an off-campus childcare programs. The sample included 37 girls and 47 boys ranging in age from 36 to 67 months old (M = 53.2 months, SD = 7.36 mos.).

Stimuli

Book

Approximately 200 books from the Adele and Dale Young Child Development Laboratory were reviewed by the researcher. Books were examined for the following developmentally appropriate criteria: (a) conceptually challenging, encouraging children to construct meaning (Dwyer & Neuman, 2008), (b) a plot that allows for children to answer questions like "What happens next?" (Trelease, 2006), (c) rich vocabulary (Copple & Bredekamp, 2009), (d) relates to the interests and life experiences of children, and (e) colorful and detailed illustrations (Dodge, Colker, & Heroman, 2002). The author determined that *Russell the Sheep* by Rob Scotton (2011) fit these criteria. Child development professionals also judged it as developmentally appropriate for preschool-aged children (T. Rowe, personal communication, 2014). Although the main character is a male sheep, the story has both males and females in equally prominent roles.

Prosody

Multiple audio recordings were made of the story with two distinct levels of prosody. A female graduate student with past experience in theater agreed to read the story. The reading was recorded in a sound studio using Audacity software. Recordings were then divided into a typical- or high-prosody group. Sections of the typical reading were then pieced together to make a final typical-prosody version of the story. The typical version represents how some caregivers might read to their child; that is, in an engaged manner, but without much expression. Similarly, sections of the high-prosody

recordings were put together to make a final high-prosody story. The high-prosody version is more expressive and similar to a professional book reading in an audiobook. The proper levels of prosody were determined in three ways. First, similar to Moschovaki et al. (2007) and Mira and Schwanenflugel (2013), the amount of prosody was judged by the researcher to fit into a typical- or high-prosody group. This was done by reflecting on past experience reading with children and by observing preschool teachers read books to children.

Second, an anonymous online survey was posted for undergraduate students at Utah State University in two different Family, Consumer, and Human Development classes. Participating students (n = 148) were randomly shown either the typical- or high-prosody reading of *Russell the Sheep* through a YouTube video. They were then given the following prompt: "Books can be read with varying amounts of expression. Expression highlights the dramatic elements of a story; it tells the listener the meaning of a situation and shows feelings of characters. On a scale of 1 to 5, where 1 is low expression and 5 is high expression, how expressive was the story you just watched?" Students then rated the expression. In the typical-prosody reading, the average expression was 2.4 (SD = 1.1), with a range from one to five. In the high-prosody reading, the average expression was 3.6 (SD = 1.1), with a range from 1-5. Results showed a statistically significant difference between the stories, $t(146) = 7.06$, $p < .001$.

Third, Praat voice analysis software (Boersma & Weenink, 2014) was used to document the prosodic differences between the readings of *Russell the Sheep* (see Table 1) in terms of pitch and intensity. In the typical-prosody reading the average pitch was 189.88 hertz,

with a range from 67.12-500.52 hertz. The high-prosody reading had an average pitch of 243.53 hertz, ranging from 70.01-516.6 hertz. Mean intensity for the typical-prosody reading was 75.72 decibels, ranging from 31.48-89.61. Similarly, the average high-prosody reading intensity was 76.55 decibels, ranging from 29.37-92.09 decibels. After presenting the stories to the dissertation committee, it was determined that the prosody between the stories was too similar and another needed to be used. A second version of the typical-prosody story (Typical-Prosody Two) was made that lowered the mean pitch (see Table 1). Similar to Mira and Schwanenflugel (2013), in the readings the intent was to avoid a monotone or boring production. To accomplish this, readings were similar in intensity (i.e., loudness) but varied by pitch (i.e., frequency). Figures 1 and 2 portray a visual difference between the three readings. The blue lines in Figure 1 show an obvious difference in the variation of pitch between the typical- and high-prosody readings; this shows more pitch changes in the reading that is assumed to indicate greater expression.

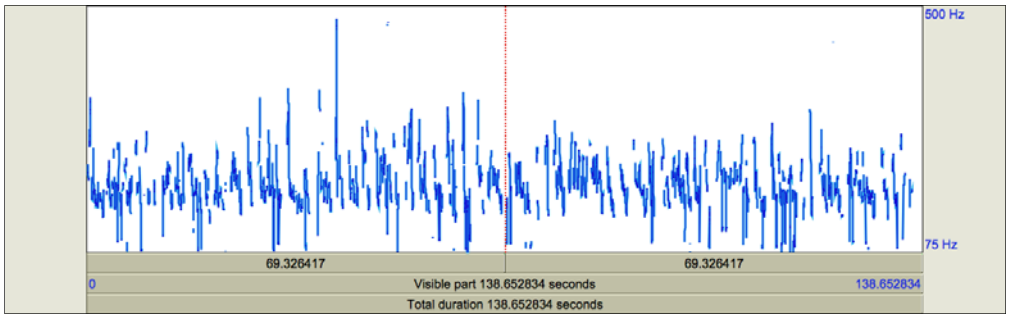
Table 1

Pitch and Intensity Data for Storybook Readings

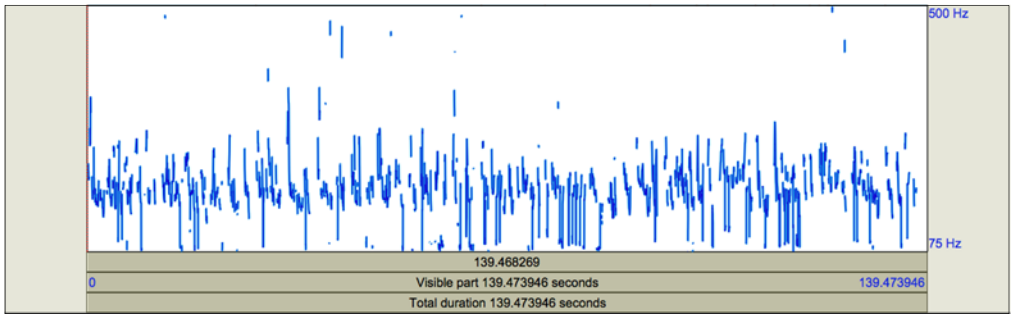
	Mean pitch[a]	Minimum pitch	Maximum pitch	Mean intensity[b]	Minimum intensity	Maximum intensity
Typical-prosody	189.88	67.12	500.52	75.72	31.48	89.61
Typical-prosody two	181.77	68.5	498.08	75.21	26.41	88.28
High-prosody	243.53	70.01	516.60	76.55	29.37	92.09

[a] Pitch measured in hertz (Hz)
[b] Intensity measured in decibels (dB)

Typical-Prosody



Typical-Prosody Two



High-prosody

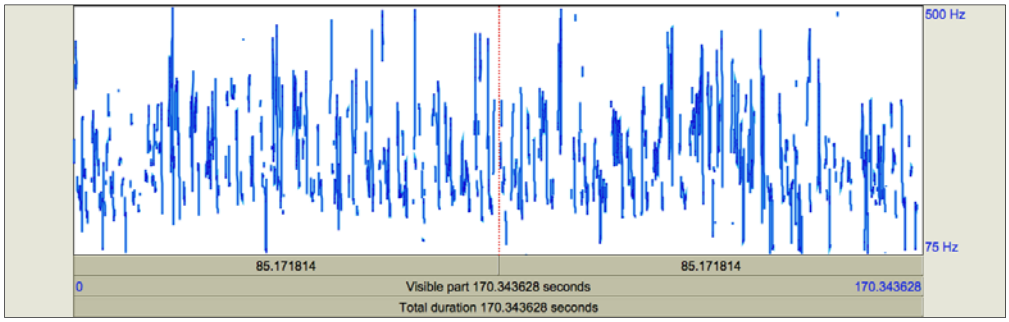
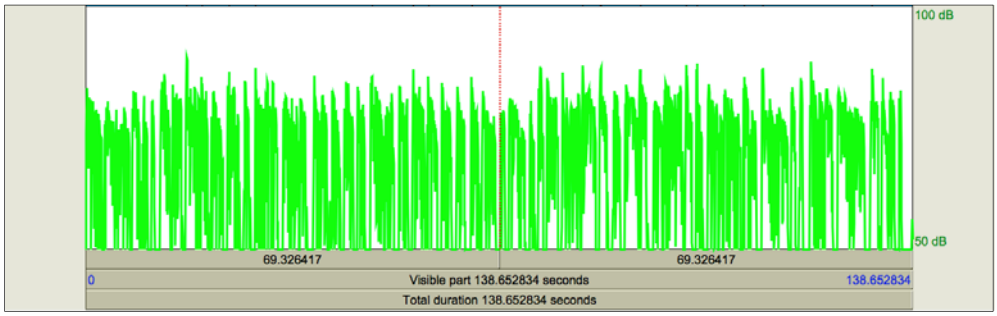
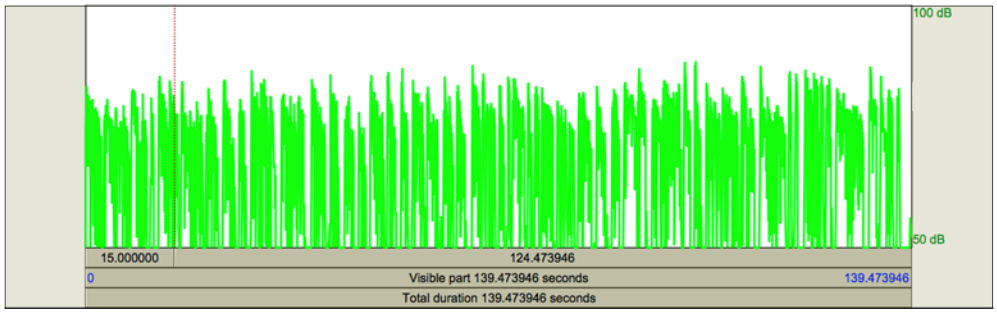


Figure 1. Pitch measured in hertz (Hz) for typical- and high-prosody in recorded storybook reading.

Typical-prosody



Typical-prosody Two



High-prosody

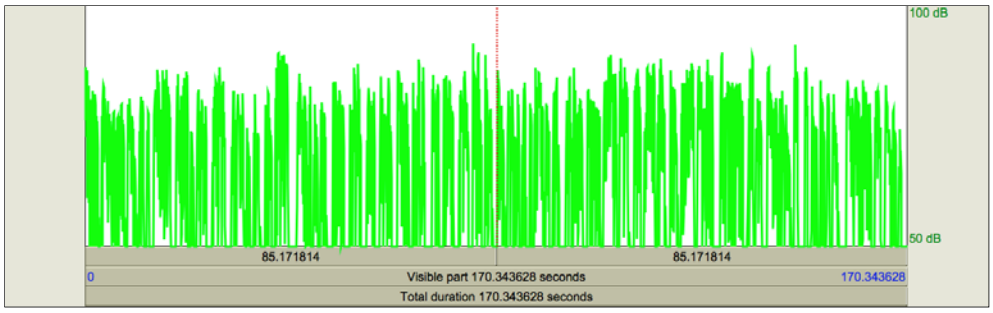


Figure 2. Intensity measured in decibels (dB) for typical- and high-prosody in recorded storybook reading.

Children were randomly assigned to hear the typical- or high- prosody version of the story. The book reading was presented as a video on a 13-inch Apple MacBook Pro computer.

The pictures from the selected story were digitally scanned into a computer at 300 dots per inch. Photoshop was used to combine pictures together. Two digital books were created using Keynote, a program similar to PowerPoint but for Apple computers. Each recording (typical- or high-) was combined with pictures from *Russell the Sheep*, matching the spoken words to the correct page. Children were able to see the pictures and the words on the page.

A blank slide was added to the beginning and end of the story. The first slide allowed the researcher to start the video and leave the room before the story started. When the video was over, the researcher came back into the room and conducted the emotional and cognitive assessments. The final blank slide allowed the screen to stay black rather than returning to the computer program, potentially distracting the child during the cognitive and emotional engagement measures. After the Keynote version of the story was created, it was exported as a QuickTime video for children to watch.

Measures

Parent Survey

Parents completed a survey covering demographic information and home literacy practices (Griffin & Morrison, 1997; see Appendix D). Nine demographic questions were asked to help understand family structure, ethnicity, and socioeconomic status. The home

literacy practices survey consists of nine Likert-scale questions about parents' reading habits, home literacy practices (e.g., time spent in shared reading, subscribing to magazines, owning a library card), and how much the child enjoys shared reading. Each item is scored individually and, by the authors' design, there is no combined home literacy score.

Receptive Vocabulary

Receptive vocabulary was measured by the Peabody Picture Vocabulary Test-(PPVT) 4th edition (Dunn & Dunn, 2007). The assessment is administered by presenting a child with four pictures on a flipchart. The researcher says the name of one of the pictures and the child indicates the matching picture. The PPVT has been normed for ages 3-91. According to the manual, the average assessment completion time is 10-15 minutes. Construct validity, as compared to the Clinical Evaluation of Language Fundamentals—Fourth Edition and the Expressive Vocabulary Test—Second Edition, ranges from .67-.84. Alternate form reliability by age is .89. Split-half reliability ranges from .94-.95. Test-retest reliability by age is .93. (Pearson Education, 2013). Children were assessed on two different days to decrease the chances of fatigue. On the first day the children were tested with the PPVT. On the second day they watched *Russell the* Sheep and were administered the engagement measures.

Engagement

Engagement was measured by behavioral-eye and behavioral-body items, cognitive items, and emotional engagement items (See Appendix C for full measure). A

preliminary study (to be discussed below) helped refine the measures. Behavioral-eye and behavioral-body engagement was measured by examining body posture/movements and eye gaze. All behavioral-eye and behavioral-body engagement was recorded by an Apple iSight camera and saved to a secure external hard drive. The camera was located on top of the computer screen that the children viewed. All recordings were made using Quicktime. Each child was centered in front of the computer screen, approximately two feet away.

To better understand the child's eye gaze while watching the story, a comparison video was made. The researcher asked each child to follow the researcher's finger around the outside of the screen with his or her eyes. The comparison video allowed the researcher to know when the child is looking outside of the computer screen while watching the story presentation. When the child's eyes went to or past the outside of the screen, the researcher knew that the child's eyes were no longer looking at the story. Researchers coded that video after the presentation of the typical- or high-prosody story and used the comparison video as needed. Eye gaze was measured on a five-point scale: 1 = Not engaged; child is not looking at the screen; 2 = Child is looking at the screen less than half the time; 3 = Child is looking at the screen at least half the time; 4 = Child is looking at the screen more than half the time but not the entire time; 5 = Completely engaged; child is looking at the screen the entire time. Reliability of a similar eye gaze measure found an inter-rater reliability of $r = .995$, $p < .001$ (Evans et al., 2008). Raters measured posture/movements on a five-point scale: 1 = Not engaged, child's body is slouched, may lay head on desk/table, child is fidgety all the time; 2 = child's body is

slouched, may lay head on desk/table, and child is fidgety less than half the time; 3 = Sometimes engaged, child's body is slouched, child appears fidgety at least half the time; 4 = Child is sitting still and upright more than half the time; 5 = Always engaged, child is sitting still and upright the entire time. Reliability for behavioral-eye and behavioral-body engagement in similar measures have found an inter-rater reliability of $r = .72$, $p < .05$ and $\kappa = .64$, $p < .05$ (Deckner, Adamson, & Bakeman, 2006). Research assistants rated behavioral-eye and body engagement on every 30 second video clip as indicated by the timer (see Appendix C); this amounted to six eye and body posture observations. Thirty-second clips were determined to be appropriate due to the general abilities of preschool-aged children to focus their attention.

The cognitive engagement measure was based on Mira and Schwanenflugel's (2013) measure of cognitive engagement during expressive readings (psychometric data were not provided by the authors). After the child watched the story, a researcher asked the child six cued recall questions and recorded the answers on the questionnaire (see Appendix C). Cued recall questions allowed the researcher to give context to the question without giving away the answers. Mira and Schwanenflugel (2013) found that cued recall leads to more detailed responses from children as compared to free recall. The goal of these types of questions was to reflect the range of understanding within comprehension. Mira and Schwanenflugel found the intraclass correlation reliability for the cued recall questions between two raters was .913, indicating excellent agreement. Two types of cued recall questions were asked, plot and inferential. Plot questions, as compared to inferential, are easier because they require an understanding of explicit information from

the text. Inferential questions are more difficult because they require the child to understand the story's implied meanings and are based upon the reader's background knowledge.

Emotional engagement was measured using a 3-point scale of facial expressions (Levy, 2009; psychometric data were not provided by the authors). After the presentation of the story, the researcher helped the child become familiar with the scale by relating simple drawings of three basic facial expressions—happy, neutral, and sad—to the child's experience (for a full description, see Appendix C). For example, each child was asked "What are some of the things you like very much? What does your face look like when you like [insert child's answer]." The child was presented with the pictures of the happy, neutral, and sad facial expressions and allowed to choose which face best represented their answer to the questions posed about the book. Researchers asked: (a) How much did you like the story? (b) How much would you like to listen to it again some other time? (c) How much would like to have your mom or dad read this story to you?, and (d) How much would you like to tell this story to a friend?

Preliminary Study

A preliminary study was conducted to examine the engagement measures. Five children participated in the study. This included recording the children while watching one of the versions of the story to assess behavioral-eye and behavioral-body engagement and administering the cognitive and emotional engagement measures. The preliminary study led to several changes in the tool with the intent of helping researchers be more

effective in administering and scoring the engagement measures. During the preliminary study, it was discovered that recording answers on the emotional engagement tool could lead to potential errors in entering the data into SPSS. In the preliminary study, the researcher drew the facial expression the child chose for each question. A neutrally drawn expression could be interpreted as happy or sad if the mouth line turned up or down on the ends. A facial expression scale was added to each prompt that mirrored the options the child had; the researcher then circled the child's answer rather than drawing the face.

The preliminary study also led to changes in how questions were asked to the children. The purpose of the changes was to help children better understand the questions in each scale. It was important for all participating children to have a basic understanding of what each facial expression meant for the emotional engagement measure. In the preliminary study, children were shown each of the three facial expression cards and asked, "How do you feel when your face is like this?" Children often did not know how to interpret the neutral facial expression. For the final emotional engagement measure, the children were given a prompt that included the name of the emotion and asked to choose a card from the three choices. For example, "What are some things you think are just okay? What does your face look like when something is just okay?"

A change was also made to the cognitive engagement measure. A question in the cognitive engagement measure read "What did Russell do to help him fall asleep?" To the children in the preliminary study, this question appeared to be asking for just one example. This may have been confusing due to Russell trying nine different ways to help him fall asleep. Children gave one answer and were then prompted with "Do you

remember anything else," After being prompted they typically gave more answers. In the final measure the question then changed to read "Russell tried many things to help him fall asleep. Please name all the ones you remember." The researcher prompted the child up to two more times by saying "What else do you remember?" if the child did not say more than one answer.

The preliminary study also revealed a problem in the Keynote presentation not correctly presenting the sound on the typical and high versions of the story. On the first page, the sound would cut off early and the child would not hear all the words. To help correct this, the Keynote presentations were converted to video files.

Procedures

Consent

A letter of consent to the child's parents was written for the Institutional Review Board review. This letter included the purpose, procedures, benefits, and all other pertinent sections of a letter of consent. A script that details what to say to parents, children, and providers during the research process was also created (see Appendix E). The consent form, script, and dissertation proposal were then submitted for IRB review through Protis.

Participants for this study were invited through two on campus centers at Utah State University and two off campus centers. Community childcare centers were recommended by the Care About Childcare (CAC, formerly CCRR) office in northern Utah. As the proposal was being reviewed by the IRB, CAC was asked for their

recommendations on which childcare centers should be contacted. The intent was to select an economically heterogeneous mix of centers that have been cooperative in the past and have space available to conduct the study. Upon their recommendation and using the script given to IRB, the managers/owners of three centers were contacted about the study, and permission to contact the parents was requested. Two of the community childcare center directors agreed to participate. The third center director indicated that they would not be able to participate because center's board would not be meeting to give approval before the study needed to be conducted. Following the script, all providers were asked how they would like the parents to be contacted. Three providers preferred to send home the letter with the child and one center had their teachers hand the letter to the parents as the parent came to pick up their child.

Parent Assessment

After consent forms were received, parent surveys were placed in each child's cubby or directly handed to the parent to be completed at home. If surveys were not returned within a week, another survey was sent home. Sixty-four surveys (76%) were returned after multiple solicitations by the researcher, teachers, and managers at the programs.

Conducting Child Assessments

A team of undergraduate student researchers was organized to assist with the study's assessments. Students received IRB training, were trained in proper child assessment, and were taught how to administer the various assessments. Each student

practiced administering the assessments at least six times and went through a debriefing afterwards.

After gaining approval from the IRB, consent forms and home literacy surveys were sent home with participating parents. Parents were asked to return the forms within a week. The procedures recommended by the programs (i.e., sending letters home with the child) were used depending on the program's preference.

As consent forms were returned, participant information was entered into an Excel spreadsheet in the order that they were received. The spreadsheet included child/parents name, children's child care, dates of assessment completion, the names of who assessed each child, and a random number was assigned. A website (random.org) was used to generate a random list of numbers to assign to the participants. This number was used as a name replacement on all forms to help keep the assessment information confidential. Child participants were also randomly assigned to hear the typical- or high-prosody story. This was done by alternately adding the number one (typical-prosody) or two (high-prosody) to the list of participants. Assigning researchers to assess children was based upon the researcher's availability and schedule.

Assessments occurred over a two-day period at the child care centers. The approved script (see Appendix E) was used in talking to and assessing the child on both days. On day one, an assigned researcher individually administered the PPVT to all child participants. Eighty two (98%) of the child participants completed the Peabody Picture Vocabulary Test. Two children were not assessed due to their attendance at the center not being congruent with an assessor's schedule. Another child refused to participate.

On day two, children watched their assigned version of *Russell the Sheep* while being video recorded. Assessors followed the script (see Appendix E) as they met and assessed each child. The child was instructed to sit on a chair that was centered in front of a computer screen, approximately two feet away. The interviewer then started the video recording. The researcher had the child follow the researcher's finger around the outside of the screen with their eyes to understand the child's eye gaze. Each child was then shown a hard copy of the book and asked if they have heard the book before. If they were familiar with the book, the child watched the presentation of the book but no information was gathered and the child was not included as a participant in the study. If they had not heard the story, the interviewer said, "I would like you to watch this story on the computer and then we will talk about it afterwards. I am going to step outside of the room but I will come back after the story is over." The interviewer started the recording of the story and left the room.

After the story was over, the interviewer entered the room and asked the cognitive and emotional engagement questions (see Appendix B). Children were randomly assigned to receive the cognitive or emotional questions first. Children were also video-recorded during the interview and their responses were recorded on the provided form (see Appendix B). Researchers then took the children back to their classroom.

Researchers entered the data into two separate SPSS files as data were being gathered. Data means were computed and compared between files to check that data were entered correctly; data were checked and reentered as needed. Two separate researchers watched each video and rated it for behavioral-eye and behavioral-body engagement.

Videos were watched in 30-second intervals, coded, and entered into SPSS by researchers. Final video rating scores were then compared. Cohen's κ was calculated to determine if researchers agreed on children's behavior eye and body engagement. Results indicated a fair agreement between researchers on the behavior eye engagement, $\kappa = .30$, $p < .001$. Behavior eye engagement video ratings had an average disagreement of $M = .21$ ($SD = .24$) and ranged from 0-1.17 points. Researchers had 100% agreement on 38% of the ratings. Agreement between raters on the behavior body engagement indicated poor agreement, $\kappa = .19$, $p < .001$. Behavior body engagement video ratings had an average disagreement of $M = .30$ ($SD = .31$) and ranged from 0-1.20. Researchers had 100% agreement on 30% of the ratings. If there was not an agreement on the video, two researchers watched the video together. An open discussion occurred and ratings were discussed until an agreement of scores occurred.

CHAPTER IV

RESULTS

Analyses

This study used a quasi-experimental design. Research questions 1, 2, 3, and 4 were answered using quantitative data collected through assessments, interviews, and questionnaires.

Descriptive statics were calculated to understand the typical- and high-prosody groups. A chi-square test was performed to examine differences based on gender. Average PPVT standard scores were then calculated. Independent-sample *t* tests were then used to assess if there were differences between the typical- and high-prosody groups based on PPVT standard scores.

Analysis for question one (Do children's emotional, cognitive, behavioral-eye, and behavioral-body engagement differ between typical- and high-prosody book readings) used independent *t* tests to assess if there were significant differences between the typical- and high-prosody groups and each type of engagement. To answer question two (Are there significant associations among the emotional, cognitive, behavioral-eye, and behavioral-body aspects of engagement?) a Pearson correlation was used to measure the strength of association between the engagement scales.

For questions three (Does children's receptive vocabulary moderate the associations between typical-versus high-prosody book readings and children's emotional, cognitive, behavioral-eye, and behavioral-body engagement?), and four (Do

aspects of children's home literacy environment moderate the association between preschool children's emotional, cognitive, behavioral-eye, and behavioral-body engagement and typical- or high-prosody book readings?) a multiple regression analysis was computed based on the procedures suggested by Aiken and West (1991) and Hayes (2013). A multiple regression analysis allows one to predict values of a dependent variable (i.e., emotional, cognitive, behavioral-eye, and behavioral-body engagements) from multiple independent variables (i.e., receptive vocabulary and aspects of the home literacy environment). All variables were standardized to make interpretations simpler and to avoid multicollinearity. A regression model was created that predicted both the type of engagement from the predictor variable and the moderator variable. The effects as well as the model were examined for significance. If significance occurred, a second model was then created by adding the interaction effect to the previous model and this second model was then examined for significance and if the change from model one to model two (change in R^2) was significant. If the interaction term was statistically significant then moderation occurred, indicating that the strength of the association between independent and dependent variables statistically significantly changed. Statistically significant interaction effects were followed up with a simple slope analysis to understand the relationship between high, medium (grand mean), and low levels of the moderating variable.

Descriptive Statistics

Child participants attended two on-campus child care centers (known hereafter as

Center One and Center Two) and two off-campus child care centers (known here after as Center Three and Center Four). Center One serves a maximum of 104 children, birth to five-years-old. Morning and afternoon preschool classes for children three to five years old are offered that last two and a half hours. Center Two serves a maximum of 85 children, 6 weeks to 6 years old, and offers after school programs for kindergarten children and a summer day camp for elementary-aged children. All child care is provided with learning experiences offered throughout the day. Centers Three and Four serve a maximum of 136 and 173 children, age birth to five years old, respectively. Both offer all day programs with learning experiences offered throughout the day.

Families were primarily Caucasian (58, 78.3%) followed by other (11, 14.9%), Asian/Pacific Islander (2, 2.7%), and African American/Black, American Indian/Alaskan, and Latino (1, 1.4% each). Most families earned $60,000+ (40, 55.6%) followed by $45,000-59,999 (13, 18.1%), $30,000-44,999 (9, 12.5%), $15,000-29,999 (6, 8.33%), $10,000-14,999 (2, 2.8%), and $5,000-9,999 and less than $4,999 (1, 1.4% each). The majority of children lived with married parents (61, 84.4%) followed by divorced (4, 5.4%), separated (3, 4.0%), committed relationship (3, 4.0%), other (2, 2.7%), and widowed (1, 1.4%).

Descriptive statistics were calculated to understand the typical- and high-prosody story groups. The typical-prosody group consisted of 21 boys and 14 girls. They ranged in age from 40 to 63 months (M = 53.17, SD = 6.40). Their PPVT standard scores ranged from 91 to 134 (M = 112, SD = 12.2). The high-prosody group consisted of 20 boys and 21 girls. Their ages ranged from 36 to 67 months (M = 53.61, SD = 7.74) and their PPVT

scores ranged from 77 to 146 (M = 114.17, SD = 14.24). Seventy six (90%) of the child participants completed the engagement measures. Two boys and one girl refused to participate. One boy appeared to know the story which led to him watching the story but not responding to the engagement measures. One boy left on family vacation and did not return in time to complete the assessments. Two boys were also not assessed due to their attendance at the center not being congruent with an assessor's schedule. One three-year-old boy had to stop taking the assessment because he was hitting the computer while watching the video and would not stop after being asked to do so. In total, 66 (79%) parent-child participants completed all the assessments (the parent survey, PPVT, and cognitive, emotional, and behavioral-eye and behavioral-body engagement measures).

Typical- and high-prosody groups were then compared to determine if there were statistically significant differences between the groups based on gender, age, and PPVT scores. A chi-square test was performed to examine differences based on gender. No statistically significant association was found, $\chi^2(1) = .96$, $p = .36$. Independent-samples t tests indicated that there were not significant differences between the typical- and high-prosody groups based on age ($t(74) = .27$, $p = .79$ or PPVT standard scores $t(74) = -.71$, $p = .48$.

Question 1: Do Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Engagement Differ Between Typical- and High-prosody Book Readings?

Independent-sample t tests were calculated to determine if there were differences in children's emotional, cognitive, behavioral-eye, and behavioral-body engagement

between typical- and high-prosody book readings. Results showed that there were no statistically significant difference between typical- and high-prosody groups for each of the four types of engagement (see Table 2). Children who listened to the typical prosody story were similarly engaged emotionally, cognitively, and behaviorally engaged as children who heard the high-prosody story.

Table 2

Mean Scores, Standard Deviations, and Scores for Prosody and Engagement Group Type

Engagement type	Prosody type	*n*	*M (SD)*
Emotional	Typical	35	7.90 (1.74)
	High	41	7.66 (2.40)
Cognitive	Typical	35	2.27 (1.50)
	High	41	2.42 (1.86)
Behavioral-eye	Typical	35	4.34 (.52)
	High	41	4.50 (.55)
Behavioral-body	Typical	35	4.27 (.70)
	High	41	4.38 (.65)

Note. All variances are equal. There were no significant differences between means on engagement type.

Question 2: Are There Significant Associations Among the Emotional, Cognitive, Behavioral-eye, and Behavioral-body Aspects of Engagement?

Pearson correlations were used to measure the strength of association among the emotional, cognitive, behavioral-eye, and behavioral-body scales. Three statistically significant relationships between the engagement scales were found. The cognitive engagement scale had a positive relationship with the behavioral-eye engagement scale $r(74) = .44$, $p < .01$ and the behavioral-body scale $r(74) = .30$, $p < .01$. The behavioral-eye engagement scale had a strong positive relationship with the behavioral-body scale, $r(74) = .72$, $p < .01$ (see Table 3). As children were more cognitively engaged they were more likely to be engaged on behavioral-eye (looking at the book) and behavioral-body (sitting still) measures. Behavioral-eye and behavioral-body engagement were also significantly correlated.

Question 3: Does Children's Receptive Vocabulary Moderate the Associations Between Typical- Versus High-prosody Book Readings and Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Engagement?

Multiple regression models were calculated to examine whether the association between prosody and the type of engagement (emotional, cognitive, behavioral-eye, behavioral-body) was moderated by children's receptive vocabulary, as measured by the PPVT. To determine this, two regression models were calculated for each type of engagement. In model one prosody and PPVT were entered as independent variables and

Table 3

Correlations Between Engagement Scales

	Emotional scale	Cognitive scale	Behavioral-eye scale
Emotional scale			
Cognitive scale	0.13		
Behavioral-eye scale	0.14	0.44**	
Behavioral-body scale	-0.12	0.30**	0.72**

Note. Sample size = 76. **p = 0.01.

type of engagement as the dependent variable. In model two the interaction of prosody and PPVT was added to model one. All variables were standardized as *z*-scores.

Emotional Engagement

Model one for emotional engagement was not statistically significant, $F(2, 73) = 1.29$, $p = .28$, indicating that children's PPVT score did not moderate the relationship between story prosody and emotional engagement – hence model two was not calculated (see Table 4).

Cognitive Engagement

For the model predicting cognitive engagement (model one, $F(2, 73) = 10.79$, $p < .001$), PPVT statistically significantly predicted cognitive engagement $\beta = .48$, $p < .01$ but prosody was not significant. The interaction term was then added to this model (model two) but neither the interaction term nor prosody were significant. PPVT was statistically significant in predicting cognitive engagement $\beta = .46$, $p < .001$. Children's

PPVT score did not moderate the relationship between story prosody and cognitive engagement.

Behavioral-eye Engagement

In model one for behavioral-eye engagement $F(2, 73) = 4.75$, $p = .01$, PPVT was statistically significant $\beta = .30$, $p < .01$, however prosody was not. In model two the interaction term was added $F(3, 72) = 3.17$, $p = .03$, but only PPVT was significant in model two in predicting behavioral-eye engagement $\beta = .30$, $p < .01$. Children's PPVT scores did not moderate the association between story prosody and behavioral-eye engagement.

Behavioral-body Engagement

In model one for behavioral-body engagement neither prosody or PPVT proved statistically significant, $F(2, 73) = 1.26$, $p = .29$, indicating that children's PPVT scores did not moderate the relationship between story prosody and behavioral-body engagement.

Question 4: Do Aspects of Children's Home Literacy Environment Moderate the Association Between Preschool Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Aspects Engagement During Typical- or High-prosody Book Reading?

Two variables were selected from the home environment literacy survey to understand their moderating effects between prosody and engagement: (1) The number of

Table 4

Regression Analysis for PPVT Moderating the Association Between Story Prosody and Each Type of Engagement (N = 75)

	Emotion			Cognitive			Behavioral-eye			Behavioral-body		
Variable	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Model 1												
Constant	-.01	.12		.04	.10		-.02	.11		-.01	.12	
Prosody	-.07	.12	-.07	.01	.10	.01	.134	.11	.13	.07	.12	.07
PPVT	.19	.13	.18	.52	.11	.48***	.326	.12	.30**	.18	.13	.16
Model 2												
Constant	-.03	.11		-.05	.10		-.02	.11		-.01	.12	
Prosody	-.08	.11	-.08	.00	.10	.00	.14	.11	.14	.07	.12	.07
PPVT	.15	.12	.14	.50	.11	.46***	.33	.12	.31**	.19	.13	.18
Interaction	.24	.13	.22	.13	.12	.12	-.04	.12	.12	-.08	.13	.07

**$p < .01$, ***$p < .001$

minutes children are read to daily, and (2) the number of hours children spend watching TV weekly. As in question three above, multiple regression models for type of engagement (emotional, cognitive, behavioral-eye, behavioral-body) were calculated to examine whether prosody was moderated by: (1) The number of minutes children are read to daily, or (2) the number of hours children spend watching TV each week. All variables were standardized as *z*-scores.

Emotional Engagement and Number of Minutes Children are Read to Daily

To test if *minutes* moderated prosody for emotional engagement, (model one, $F(2, 62) = 2.73$, $p = .07$), prosody was not statistically significant but *minutes* significantly predicted emotional engagement, $\beta = .25$, $p < .05$ (see Table 5). In model two in which the interaction term of prosody by *minutes* was added to the model, both the interaction term and *minutes* proved significant: $F(3, 61) = 4.47$, $p = .007$, indicating that the amount of time children are read to at home may moderate the association between prosody and emotional engagement. Simple slope analysis indicated that when minutes read at home are low (one standard deviation below the mean), there is a significant negative relationship between prosody and emotional engagement, $b = -.95$, 95% CI (-1.78, -.12), $t = -2.39$, $p = .02$). At the mean level of minutes read at home, there is a non-significant negative relationship between prosody and emotional engagement, $b = -.30$, 95% CI (-80, .20), $t = -1.21$, $p = .23$. When there is a high amount of minutes read at home (one standard deviation above the mean), there is a non-significant positive relationship

Table 5

Regression Analysis for Minutes Moderating the Association Between Story Prosody and Each Type of Engagement (N = 64)

	Emotion			Cognitive			Behavioral-eye			Behavioral-body		
Variable	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Model 1												
Constant	-.00	.12		.08	.12		.01	.13		-.00	.13	
Prosody	.24	.12	.25*	.37	.11	.39***	.05	.12	.05	.04	.12	.04
PPVT	-.15	.13	-.15	.01	.12	.01	.05	.13	.05	.01	.13	.01
Model 2												
Constant	-.02	.12		.08	.11		.01	.13		-.00	.13	
Prosody	.24	.11	.25*	.37	.11	.39***	.05	.12	.05	.04	.12	.04
PPVT	-.16	.12	-.15	.01	.12	.01	.05	.13	.05	.01	.13	.01
Interaction	.31	.12	.32**	.14	.11	.15	.08	.12	.08	.00	.13	.00

*$p < .05$. **$p < .01$. ***$p < .001$.

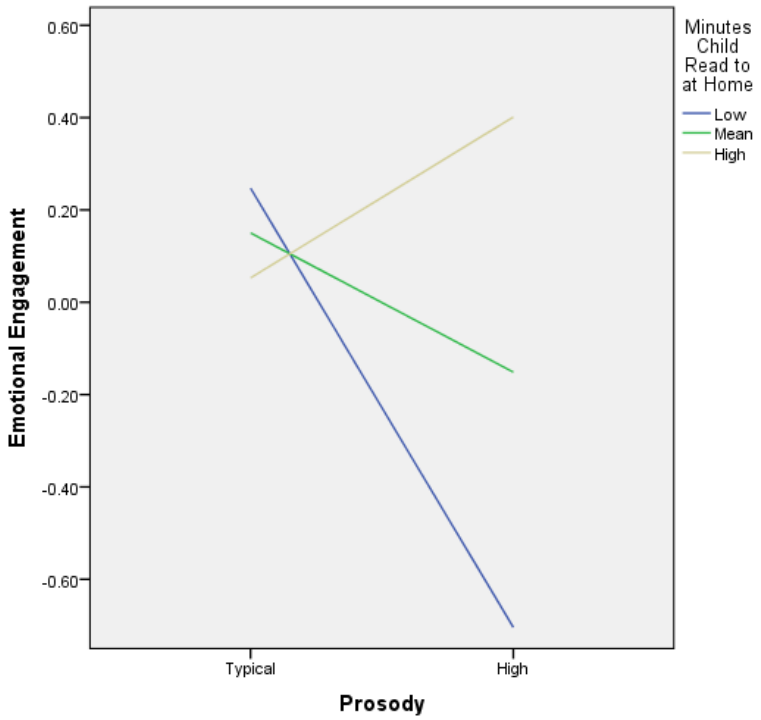


Figure 3. The relationship between prosody and emotional engagement with the variable "minutes child read to daily" as a moderator.

between prosody and emotional engagement $b = .35$, 95% CI (-.33, 1.02), $t = 1.03$, $p = .30$ (see Figure 3).

Cognitive Engagement and Number of Minutes Children are Read to Daily

In model one for cognitive engagement $F(2, 62) = 5.60$, $p = .006$, *minutes* was statistically significant $\beta = .39$, $p = .001$ but prosody was not. The interaction term (minutes by prosody) was then added to model one to create cognitive engagement model two $F(3, 61) = 4.33$, $p = .008$. *Minutes* was again significant $\beta = .39$, $p = .001$ in model

two but neither the interaction nor prosody were significant; minutes children were read to did not moderate the relationship between story prosody and cognitive engagement.

Behavioral-eye Engagement and Number of Minutes Children are Read to Daily

In model one for behavioral-eye engagement neither *minutes* nor prosody proved statistically significant $F(2, 62) = .18$, $p = .84$; minutes children were read to did not moderate the association between story prosody and behavioral-eye engagement.

Behavioral-body Engagement and Number of Minutes Children are Read to Daily

In model one for behavioral-body engagement neither *minutes* nor prosody proved statistically significant $F(2, 62) = .05$, $p = .95$; minutes children were read to did not moderate the relationship between story prosody and behavioral-body engagement.

To summarize, the *minutes* children were read to daily, as measured by a parent survey, did moderate the association between prosody and emotional engagement. Simple slope analysis found that when minutes read at home are low, there is a significant negative relationship between prosody and emotional engagement; as prosody increased, emotional engagement decreased. On the other hand, the minutes children were read to daily did not moderate the association between prosody, cognitive, behavioral-eye engagement, or behavioral-eye engagement.

Emotional Engagement and the Number of Hours Children Spend Watching TV each Week

Next, the time children spent watching TV was examined as a moderating

variable between the level of prosody and each type of engagement. In model one for emotional engagement neither TV hours or prosody were statistically significant $F(2, 62) = .64$, $p = .53$, indicating that the time children spent watching TV did not moderate the relationship between story prosody and emotional engagement (see Table 6).

Cognitive Engagement and the Number of Hours Children Spend Watching TV each Week

In model one for cognitive engagement TV hours were statistically significant ($\beta = -.37$, $p < .01$), but prosody was not $F(2, 62) = 4.93$, $p = .01$. In model two, TV hours were also significant $\beta = -.38$, $p < .01$, however prosody and the interaction were not $F(3, 61) = 3.92$, $p = .01$.

Behavioral-eye and Behavioral-body Engagements and the Number of Hours Children Spend Watching TV each Week

In model one for behavioral-eye engagement and behavioral-body engagement neither TV hours or prosody were significant predictors $F(2, 62) = 1.87$, $p = .16$; $F(2, 62) = .35$, $p = .71$, indicating that the time children spent watching television did not moderate the relationship between story prosody and behavioral-eye or behavioral-body engagement. The time children spent watching television, as measured by a parent survey, did not moderate the association between prosody and any type of engagement.

Table 6

*Regression Analysis for TV Time Moderating the Association Between Story Prosody and Each Type of Engagement (*N = *64*)

	Emotion			Cognitive			Behavioral-eye			Behavioral-body		
Variable	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Model 1												
Constant	.01	.13		.11	.12		.03	.12		-.00	.13	
TV hours	-.05	.13	-.05	-.36	.11	-.37**	-.22	.12	-.23	-.01	.12	-.10
Prosody	-1.4	.13	-.13	.02	.12	.02	.06	.12	.06	.03	.13	.03
Model 2												
Constant	.01	.13		.11	.12		-.03	.12		-.00	.13	
TV hours	-.06	.13	-.06	-.37	.11	-.38**	.22	.12	-.23	-.11	.12	-.11
Prosody	-.13	.13	-.13	.02	.12	.02	.06	.12	.06	.04	.13	.04
Interaction	-.13	.13	-.13	-.15	.11	-.16	.02	.12	.02	-.13	.13	-.13

**$p < .01$.

Summary of Findings

Research question one was addressed by testing the differences between children's behavioral-eye, behavioral-body, cognitive, and/or emotional engagement in high- versus typical-prosody book readings. Independent *t* tests showed that there was not a statistically significant difference between typical- and high-prosody and each type of engagement.

Research question two was addressed by the correlations between pairs of the emotional, cognitive, behavioral-eye, and behavioral-body engagement scales. A statistically significant, positive Pearson correlation was found between the cognitive and the behavioral-eye scales, cognitive and the behavioral-body scales, and behavioral-eye and behavioral-body scales.

Research question three addressed if children's receptive vocabulary (as measured by the PPVT) moderated the association between typical- or high-prosody book readings and engagement types. Receptive vocabulary was not a statistically significant moderator in any of the engagement models.

Research question four addressed how two home environment variables moderated the association between story prosody and engagement: (1) The number of minutes children are read to daily, and (2) the number of hours of television children watched each week. The emotional engagement model showed that the number of minutes children were read to did moderate the association between prosody and emotional engagement. Simple slope analysis showed that when minutes read at home are low, there is a significant negative relationship between prosody and emotional

engagement; as prosody increased, emotional engagement decreased. The cognitive, behavioral eye, and behavioral body engagement models were not moderated by the amount of time children were read to. Hours of television also did not moderate the association between the level of prosody and any type of engagement.

CHAPTER V

DISCUSSION

The following sections discuss the results of this study in relation to current research on reading to children. The limitations, implications, and directions for future research are also discussed.

The purpose of this study was to (1) broaden our understanding of child engagement during book reading to include behavioral-eye and behavioral-body, cognitive, and emotional engagement; (2) address how different levels of prosody (high and typical) affect engagement for preschool-aged children; (3) understand the extent that children's receptive vocabulary moderates the effect of prosody on engagement; and (4) understand the influence of the home literacy environment on children's engagement while listening to book reading. A quasi-experiment was designed to examine these issues. Children and parents from four local child-care centers were asked to participate. Children were randomly assigned to watch a typical- or high-prosody version of a story that was presented on a computer. Children's receptive vocabulary was also measured and parents completed a survey concerning the home literacy environment. The four sections that follow address the findings associated with each research question.

Research Question 1: Do Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Engagement Differ Between Typical- and High-prosody Book Readings?

Children's emotional, cognitive, behavioral-eye, and behavioral-body engagement

did not differ between the typical- and high-prosody groups. This is in contrast to previous research (Mira & Schwanenflugal, 2013; Moschovaki et al., 2007) that indicated prosody influenced engagement in reading. A significant difference between the current and past research is that in the current research the story was presented by computer rather than with an adult reading out loud in the room. Mira and Schwanenflugal (2013) had an adult turn the pages of a book while each child listened to a typical- or high-prosody version of a book. Moschovaki et al. (2007) recorded teachers reading to a group of children. In both cases, children were more engaged during high-prosody than with typical-prosody stories. Adult body language and facial expressions used during shared reading may act as a referencing point to help children understand what is happening in a story (Nelson & Russell, 2010). The influence of an adult directly reading to children combined with high prosody may have more significant effects on engagement than prosody alone.

Pianta (2006) describes the relationship between children and adults as the primary medium that influences literacy development. Secure adult-child relationships facilitate literacy-related activities and interactions such as listening to and telling stories, engaging in conversations, and participating in and attending to shared reading. When children experience security, these activities are more cooperative, responsive, and enjoyable, leading to a transmission of literacy related information. Howes et al. (2008) found that the relationship between the teacher and child influenced emergent literacy skills such as oral language and letter sound above classroom characteristics (i.e., ratio, teacher qualifications, and program location and length). Taken together, these findings

speak to the importance of the adult caregiver in young children's acquisition of literacy skills.

The presentation of the story on a computer took away the presence of an adult reader; the use of a computer could have influenced the children's engagement in the typical-prosody story enough that there was not a statistically significant difference between their engagement and the children in the high prosody group. It has been found that found that e-books engaged children more than a teacher reading and led to children's greater print awareness, vocabulary, alphabetic knowledge, and phonological awareness. It was hypothesized that e-books may facilitate better learning when compared to an adult reading to a child (Ihmeideh, 2014). Similar to the present research, the e-book presents digital text and pictures to a child where they have a more personal up-close experience with the story. Despite children's general exposure to computers (Child Trends, 2012; Common Sense Media, 2013), the use of a computer in this study could have also created a novelty effect. Similar to previous research (Ihmeideh), the children in this study may have lacked computer exposure. The presentation of the book on a computer in this research could have created a novelty effect. Vygotsky's (1978) theory may give further understanding to the results of this research question. The computer acts as a tool to help children focus their attention and scaffold their learning. It gains the child's attention and interest, allowing him or her to focus on the story rather than other tasks. Due to the novelty effect, the children's attention to the story may have been influenced more by the computer than the typical- or high-prosody used in the stories.

Prosody may not have affected engagement due to children's focus on interpreting the content of the story rather than how the story was read. Perhaps preschool-aged children are more likely to focus on the meaning of the words rather than how the words are said (Morton & Trehub, 2001). In this research, the children may have focused more on understanding the story's content and were not as influenced by the prosodic elements.

Research Question 2: Are There Significant Associations Among the Emotional, Cognitive, Behavioral-eye, and Behavioral-body Aspects of Engagement?

This research adds to previous research by separating the engagement construct into four separate constructs: emotional, cognitive, behavioral-eye, and behavioral-body. In most research to date, engagement is viewed as a single construct. Only behavioral (Evans & Saint-Aubin, 2013; Mira & Schwanenflugel, 2013; vanderMaas-Peeler, Nelson, Bumpass, & Sassine, 2009), cognitive (Kim et al., 2011; Lynch, 2011; Pearman, 2008), or emotion-related indicators of engagement are typically used in studies, but not all three together (Baroody & Diamond, 2012; Martini & Sénéchal, 2012). The current research confirmed that the different types of engagement do not occur in isolation from each other. Cognitive engagement was related to behavioral-eye and behavioral-body engagement. Children whose body were more at rest and who were looking at the book also remembered more about the story. Further, there was also an association between behavioral-eye and behavioral-body engagement. Children who were looking at the book were also more likely to be sitting attentively.

Knowing this can help parents and teachers gain an understanding of what children are learning during the shared reading process. In this study, the researcher sought to understand the child's cognitive engagement after the book was read. If a teacher or parent knows the associations between cognitive, behavioral-eye, and behavioral-body engagement, he or she can get an idea the child is learning during the process of reading. Children who do not appear to be bored (i.e., sitting still and upright as opposed to slouched and fidgety; looking at the book) are more likely to be cognitively engaged. Conversely, a child who does appear to be bored may not be learning as much from the story. The parent or teacher can redirect the child's attention to the story by asking questions or doing an activity related to the story. Some parents or teachers may believe that children who are not too fidgety and/or may not be looking at the book and are just listening are still learning from the story. The results of this research suggest that this may not be the case. Children who do not show behavioral-eye and body-engagement may learn less from the story. Because directionality cannot be stated, it is also possible that children who are cognitively engaged are more likely to sit still, have upright posture, and be looking at the book while being read to.

Research Question 3: Does Children's Receptive Vocabulary Moderate the Associations Between High- Versus Typical-prosody Book Readings and Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Engagement?

Receptive vocabulary, as measured by the PPVT, was examined as a moderator between typical- and high-prosody stories and each type of engagement. None of the four

engagement models showed receptive vocabulary statistically significantly moderating the relationship between prosody and emotional, cognitive, behavioral-eye, and behavioral-body engagements. High receptive vocabulary scores could have influenced children's engagement. In the sample of participants in this study, children's mean receptive vocabulary scores were almost one standard deviation above average. Children in the typical-prosody group averaged 112 points while children in the high prosody group averaged 114 points; one standard deviation above the mean is 115. Preschool-aged children's high receptive vocabulary is associated with better reading comprehension (Silva & Cain, 2015). The average high receptive vocabulary could be why no difference was found between the typical- and high-prosody groups in any type of engagement. The findings of this research suggest that once children meet a minimum level of receptive vocabulary, higher receptive vocabulary is not as influential. It also could simply be the case that once children's receptive vocabulary reaches an adequate level, children will be interested in book reading whether it is done with typical prosody or high prosody. In a sense, this finding should be reassuring to parents who can muster the exuberance for typical prosody, but nothing beyond. These findings also suggest that given an engaging book, parents can read with typical or high prosody with similar results.

Research Question 4: Do Aspects of Children's Home Literacy Environment Moderate the Association Between Preschool Children's Emotional, Cognitive, Behavioral-eye, and Behavioral-body Engagement and Typical- or High-prosody Book Readings?

The association between the level of prosody and emotional engagement was statistically significantly moderated by the number of minutes children are read to daily at home. Further analysis found that only children who were read to less were more emotionally engaged when they heard a story with typical prosody rather than high prosody. This association may be explained by the difference in the standard reading style parents use at home. Parents who do not enjoy reading books may read to their children less often and with less expression; their reading might be more robotic in nature. This low prosody reading may create a standard for the children that they become used to. When children who are read to less often hear a story with high prosody, they are less likely to be emotionally engaged because it goes against their typical experience. They may find the dramatic elements of a story read with high prosody distracting from paying attention to the story line.

Vygotsky's (1978) theory may give further insights to the results of this research question. Reading with high prosody could be considered a tool that parents and teachers use to engage children during shared reading. Tools extend people's mental capacities. Parents who read often to their children may be more likely to use this tool to engage their children; these children start to understand this tool and are more emotionally engaged. Only 34% of parents in the sample read the recommended 20 or more minutes a

day to their children. Parents who read less often may be less likely to use this tool with their children. When these children are exposed to the high prosody tool, they may find the parents' voice distracting, are not able to scaffold the story as well, and are less likely to enjoy the story.

The number of minutes children were read to daily did not moderate the relationship between prosody and cognitive, behavioral-eye, and behavioral-body engagement. Prosody may be considered a tool that helps children focus their attention on a story (Lawson, 2012). However, this tool may be operating outside of a preschool child's Zone of Proximal Development. As previously discussed, children are more likely to focus on understanding the words in a story rather than the emphasis placed on them due to how they are said (Morton & Trehub, 2001). Prosody may be a tool to help children focus their attention but for preschoolers it may be operating out of their Zone of Proximal Development. As children further develop, prosody may be more useful for older children.

The number of hours children spend watching TV weekly also did not moderate the relationship between prosody and each type of engagement. Parents reported that children watched an average of 11 hours of television a week, or 1.57 hours a day. This is far below the national average of 25 hours per week, or 3.57 hours per day (McDonough, 2009). It also falls within the range of the American Academy of Pediatrics' recommendation that preschool-aged children should be limited to 1-2 hours television per day. Children in this study may not watch enough television to make a significant difference in the relationship between prosody and each type of engagement.

Limitations

This study had a number of limitations. First, the typical- and high-prosody stories may not have actually been so. A clear definition of typical- and high-prosody is not available in the literature and an attempt was made in this study to define these terms. The typical- and high-prosody book readings may not have had the right amounts of intensity and pitch to accurately influence the children's engagement. Further, the difference between typical- and high-prosody readings may not have been different enough from each other, despite attempts to increase the contrast between the two conditions. The typical-prosody reading could have been made more robotic in nature while the high-prosody reading could have been made more expressive.

In the current study not all elements of prosody were accounted for. Prosody includes changes in (a) pitch, (b) intensity, also described as stress or loudness, (c) duration of spoken words, and (d) pauses within and between sentences. This study only examined pitch and intensity. A better understanding and application of duration and pauses in this study could have engaged the children differently than only focusing on pitch and intensity.

Second, the book that was selected for this research, *Russell the Sheep*, may not have been suited to appropriately represent high prosody and engage the children. An effort was made to find a book that met these criteria; however, other books may have been better suited. A book with more characters, character voices, and dramatic events may better lend itself to the use of high prosody. The length of the story may also have

affected the children's engagement. The book could have been longer, allowing more time for children to become invested in the characters and plot. A fundamental developmentally appropriate practice is to read books to children that relate to their interests (Copple & Bredekamp 2009). It was determined that *Russell the Sheep* fit this requirement enough to use for all children in this study. However, on an individual level the book may not have been related enough to their interests for them to become highly engaged.

Third, measurement error could have affected the engagement measures. An effort was made to precisely measure eye movements. The behavioral-eye and behavioral-body engagement measures are similar to previous research measuring visual attention in infants and preschool-aged children (Evans et al., 2008; Fantz, 1961; Frick & Colombo, 1996; Kwon et al., 2016; Mayer & Dobson, 1982). A comparison video was also made that allowed the researcher to know when the child was looking outside of the computer screen while watching the story presentation. When the child's eyes went to or past the point of the outside of the screen, the researcher knew that the child's eyes were no longer looking at the story. As researchers were coding the video for behavioral-eye and behavioral-body engagement, the comparison videos were used to understand when the child was not looking at the screen. While this is one way of understanding gazing behavior, more precise measures of eye movements are available. Evans and Saint-Aubin (2013) used the Eyelink II system to measure if children's eye movements are related to vocabulary acquisition after repeated readings of books. This system consists of three miniature cameras mounted on a padded headband that a child would wear while

watching a book presented on a computer. Verhallen and Bus (2011) used the Tobii 1750 remote eye-tracker to understand how five-year-old children used illustrations in storybooks to understand a story. This system consists of a computer with a camera mounted on top. Eye-gaze is determined by registering the reflection of infra-red lights on the cornea with a high-resolution camera and measuring the relative positions of the center of the pupil. A grant was written to purchase hardware that would allow these more precise measures, but it was not awarded.

Measurement error could have also affected the cognitive and emotional engagement measures. These measures were based off Mira and Schwanenflugel (2013), and Levy (2009), respectively. No psychometric data were provided by the authors. O'Toole (2015) used similar techniques as Mira and Schwanenflugel (2013) but did not conduct a psychometric analysis. No psychometric data was provided by Levy (2009) for the emotional scale, however, using facial expression scales is an accepted practice when assessing children (Wortham, 2012).

Fourth, the participation rate and sample demographics could have influenced the results. Out of approximately 280 consent forms that were distributed to parents at four childcare centers, 87 were returned. Of these, 74 were able to participate; this amounts to a 26% response rate. This led to a sample that was not representative of the population. Most of the sampled families (56%) earned $60,000 or more a year compared to the national average income of $53,657 (United States Census Bureau, 2014). Sixty-one percent of children had married parents compared to 46% in the population (Livingston, 2014). In the current study 64% of mothers and 56% of fathers had college degrees while

data from the United States Census Bureau indicates that 29% of persons 25 years and older have a bachelor's degree (United States Census Bureau, 2016). Thirty-eight percent of children had a receptive vocabulary more than one standard deviation above average. The sample also differed from the population by the amount of time children are read to daily. Fifty-eight percent of parents in this study reported reading 15 or more minutes daily to children. Among 2,061state-funded prekindergarten programs, it was found that teachers spent about 14 minutes a day reading to children (Early et al., 2010). Further, slightly less than half of birth to five-year-old children experience shared reading every day (Russ et al., 2007). Higher income families, married parents, college educated parents, children with higher receptive vocabulary, and children who are read to more often are indicative of children who are more privileged than the average child in the United States. The implications of a low response rate and a nonrepresentative sample may have led to biased results and the inability to generalize the results to the population (Galea & Tracy, 2007).

Implications

This study provides a unique contribution to the early literacy research by broadening the engagement construct to simultaneously include emotional, cognitive, and behavioral indicators of engagement. To understand the impact of reading to children, researchers have to break away from the single engagement construct as other researchers have called for (Fredricks et al., 2004). Doing so will give a more complete understanding of engagement. Otherwise, children may be sitting still but researchers will

not know if they are enjoying the book. Further, researchers may find children are happy during the book reading but it relates more to the teacher-child relationship rather than their cognitive engagement. Measuring all types of engagement simultaneously will allow a more complete picture of engagement. This understanding will also allow for a more targeted approach to helping children be engaged in all areas.

Results from research question four indicated that children who were read to less often at home were less emotionally engaged when they heard a story with high prosody than with typical prosody. This result supports previous research that found studying the combined effects of a child's home and preschool learning environment to understand children's development is more effective than studying the preschool environment alone (Melhuish et al., 2008). As researchers are understanding what influences children's development, they need to measure how the multiple environments in which children interact with (e.g., home and childcare) influence their development.

From a preschool teacher perspective, the results from research question four imply that in order to engage a child in reading in the classroom, it would be important to understand the child's literacy experiences at home. The effects of how often a child is read to at home may affect how engaged a child is in the classroom as the teacher reads with high prosody. Teachers would need to reach out to parents and discuss the home literacy environment. Understanding this would allow the teacher to effectively engage children in the classroom. If a parent is not reading to their child often, a teacher's high-prosody may lead to a child being less engaged then they would be otherwise.

Future Research

While there are several limitations of this study, the results provide insight for the continued study of how to appropriately engage children in reading. As the demand for preschool children to be prepared for kindergarten continues, researchers and policy makers must recognize and support what parents and teachers can do to engage children in reading. Results from this research suggest three areas of future study:

1. Understanding children's engagement in reading as a multifaceted construct, including emotional, cognitive, and behavioral-eye and behavioral-body measures.
2. Understanding the combined effects of multiple environments on children's development.

For parents, teachers, and researchers this means taking a whole-child approach to understanding what helps children be engaged in book reading across different environments. Teachers and parents need to communicate to each other and know what is happening in the childcare and home environments. By doing so, they will better understand the reading habits, interests, and abilities of their children and can adapt their environments to better suit their needs. Similarly, policy makers should promote research and programs that take a whole child approach to child literacy, linking children's home and child care environments together.

Conclusion

Engaging children in books should be an important topic for families, early care and education professionals, and policy makers. Researchers must continue to understand

the shared reading experience and what engages children in books in order for them to gain emergent literacy skills. To date, little research has understood the engagement construct from an emotional, cognitive, and behavioral perspective. This study provides a unique contribution as it simultaneously measured all three types of engagement while measuring the impact of prosody on children's engagement during reading. Findings from this research also support the need to understand how multiple environments combine to effect children's development.

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APPENDICES

Appendix A. Informed Consent

UtahState University
Department of Family Consumer & Human Development
2905 Old Main Hill
Logan UT 84322-2905
Telephone: (435) 797-1527

Page 1 of 3
USU IRB Approval: Oct. 23, 2014
Amend#1 Approved: 01/23/2015
Approval Terminates: 10/22/2015
Protocol #6092
IRB Password Protected per IRB Administrator

INFORMED CONSENT /PARENT PERMISSION

Prosody and Child Engagement during Story Time

Introduction/ Purpose Dr. Ann Austin and Trevor Rowe (PhD candidate) in the Department of Family, Consumer, and Human Development at Utah State University are conducting a research study to better understand the relationship between reading to a child with expression and the child's engagement in the story. You have been asked to take part because your child attends the Adele and Dale Young Child Development Laboratory. There will be approximately 30 participants at this site. There will be approximately 80 total participants in this research. This research project will help us further understand how children respond to book reading.

Funding There is no external funding for this study

Procedures If you agree to be in this research study, you will be given a home literacy survey to fill out and return to the preschool your child attends. Your child will participate in two assessments over a two-day period. The two assessments will last approximately 40 minutes total (20 minutes each day). All assessments will be conducted at your child's preschool. On day one your child will be administered the Peabody Picture Vocabulary Test to better understand their language. On day two your child will listen to and watch a children's story previously recorded and presented on a computer. Your child will be video recorded while watching the story so the researcher can better understand how children react to book reading events. The video recording will be saved onto a password protected external hard drive. After the story is over a researcher will ask your child questions about the story in order to gauge his/her reaction to and understanding of the story.

New Findings During the course of this research study, you will be informed of any significant new findings (either good or bad), changes in the procedures, risks or benefits resulting from participation in the research, or new alternatives to participation that might cause you to change your mind about continuing in the study. If necessary, your consent to continue participating in this study will be obtained again.

Risks Participation in this research study may involve some added risks or discomforts. There is a small risk of loss of confidentiality but we will take steps to reduce this risk including having a password protected external hard drive. All confidential information will also be stored in a locked filing cabinet in a locked office.

Benefits Your child's scores on the Peabody Picture Vocabulary Test will only be shared with you and no one else, so the direct benefit to you will be gaining an added understanding of your child's language. The information gained from this study may not have a direct benefit to you or your child at this time; however, researchers and educators may learn and better understand child literacy and design-improved programs to help children.

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Prosody and Child Engagement during Story Time

Explanation & offer to answer questions Trevor Rowe has explained this research study to you and answered your questions. If you have other questions or research-related problems, you may reach him at (208) 390-4612 or at trevor.rowe@aggiemail.usu.edu or you may contact Dr. Austin at Ann.Austin@usu.edu.

Payment/Compensation Your child will receive a children's book for their participation in this study. A book will be sent home with your child after the completion of all assessments.

Voluntary nature of participation and right to withdraw without consequence Participation in research is entirely voluntary. You and your child may refuse to participate or withdraw at any time without consequence or loss of benefits. You may be withdrawn from this study without your consent by the investigator if incomplete survey information is received.

Confidentiality Research records will be kept confidential, consistent with federal and state regulations. Only the investigator, co-investigator, and research assistants will have access to the data which will be kept in a locked file cabinet and on a password protected computer and external hard drive in a locked room to maintain confidentiality. To protect your privacy, personal, identifiable information will be removed from study documents and replaced with a study identifier. Identifying information will be stored separately from data and will be kept strictly confidential as described above. Identifying information will be stored for one year to complete further data analysis. Identifying information will then be destroyed in a way that it cannot be reconstructed; including the study identifier. Data will be presented in summary fashion only with no names attached.

IRB Approval Statement The Institutional Review Board for the protection of human participants at Utah State University has approved this research study. If you have any questions or concerns about your rights or a research-related injury and would like to contact someone other than the research team, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu to obtain information or to offer input.

Copy of consent You have been given two copies of this Informed Consent. Please sign both copies and keep one copy for your files.

Investigator Statement "I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered."

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INFORMED CONSENT /PARENT PERMISSION
Prosody and Child Engagement during Story Time

***Signature of Researcher(s)**

Trevor Rowe Principal Investigator 208.390.4612 trevor.rowe@aggiemail.usu.edu	Ann Austin Co-Principal Investigator Ann.Austin@usu.edu

Signature of Participant By signing below, I agree to participate and give permission for my child to participate.

Participant's signature	Date

Printed name

Relationship to child participant

Child's Name:_____

Child's Birth Date:_____

Appendix B. Cued Recall Questions and Answers

Plot Questions

1. What is the name of the sheep
    a. Russell
2. What did Russell do to help him fall asleep?
    a. Made it really dark by pulling his hat over his eyes
    b. Took off his wool
    c. Used a pillow (a frog)
    d. Tried sleeping in a trunk of a car
    e. Tried sleeping in the hollow of a tree
    f. Tried sleeping on a branch.
    g. Tried counting feet
    h. Tried counting the stars
    i. Tried counting sheep
3. How many sheep did Russell count?
    a. 10
4. What was the last thing that Russell counted?
    a. Himself

Inferential Questions

1. What were the other sheep doing while Russell was trying to sleep?
    a. sleeping
2. Why did Russell's hat go ziggy-zaggy?
    a. Because he had a brilliant idea

Appendix C. Reading Engagement Questionnaire and Observation Form

Reading Engagement Questionnaire and Observation Form

Child's Name:

Evaluator:

Story Prosody: ___ Typical ___ High

Cognitive Engagement: ___1st ___2nd

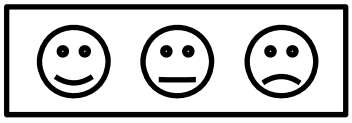
Emotional Engagement: ___1st ___2nd

(START VIDEO RECORDING)

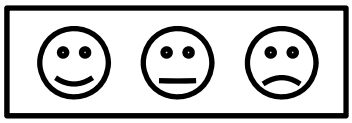
Emotional Engagement

Using the provided cards, introduce the emotional scale:

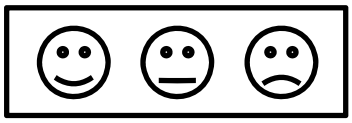
"What are some of the things you like very much? What does your face look like when you like _____"



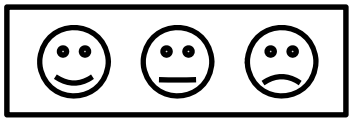
"What are some things you don't like? What does your face look like when you don't like _____"



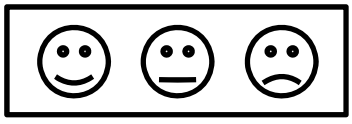
"What are some things you think are just okay? What does your face look like when you don't like _____"



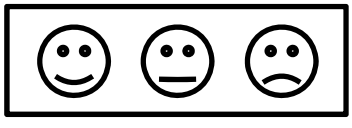
Say: "Let's pretend you walk to the ice cream store with your family to get your favorite flavor of ice cream. Do you like going to the ice cream store, not like it, or do you think it is just okay?"



"You're just about to eat your ice cream and someone bumps your shoulder. Your ice cream falls to the ground and you can't eat it. Do you like your ice cream falling on the ground, not like it, or do you think it is just okay?"

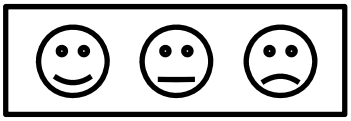


"Now you walk back home with your family after you went to the ice cream store. Do you like walking home with your family, think it is just okay, or do you not like it?"

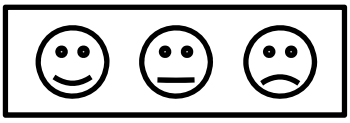


Feelings about the Story

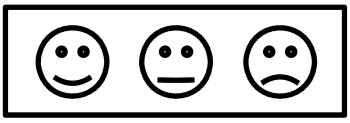
You just listened to a story on the computer. How much did like the story; did you like it, think it was okay, or did you not like it?



How much would you like to hear this story again some other time?



How much would like to have your mom or dad read this story to you?



How much would you like to tell this story to a friend?

Cognitive Engagement

Instructions: Ask the child the following questions; mark their answers accordingly.

Plot Questions

Child's Answer Correct (+/-)

1. What is the name of the sheep
    a. Russell _____ ___
2. Russell tried many things to help him fall asleep? Please name all the ones you remember. (You may elicit answers two more times by asking "What else do you remember?")
    a. Made it really dark by pulling his hat over his eyes

        _____ ___
    b. Took off his wool

        _____ ___
    c. Used a pillow (a frog)

        _____ ___
    d. Tried sleeping in a trunk of a car

        _____ ___
    e. Tried sleeping in the hollow of a tree

        _____ ___
    f. Tried sleeping on a branch.

        _____ ___
    g. Tried counting feet

        _____ ___

        Tried counting the stars

        _____ ___

        Tried counting sheep

        _____ ___
    h. Other

        _____ ___

3. How many sheep did Russell count?
    a. 10

_____ ___

4. What was the last thing that Russell counted?
    a. Himself

_____ ___

Inferential Questions

5. What were the other sheep doing while Russell was trying to sleep?
    a. Sleeping

_____ ___

6. Why did Russell's hat go ziggy-zaggy?
    b. He had a brilliant idea

_____ ___

Total Pluses:

_____

Behavioral-eye and behavioral-body Engagement Rating Scale

Instructions: Using the video recording of the child, rate the child's eye gaze and body posture every 10 seconds based on the following criteria:

Eye Gaze
1 = Not engaged; child is not looking at the screen.
2
3 = Sometimes engaged; child is looking at the screen at least half the time.
4
5 = Always engaged; child is looking at the screen the entire time

Body Posture
1 = Not engaged; child's body is slouched, may lay head on desk/table; child is fidgety
2
3 = Sometimes engaged; child's body is slouched; child appears fidgety at least half the time
4
5 = Always engaged; child is sitting still and upright

1. 00:00-00:30	**2. 00:31-1:00**	**3. 01:01-01:30**
Eyes:	Eyes:	Eyes:
□ 1	□ 1	□ 1
□ 2	□ 2	□ 2
□ 3	□ 3	□ 3
□ 4	□ 4	□ 4
□ 5	□ 5	□ 5
Body:	Body:	Body:
□ 1	□ 1	□ 1
□ 2	□ 2	□ 2
□ 3	□ 3	□ 3
□ 4	□ 4	□ 4
□ 5	□ 5	□ 5

4. 01:31-02:00

Eyes:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

Body:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

5. 02:01-02:30

Eyes:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

Body:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

6. 02:31-3:00

Eyes:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

Body:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

7. 03:01-03:30

Eyes:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

Body:
- □ 1
- □ 2
- □ 3
- □ 4
- □ 5

Total

Eye ___

Body ___

Average:

Eye ___

Body ___

Appendix D. Demographics and Home Literacy Questionnaire

Child's Name _____ Child's Birthdate (MM/DD/YY)_____

1. Person completing this form:
   - ☐ Mother
   - ☐ Father
   - ☐ Stepmother
   - ☐ Stepfather
   - ☐ Guardian
   - ☐ Other: _____

2. Child's Ethnicity (Check all that apply)
   - ☐ White/Anglo/Caucasian
   - ☐ African American/Black
   - ☐ Asian, Pacific Islander
   - ☐ Latino/Hispanic
   - ☐ American Indian/Alaskan Native
   - ☐ Other _____

Family Background

3. Parental Relationship Status:
   - ☐ Married
   - ☐ Separated
   - ☐ Divorced
   - ☐ Widowed
   - ☐ Committed Relationship: Number of years together: _____

4. Please give the following data for yourself and where applicable, your partner/spouse/co-guardian.

Relationship to child (e.g. mother, father, step-parent, female guardian, male guardian, etc)	Age	Current Occupation	Hours/Week at Job

Please continue on the next page

5. Please list all children in your family (foster, step, adopted, etc.) by birth order, including the child participating in this study.

Child #	Sex	Age	Child #	Sex	Age
1			5		
2			6		
3			7		
4			8		

6. Please check the highest education level the child's mother or primary caregiver has completed.
   - ☐ Some high school
   - ☐ High School Graduate or GED
   - ☐ Vocational or some college
   - ☐ College/university graduate
   - ☐ Graduate or professional school

7. Please check the highest education level the child's father or co-primary caregiver has completed.
   - ☐ Some high school
   - ☐ High School Graduate or GED
   - ☐ Vocational or some college
   - ☐ College/university graduate
   - ☐ Graduate or professional school

8. Please check your estimated yearly family income before taxes.
   - ☐ Less than $4,999
   - ☐ $5,000 to $9,999
   - ☐ $10,000 to $14,999
   - ☐ $15,000 to $29,999
   - ☐ $30,000 to $44,999
   - ☐ $45,000 to $59,999
   - ☐ $60,000 Plus

9. Which is the primary language spoken in the home?
   - ☐ English
   - ☐ Spanish
   - ☐ German
   - ☐ French
   - ☐ Other: _____

Please continue on the next page

Home Literacy Practices

1. How many hours per day does your child watch TV?
   Mon-Fri___Sat ___ Sun___
2. Does anyone in the home have a library card?
   ___ Yes If yes, how often is it used___
   ___ No

3. Does your family subscribe to newspapers/magazines in hard copy or online?
   ___ Yes If yes: Number of newspapers ___
   Number of adult magazines ___
   Number of child magazines ___
   ___ No

4. Approximately how many minutes is your child read to each day?
   ___ 0
   ___ 1-5
   ___ 6-10
   ___ 11-15
   ___ 16-20
   ___ 20+

5. Approximately how many books does your child own?
   ___ Less than 10 books
   ___ 10-30 books
   ___ More than 30 books

6. How much does your child enjoy being read to?
   ___ 1 Does not enjoy being read to
   ___ 2
   ___ 3 Thinks it is okay
   ___ 4
   ___ 5 Really enjoys being read to

7. Does your child listen to/watch eBooks?
   ___ Yes If yes, how often? ___ Daily
   ___ Several times a week
   ___ Weekly or less
   ___ No

Please continue on the next page

Mother Reading Habits

8. Mother: How often do you read for pleasure?
   ___ Daily
   ___ Several times a week
   ___ Weekly or less

9. Mother: How often do you (mother) read to your child?
   ___ Daily
   ___ Several times a week
   ___ Weekly or less

10. Mother: The following statements describe reading styles. Please indicate your reading style by checking how much you agree or disagree with the following statements

	Completely Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Completely Agree
I read with expression	☐	☐	☐	☐	☐
I read quieter or louder depending on the scene of the book	☐	☐	☐	☐	☐
I read with a monotone voice (little variation in tone)	☐	☐	☐	☐	☐
I read with character voices	☐	☐	☐	☐	☐
I read slower or faster depending on the scene of the book	☐	☐	☐	☐	☐
I read dramatically	☐	☐	☐	☐	☐

Please continue on the next page

Father Reading Habits

11. Father: How often do you read for pleasure?
    ___ Daily
    ___ Several times a week
    ___ Weekly or less

12. Father: How often do you read to your child?
    ___ Daily
    ___ Several times a week
    ___ Weekly or less

13. Father: The following statements describe reading styles. Please indicate your reading style by checking how much you agree or disagree with the following statements

	Completely Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Completely Agree
I read with expression	☐	☐	☐	☐	☐
I read quieter or louder depending on the scene of the book	☐	☐	☐	☐	☐
I read with a monotone voice (little variation in tone)	☐	☐	☐	☐	☐
I read with character voices	☐	☐	☐	☐	☐
I read slower or faster depending on the scene of the book	☐	☐	☐	☐	☐
I read dramatically	☐	☐	☐	☐	☐

Literacy Scale adapted from:
Griffin, E, & Morrison, F. (1997). The unique contribution of home literacy environment to differences in early literacy skills. *Early Child Development and Care*, *127:1*, 233-243

Appendix E. Scripts

Contacting the Child Care Programs to Ask for their Participation

Researcher: "Hi, my name is Trevor Rowe. I'm a student of Ann Austin's at Utah State University and I'm conducting a research study about how reading expression effects child engagement during story time. I'm recruiting parents and children to be a part of this study by talking to child care providers throughout the valley. I'm interested in having the parents and children that attend your center participate. Is there a time we can meet and I can give you more information about this?"

Recruiting Parents

Researcher: "Hi, my name is Trevor Rowe and I'm a doctoral student at Utah State University. I'm currently conducting a study where I'm trying to understand how reading with expression effects children's engagement during story time. I would like you and your child to participate. Here is some more information about the study if you would like to participate." Researcher hands parent letter of consent.

Administration of the Peabody Picture Vocabulary Test

Researcher: "Hi, my name is _____. What is your name?"

Researcher and child build report:

"How are you doing?"

"What have you been doing today?"

"We are going to go to [assessment room] and we are going to look at some pictures together."

Researcher will then follow the script as outlined in the Peabody Picture Vocabulary Test

Watching Russell the Sheep

As the researcher is walking with a child to the assessment room:

Researcher: "Hi, my name is _____. What is your name?"

Researcher and child build report:

"How are you doing?"

"What have you been doing today?"

"We are going to go to [assessment room] and you are going to watch a video."

The assessment room door will remain cracked

In assessment room:

Researcher: Researcher presses record to start video recording.

"Will you please sit here?" Researcher points to the chair at table.

"I'm going to move the chair up so you're closer to the computer."

Researcher then moves the chair into the appropriate position (centered in front of the computer, approximately two feet away, on a piece of tape on floor to). The camera is adjusted up or down so the child's chin is on recording button the screen.

The researcher holds up the book, *Russell the Sheep*, and says, "Has someone read this book to you? It's called *Russell the Sheep*."

If child answers no, researcher continues administration.

If child answers yes: “Can you tell me what happens?” The researcher will then decide if the child remembers the book. If the child remembers two salient points (refer to cognitive assessment) he/she will watch the story but no engagement measures will be administered.

“You are going to watch a video of this book on this computer.” The researcher points to the laptop in front of the child.

“I’m going to press play and leave the room but when the video is done I’ll come back in and we’ll talk about it. Do you have any questions?” After answering any questions, the researcher then presses play and leaves the room. The door will be cracked open and the researcher will stand outside of the room and listen for the story to end.

When the story ends the researcher will enter the room and say, “Now I’m going to ask you some questions about the video you watched.” The researcher then administers the emotional and cognitive engagement assessments as outlined in Appendix C of the dissertation.

CURRICULUM VITAE

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Education

2016	Ph.D. student, Family and Human Development, Utah State University.
2006	B.S. Child Development: Brigham Young University—Idaho.

Employment

2015-Present	Director, Alabama Quality STARS; University of Alabama
2013-2014	Graduate student teacher. Family, Consumer, and Human Development; Utah State University
2011-2013	Faculty: Visiting Professor. Department of Home and Family; Brigham Young University—Idaho
2009-2010	Graduate Student Instructor. Family, Consumer, and Human Development; Utah State University

Teaching Experience

2013-2014	Graduate Student Instructor. Class: Middle Childhood Lab. Family Consumer and Human Development; Utah State University
2013-2014	Graduate Student Instructor (1 of 2 or 3 teachers). Class: Balancing Work and Family. Family Consumer and Human Development; Utah State University
2013-2014	Graduate Student Instructor. Class: Infancy and Childhood. Family Consumer and Human Development; Utah State University

2013	Instructor. Class: Curriculum for Young Children. Department of Home and Family; Brigham Young University—Idaho
2012	Instructor. Class: Afterschool Practicum. Department of Home and Family; Brigham Young University—Idaho
2011-2013	Instructor. Class: Family and Community. Department of Home and Family; Brigham Young University—Idaho
2011-2013	Instructor. Class: Observation and Assessment. Department of Home and Family; Brigham Young University—Idaho
2011-2013	Instructor. Class: Early/Middle Childhood. Department of Home and Family; Brigham Young University—Idaho
2010	Teaching Assistant. Class: Child Guidance; Family, Consumer, and Human Development Department. Utah State University. Responsibilities: Teaching, grading, assisting students. Professor: Kelli Barker
2010	Teaching Assistant. Class: Preschool Methods and Curriculum. Family, Consumer, and Human Development Department. Utah State University. Responsibilities: Teaching, grading, assisting students. Professor: Farol Ann Nelson
2009-2010	Graduate Student Instructor. Class: Human Development Across the Lifespan. Family, Consumer, and Human Development Department; Utah State University
2008	Teaching Assistant. Human Development Across the Lifespan. Family, Consumer, and Human Development Department; Utah State University. Responsibilities: Teaching, grading, assisting students. Professor: Gina Cook
2007-2008	Teaching Assistant. Marriage and Family Relationships. Family, Consumer, and Human Development Department; Utah State University. Responsibilities: Teaching, grading, assisting students. Professor: Deb Ascione

<u>Research</u>

2008-2010	Child Care Access Means Parents in School (CCAMPIS). Responsibilities: assessment of children and families, manage assessment data, data analysis. Ann M. B. Austin (supervisor).

Publications

Austin, A.M.B., Blevins-Knabe, B., Ota, C., Rowe, T.R., Lindauer, S.L.K. (2011). Mediators of preschoolers' early mathematics concepts. *Early Child Development and Care, 181*(9), 1181-1198. **DOI:**10.1080/03004430.2010.520711

Professional Presentations

2016 Alabama Quality STARS (2015, February/March). Alabama Quality STARS Orientation Session. Mobile, Birmingham, Huntsville, and Montgomery, Alabama.

2014 Rowe, T. R. (2014, December). *Priorities within Balancing Work and Family*. West Jordan Women, Infant, and Children. West Jordan, Utah.

2012 Rowe, T. R. (2012, March). *Reading to Young Children.* Eastern Idaho Early Childhood Training. IdahoSTARS. Rexburg, Idaho

2010 Rowe, T.R., Austin, A.M.B., Rowe, T. (2010, March). *An exploratory study into free reading time and peer tutoring.* Poster presentation. Society for Research in Human Development. San Antonio, Texas.

2010 Ota, C., Austin, A.M.B., Rowe, T.R. (2010, March). *Provider stress and child engagement in child care.* Poster presentation. Society for Research in Human Development. San Antonio, Texas.

Research Grants (unfunded)

2014 Dissertation Enhancement Grant (Office of Research and Graduate Studies at Utah State University). Trevor Rowe. $10,000.

2009 Child Care Access Means Parents in School Grant. Ann Austin, Tom Lee, Trevor Rowe. $149,010.00

2009 The Barbara Bush Foundation for Family Literacy. Trevor Rowe, Maegan Lokteff, Ann Austin. $22,654

Other Employment

2008-2010 Books and Buddies Chair. Responsibilities: Organizing monthly community literacy events for children, parents, and care givers.

2010	Aggie Care. Responsibilities: Taught child care providers to help their efforts in getting their childcare accredited.
2009-2010	Student Study Night Child Care Supervisor. Responsibilities: Assist in providing an enriching environment for children, working with parents, hiring/terminating childcare teachers.
2004-2008	Child Care Teacher. Apple Tree Learning Center. Responsibilities: After school teacher, preschool teacher, Summerfest teacher, creating lesson plans, driver. Class size range: 5-18.

Service

2009-2010	2011 SRCD Biennial Meeting Volunteer Reviewer. Mentor: Belinda Blevins-Knabe
2010 (Fall)	Graduate Student Senator—College of Education, Utah State University
2008-2010	Graduate Student Representative—Family, Consumer, and Human Development Department, Utah State University
2006	Pediatric Volunteer, Eastern Idaho Regional Medical Center, Idaho Falls, Idaho
2005	Secretary for the Child and Family Advocacy Society at BYU-Idaho

Membership in Professional Organizations

2008-Present	National Association for the Education of Young Children

Awards

2015	Alabama Early Learning Guidelines Credential. Alabama Department of Human Resources
2015	Dissertation Completion Scholarship. Office of Research and Graduate Studies. Utah State University
2009	Family, Consumer, and Human Development Department Dale & Adele Young Scholarship. Utah State University

2008	Family, Consumer, and Human Development Department Gregory C. Trevers Scholarship. Utah State University
2008	Teaching Assistant of the Year, Family, Consumer, and Human Development Department. Utah State University
2005	Awarded Department of Home and Family Education Scholarship at BYU-Idaho
2005	Nominated “Man of the Year” for the Department of Home and Family Education at BYU-Idaho