

January 2015

Validity Testing of a Preschool Reading Screening Device for Pediatricians

Erika Elaine Blue

University of South Florida, eblue@mail.usf.edu

Follow this and additional works at: <https://digitalcommons.usf.edu/etd>



Part of the [Curriculum and Instruction Commons](#), and the [Speech and Hearing Science Commons](#)

Scholar Commons Citation

Blue, Erika Elaine, "Validity Testing of a Preschool Reading Screening Device for Pediatricians" (2015). *USF Tampa Graduate Theses and Dissertations*.
<https://digitalcommons.usf.edu/etd/5645>

This Thesis is brought to you for free and open access by the USF Graduate Theses and Dissertations at Digital Commons @ University of South Florida. It has been accepted for inclusion in USF Tampa Graduate Theses and Dissertations by an authorized administrator of Digital Commons @ University of South Florida. For more information, please contact digitalcommons@usf.edu.

Validity Testing of a Preschool Reading Screening Device for Pediatricians

by

Erika Elaine Blue

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science
Department of Communication Sciences and Disorders
with a concentration in Speech-Language Pathology
College of Behavioral and Community Sciences
University of South Florida

Major Professor: Ruth Huntley Bahr, Ph.D.
Carolyn Ford, Ed.D.
Maria Brea-Spahn, Ph.D.

Date of Approval:
July 6, 2015

Keywords: literacy, early intervention

Copyright © 2015, Erika Elaine Blue

Dedication

I would like to dedicate this thesis to my mother and father. Thank you for always encouraging me to work hard and strive to be my best. A special thank you to my father, who never doubted my ability to enter a program and complete my master's degree. You have been with me in spirit these past two years, and I could not have done this without the memory of your constant encouragement and love.

Acknowledgments

There are many individuals who have been integral in encouraging me throughout this thesis process. First and foremost, I'd like to thank my major professor, Dr. Ruth Huntley Bahr. Thank you for convincing me that I was capable of beginning this process and continuing that encouragement throughout the entire journey. You challenged me beyond what I have previously experienced, pushed me from my comfort zone, and allowed me to grow my writing skills along the way. I am forever grateful for your guidance.

I would like to thank the academic and clinical faculty in the department of Communication Sciences and Disorders for opening my eyes to new ideas and interests. A special thank you as well to my externship supervisor, Jenee Bolger, for your constant encouragement, ideas, and spontaneous teaching style. I will always remember our talks regarding clinical ideas and various research topics.

I would also like to thank my fellow peers of the Speech-Language Pathology graduate program. Thank you for answering my questions, providing moral support during difficult days, and inspiring me to be my best academic self. Your friendships are irreplaceable.

Finally, thank you to my friends and family for disabling my fears, validating my skills, and listening to my problems. I couldn't have completed this without you.

Table of Contents

List of Tables	iii
List of Figures	iv
Abstract	v
Chapter 1: Literature Review.....	1
Emergent Literacy Skills	3
Print Awareness.....	4
Emergent Writing	6
Alphabetic Awareness	6
Sound Structure Concepts	8
Phonological Awareness	9
Phonemic Awareness	10
Oral Language	10
Vocabulary	11
Validity of Parental Report	12
Screening of Early Literacy Skills	13
Statement of the Problem	15
Chapter 2: Methods.....	16
Participants	16
Settings.....	17
Materials	17
Reading Screening Test.....	17
Clinical Evaluation of Language Fundamentals-Preschool	18
Test of Preschool Early Literacy	19
Procedures.....	20
Data Analysis	20
Chapter 3: Results	22
Overview of Test Performance	22
Content Validity of the Reading Screener	23
Criterion Validity of the Reading Screener	27
Establishment of a Cut-Off Score	28
Chapter 4: Discussion	30
Evidence of Content Validity.....	30

Utility of Parental Report	31
Reading Screener vs. TOPEL	31
Establishment of Criterion Validity.....	33
Establishment of Appropriate Cut-Off Scores	35
Utility of Findings	36
Study Strengths and Limitations	36
Directions for Future Research	37
References	38
Appendices	43
Appendix A: Kindergarten Reading Screening Protocol (Tridas, 2014).....	43
Appendix B: Email Consent for the Use of the Kindergarten Reading Screening Protocol (Tridas, 2014)	44
Appendix C: University of South Florida Institutional Review Board Approval.....	45

List of Tables

Table 1. Participant Performance on Each Aspect of the Reading Screener, the CELF-P
2, and the TOPEL23

Table 2. Reading Screening Decision29

List of Figures

Figure 1. A breakdown of emergent literacy skills	4
Figure 2. A depiction of the components of phonological processing	8
Figure 3. The comparison of CELF-P2 standard scores with the number of parental concerns from the reading screener	24
Figure 4. The comparison of TOPEL standard scores with the number of correct rhymes based off the reading screener	27
Figure 5. Comparison of pass/fail rates on the reading screener (Tridas, 2004) with the TOPEL standard scores.....	28

Abstract

Despite efforts to improve access to early literacy intervention in the United States, there are still children entering kindergarten that are not adequately prepared for school and are unlikely to catch up to their peers (National Education Association, 2014). Preschool programs are actively involved in screening their students for potential literacy difficulties; however, there are children who do not attend preschool and may not have their literacy development assessed. One solution to this problem is to involve other individuals who routinely see preschool age children. Pediatricians are one such group as children come to them for their wellness visits and vaccinations. It may be possible to involve them in the reading screening process. To this end, a screening device (Tridas, 2014) has been developed by a developmental pediatrician.

The purpose of this pilot study was to establish the content and criterion validity of this reading screening test (Tridas, 2014). Eight preschool children (ages 55-62 months) completed the reading screener, which had two components: a brief parental questionnaire assessing language abilities and a quick check of phonological awareness. The scores on these two subtests were compared with performances on two standardized measures of language function: the *Clinical Evaluation of Language Fundamentals-Preschool -Second Edition* (CELF-P2; Semel, Wiig, & Secord, 2004), a measure of global language skill and the *Test of Preschool Early Literacy Skills* (TOPEL; Lonigan, Wagner, Toregsen, & Rashotte, 2007), a measure of early literacy skills.

Results indicated that the reading screener showed good content and criterion validity. Parental report of language ability was verified by scores on the CELF-P2. The two students with

the lowest scores on the CELF-P2 also received the greatest number of parental concerns on the reading screener. Participants evidenced excellent letter identification skills; however, performance on the rhyming tasks identified those with lower standard scores on the TOPEL. The pass/fail decisions on the reading screener were then compared with the standard scores on the TOPEL and the two individuals who failed both portions of the screener also scored the lowest on the TOPEL. Based on this analysis, cut-off scores for the components of the reading screener were identified. Pilot results indicated that this screening device has potential for the identification of children in need of more complete evaluation of literacy skills. Continued evaluation of this screening device is warranted with a broader sample of preschool children and with pediatricians as the examiners.

Chapter 1: Literature Review

During the preschool years, children are developing literacy skills at a rapid pace (Pelatti, Justice, Pentimonti, & Schmitt, 2014). This period, the emergent literacy phase, covers a time when young children read and write in unconventional ways. Emergent literacy includes pretending to read a book, doing so from the left side of the page to the right side, turning the pages of a book, and even scribbling on paper (Justice, 2006). It is important to create an environment for children that fosters and encourages these forms of early literacy behaviors, as they are foundational to skilled reading and writing (Ezell & Justice, 2005; Justice, 2006).

However, not all children acquire the reading skills that they need to succeed in school in their home environment. This lack of adequate preparation can have long-term consequences on educational success. According to the Executive Summary of the National Early Literacy Panel (Lonigan & Shanahan, 2009), 37 percent of U.S. fourth graders failed to perform at the basic level for reading success). This problem was even higher among low-income families, ethnic minority groups, and English language learners (ELLs). Even though approximately 85% percent of children in the preschool age range are read to “frequently” (three or more times a week) by a family member (National Center for Education Statistics, 2006), there are still groups of children who do not receive adequate literacy preparation at home. The National Education Association (2014) reported that children from lower income homes are less likely to be read to aloud by family members than are children from families that are at or above the poverty line. This could be an indication that the family does not possess literacy materials in the home and/or that the

parents are busy meeting the basic needs of their family. Thus, a cyclical effect can occur, in which these children, like their parents, struggle to thrive in the educational setting and ultimately may even drop out of school all together. It is crucial that the children not exposed to literacy materials are identified early. If identified early, remedial services, like the modeling of shared book reading practices can be provided. This way, parents can be taught to be more involved in their children's early literacy learning.

Children who are read to at home during this critical time period showed more success in writing their name, recognizing the letters of the alphabet, reading (or pretending to read), and even counting to 20 or higher (Ezell & Justice, 2005). This is because shared book reading is a language-rich activity that engages the use of oral language, and draws attention to print and how it is used at an early age. Shared book reading also introduces children to decontextualized language, or language that goes beyond the present and involves the past and future contexts (Ezell & Justice, 2005). Exposing children to decontextualized language forces them to use words in complex ways and readies them for the academic demands of elementary school

Since the exposure to literacy will vary among preschoolers, it is important to screen children for reading skill prior to school entry so that children with possible reading deficits can be identified early. According to a study conducted by Cabell, Justice, Konold, and McGinty (2011), early patterns of performance in children's literacy-related skills (e.g., oral language skills, print concepts, alphabet knowledge, name writing, and rhyme awareness), appear to be important in determining their later reading achievement. Future reading skill is predictable as well, if not better, by measures of receptive and expressive vocabulary, language, and IQ completed at ages three to four than by the same measures taken around the start of kindergarten (Scarborough, 2005). Therefore, it is essential to identify potential language and reading

difficulties early. One way to accomplish this task is to screen all preschool children for reading skill. While preschools would seem to be a logical place to conduct these screenings, some children do not attend preschool. Therefore, an alternative screening provider is needed. The current project will evaluate a literacy screening device for use by pediatricians during a child's annual well visit. Physicians would appear to be well-suited to identify children who may not be attending preschool.

The literature review that follows will first define emergent literacy skills and the importance of screening for deficits of those skills. Then, the validity of parental report and screening of emergent literacy skills will be described. Finally, this chapter will conclude with a statement of the research problem.

Emergent Literacy Skills

Emergent literacy skills can be separated into two categories: code-based skills and oral language skills. As depicted in Figure 1, code-based skills include print awareness, emergent writing, alphabet knowledge, and phonological awareness, which can be further divided into written language concepts and sound structure concepts (Cabell et al., 2011; Ezell & Justice, 2005). Written language concepts include print awareness, emergent writing, and alphabet knowledge, while sound structure concepts include phonological and phonemic awareness. Oral language skills encompass both the expression and comprehension of spoken language.

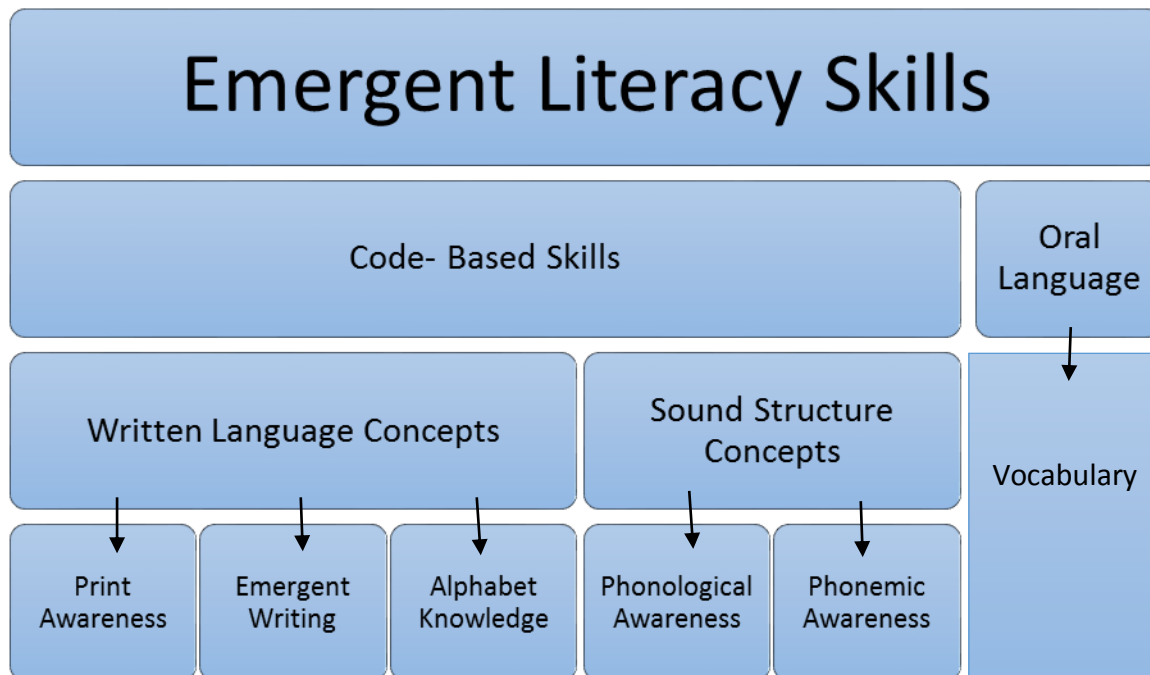


Figure 1. A breakdown of emergent literacy skills

Code-based skills and oral language are important predictive factors of later literacy achievement for preschool children (Justice, 2006). Specifically, word identification, the alphabetic principle, oral reading fluency, and phonemic awareness have been shown to be consistent predictors of reading skill and the need for intervention (Lam & McMaster, 2014). These emergent literacy skills will be described in greater detail in the section to follow.

Print Awareness

Print awareness refers to a child’s attention to the structure and purpose of written language and includes the forms of print available in a child's environment (Pelatti et al., 2014; Stewart & Lovelace, 2006). It is developed along a continuum with children first exhibiting an interest for print and its meaning and eventually shifting to children learning that print units are related to each other (Pelatti et al., 2014). Print awareness develops through the written words

present in a child's environment. Environmental print is typically large, bold and uses varying colors and fonts not typically seen in books (Neumann, Hood, & Ford, 2013). This type of print includes the writing present on toys, popular restaurant signs, or large billboards along a highway.

Research has supported the importance of cultivating environmental print knowledge. Specifically, children who have been instructed with environmental print show higher print motivation than those who receive instruction with the same words within regular text or those children who received no print awareness intervention (Neumann, et al., 2013). This study reported moderate to large positive gains in receptive language abilities for children who were part of the environmental print group. Print awareness also has been shown to improve a child's ability to identify letters and understand print concepts compared to a control group (Neumann et al., 2013). Similar findings were noted in a study using print from popular culture sources (Vera, 2011). Hence, environmental print, especially print that is bold and unique, fosters and sustains emergent literacy growth.

Understanding of the numerous forms and functions of print is best developed in a literacy-rich environment where adults are calling attention to the print (Stewart & Lovelace, 2006). Parents and caregivers can foster an understanding of print concepts by pointing out aspects of print during story-book reading, asking the child print-related questions, and making comments as they read books to the child. Unless an adult deliberately calls attention to aspects of print during shared book reading, a child spends less than 6% of the time looking at the print (Zucker, Ward, & Justice, 2009). In fact, print-referencing, or an instructor calling specific attention to print while reading to children, has been found to significantly increase print knowledge scores when compared to story reading alone (Justice, McGinty, Piasta, Kaderavek,

& Fan, 2010). Children who enter formal reading instruction with a limited understanding of print-related terms will have difficulties learning to read (Zucker, Ward, & Justice, 2009).

Emergent Writing

Emergent writing is the second written language concept and it refers to a child's beginning understanding of how writing can represent ideas. Prior to acquisition of the alphabetic principle, children tend to use drawings, scribbles, and even approximations of letters to create written meaning (Bradford & Wyse, 2012). Puranik and Lonigan (2009) have demonstrated that the universal features of writing (such as writing linearly) develop first. In fact, children as young as three years old have been shown to utilize approximations of specific letter shapes (and other language-specific features of writing) (Bradford & Wyse, 2012).

Many children begin the conventional form of transcription by learning how to write their name. Children who are proficient in writing their names score more favorably on other emergent literacy measures compared to less advanced name writers (Blair & Savage, 2006; Diamond & Baroody, 2013; Puranik & Lonigan, 2012; Yang & Noel, 2006). A child's writing attempts can reveal a growing understanding of other emergent literacy skills, most notably, the alphabetic principle and a child's budding understanding of grapheme-phoneme correspondences (GPCs) (combining knowledge of a letter with its corresponding phoneme) (Ukrainetz, 2006). The following section will explore this emergent literacy skill in depth.

Alphabetic Awareness

Alphabetic awareness is the ability to label upper and lower case letters and the relationship of these letters to oral sounds (grapheme-phoneme correspondence) (Sawyer, 2004; Ukrainetz, 2006). For preschool children, this skill has been shown to be the most predictive of

later reading abilities, including decoding, reading comprehension, and spelling (Kirby & Parrila, 1999; Puolakanaho, Ahonen, Aro, Eklund, & Leppanen, 2007; U.S. Department of Education, 2014). Due to the importance of alphabet knowledge, many literacy programs, such as the Reading First, Early Reading First, and Head Start, aim to improve children's letter and letter-sound knowledge (Piasta, Purpura & Wagner, 2010).

Letter-sound knowledge is the next tier of alphabetic awareness (Evans, Bell, Shaw, Moretti, & Page, 2006). Some letters have distinctive sounds that can be associated with a more recognizable sound to a child, such as the "sssss" of a snake. Children use these types of associations to actively learn not only the letter's name, but also the letter's sound (Evans et al., 2006; Piasta et al., 2010). By teaching letter names and sounds simultaneously, children can learn the phonetic aspects of speech quickly, thus fostering early literacy development (Piasta et al., 2010; Torgesen & Mathes, 1998). Many preschool and early education classrooms now utilize this method of teaching the alphabet, often by using a song or rhyme that the children can memorize.

Assessment of alphabetic knowledge is accomplished in several ways. First is a letter recognition task (Evans et al., 2006). Children typically recognize uppercase before lowercase letters. This is possibly due to the teacher's early emphasis on uppercase letters, their distinctiveness in terms of size and shape compared to lowercase letters, or the prominence of uppercase letters in books and other print sources (Evans et al., 2006). Letter recognition has been shown to precede, predict, and even improve performance on letter-sound knowledge tasks because many letters possess names that include their sound (i.e.; the letter "s" or "m") (Evans et al., 2006; Piasta et al., 2010).

Sound Structure Concepts

Phonological processing, a code-based skill and sound structure concept, refers to the identification, understanding, storage, retrieval, and production of sounds (see Figure 2).

Phonological processing can be further broken down into three categories: phonological recoding, graphophonemic knowledge, and phonological awareness (University of Oregon Center on Teaching and Learning, 2014). Phonological recoding involves the use of working memory and lexical retrieval to access stored information about letter- sound correspondences (graphophonemic knowledge) in order to read or spell an unfamiliar word (University of Oregon Center on Teaching and Learning, 2014). Graphophonemic knowledge, sometimes referred to as phonics, is the child's recognition and comprehension of letter to sound relationships. The final category, phonological awareness, will be discussed in depth in the next section.

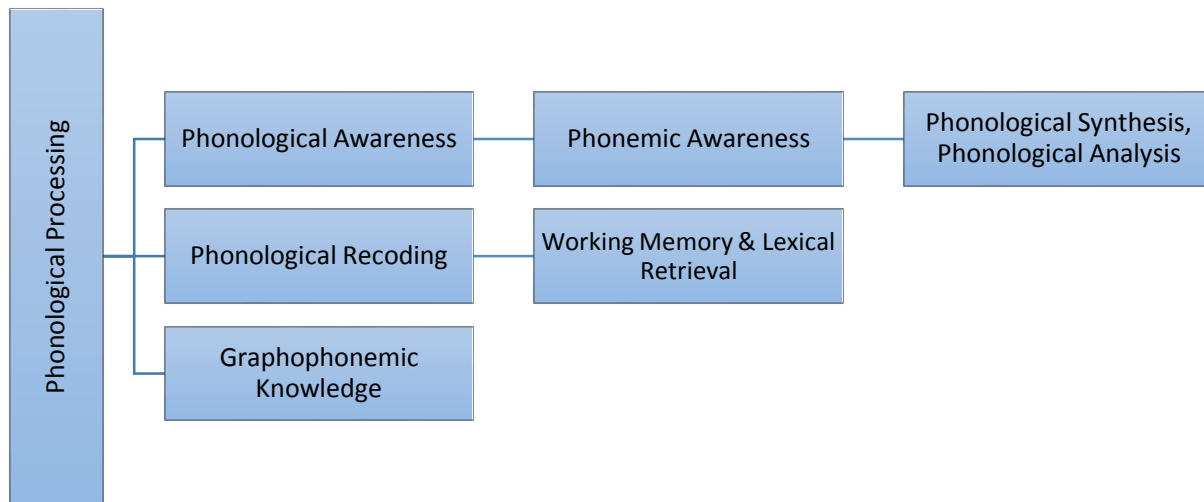


Figure 2. A depiction of the components of phonological processing

Phonological Awareness. Phonological awareness is the conscious understanding that language is comprised of discrete sounds that can be manipulated into words, syllables, and phonemes (Scott, 2009; Troia, 2014). Phonological awareness enables the child to process and reflect on the sound properties of language (otherwise known as metalinguistic awareness) (Gillon, 2004; Scott, 2009). Young children often initially focus on the content of speech, but their focus shifts to the form of speech as they are explicitly taught phonological awareness (Scott, 2009). The comprehension of written words, in turn, supports the child’s ability to read and become conventionally literate (Torgesen & Mathes, 1998).

Many researchers have found phonological awareness instruction to be the most effective method for acquiring reading and spelling skills (Culatta & Hall, 2006; Ouelette & Haley, 2013; Scott, 2009; Stewart & Lovelace, 2006). As the earliest developing phonological awareness skills, rhyming and alliteration are often worked into songs and word play. Although preschool-aged children do not yet have the conscious awareness of individual parts of words, such as onsets (the part of the word before the vowel), rimes (the part of the word including the vowel and what follows it), or phonemes, they do possess the ability to detect the differences between sounds. This ability allows children to have early success in alliteration (occurrence of the same letter/sound at the beginning of two or more adjacent words; “Sally sells sea shells”) and rhyme (a word or syllable that contains the same ending sound but different beginning sounds; “run” and “fun”) tasks (Troia, 2013). These types of tasks help the child develop the ability to focus on word parts, rather than the whole word. By measuring these two early skills, knowledge of the child’s early phonological awareness can be tested (Moyle, Heilmann, & Berman, 2013). Once a child enters into school, the more difficult phonemic awareness tasks are appropriate. A description and examples of these task are described in the section to follow.

Phonemic Awareness. Phonemic awareness refers to one's ability to manipulate individual phonemes within words (Berek, 2013). For instance, with appropriate phonological awareness, a school-age child can tell that the word *chocolate* has more sounds in it than the word *candy*. They can also indicate that each word begins with a different sound (Scott, 2009). However, phonemic awareness involves a deeper level of metalinguistic awareness because it involves the synthesis, or blending of sounds (putting the phonemes c-a-t together and producing “cat”) and the analysis, or segmentation of sounds (what are the sounds in the word “cat”?) (Hempenstall, 2011; Kantor, Wagner, Torgesen, & Rashotte, 2011). These abilities are key indicators of later reading success (Scott, 2009). Such skills typically develop after a child has begun kindergarten. Without these varied phonological and phonemic awareness abilities, children would be unaware of the important relationship between oral sounds and print (Torgesen & Mathes, 1998).

Oral Language

Oral language complements the foundations provided by the code-based skills (see Figure 1) by defining the roles of comprehension and expression of spoken language (Cabell et al., 2011). Although oral language and code-based skills often develop at a separate pace, competence in one area can strengthen the other area. For example, children with good oral language abilities will possibly engage more in early literacy activities, and in turn, display good code-based skills (Cabell et al., 2011). According to the Executive Summary of the National Early Literacy Panel (Lonigan & Shanahan, 2009), oral language is one of 11 variables that consistently predicts later reading achievement for both preschoolers and kindergarteners. Specifically, it was found that oral language better predicts later literacy achievement when specific aspects of oral language are targeted (grammar, the ability to define words, and listening

comprehension) (Lonigan & Shanahan, 2009). The quality of a child's oral language exposure, as well as the quantity of the oral language interactions, is important for their development of the syntactic rules of the language, new vocabulary acquisition, and even emotional development (as it fosters social interaction and connection with others) (Hill, 2009; Weitzman, Girolametto, & Greenberg, 2006). A recent study examined children in disadvantaged schools and the impact of specialized professional development on the importance of oral language. The students taught by teachers who had received the specialized training in oral language performed better on all standardized measures (specifically vocabulary, syntactic understanding, and some aspects of phonemic awareness) due to their exposure to various targeted language domain activities (i.e. phonemic and phonological awareness) (Snow, et al., 2014). Vocabulary development was also a targeted language domain in this study, as it relates to both oral language competence and early literacy success. Vocabulary will be discussed in depth in the next section since it is a highly predictive measure for early reading achievement (Pelatti et al., 2014).

Vocabulary. Vocabulary, which can be categorized by both breadth (the number of words a child knows) and depth (the quality of knowledge about the word that a child has), has been shown to be highly predictive of early reading success in kindergarten (Pelatti et al., 2014). In fact, the size of a child's vocabulary at the age of three years is significantly correlated with learning to read and reading comprehension at the end of third grade (Hart & Risley, 2003). Additionally, the breadth of a child's vocabulary is directly related to the amount of exposure the child has had to story book reading (Hill, 2009). In terms of depth, the complex language and rich word choices used in books exceeds those used in spoken conversation (Hill, 2009).

It is also important to note that oral vocabulary is one of the most highly visible aspects of a child's language development (Hill, 2009). Hence, parents/caregivers will most likely have

a stronger sense of their child's oral vocabulary skills than other language skills (i.e., written language). For this reason, oral vocabulary is a simple, yet strongly effective measure of a child's early literacy and language success (Hill, 2009).

All of these early literacy skills focus on word level knowledge and can be used to assess later reading success. However, it is also important to have a general understanding of a child's receptive and expressive language skills. While there are many tests available to assist in that determination, parents/caregivers also can provide a representative picture of their child's understanding and use of language.

Validity of Parental Report

The use of parental report of a child's general language abilities is a valuable and easily attainable resource for clinicians and researchers alike. Parental/caregiver insight provides information about the child's development of language, as well as their ability to use language in multiple contexts (i.e., at home, with peers, etc.) (Boudreau, 2005). Although the research on the parental report of literacy skills is limited, the findings are promising. Researchers have found that mothers tend to slightly overestimate their child's level of success on literacy tasks; yet these assessments did correlate strongly with standardized literacy measures (Dickinson & DeTemple, 1998; Korat, 2011). Additionally, parents of children with diagnosed learning disabilities (such as specific language impairment) were found to be even more proficient at identifying their child's language strengths and weaknesses (Boudreau, 2005; Conti-Ramsden, Simkin, & Pickles, 2006). Bishop and McDonald (2009) support using parental report in conjunction with formal assessments when evaluating the language skills of young children. In this way, a much clearer and more complete picture of the child's language and emergent literacy development can be obtained.

Screening of Early Literacy Skills

Given our knowledge of early predictors of literacy and the importance of reading in the academic process, early identification of reading difficulties (i.e., the determination of school readiness) is important (Invernizzi, Landrum, Teichman, & Townsend, 2010). Programs that stemmed from the *No Child Left Behind Act*, such as Reading First and Early Reading First, began surfacing in early 2002, setting the stage for heightened attention to national and state-specific reading programs and early intervention (U.S. Department of Education, 2014). While limited research exists on the effectiveness of the Early Reading First programs, there are indications that children receiving early reading intervention show statistically significant gains in picture naming, vocabulary, and print knowledge when compared to a non-treatment control group (Hilbert & Eis, 2014). In a separate longitudinal study, researchers found that 75 predominantly African-American children experienced significant gains in their oral language and code-related skills (e.g., print and phonological awareness) during preschool and that these students generally maintained these new skills for the next two years (Bingham & Patton-Terry, 2013). These findings suggest that intervention in the pre-kindergarten classroom could change the trajectory of literacy development.

Despite efforts to improve access to early literacy intervention in the United States, there are still children entering kindergarten that are not adequately prepared and are unlikely to catch up to their peers (Pelatti et al., 2014; Snow et al., 2014). This calls for increased attention to emergent literacy screening prior to the child's Kindergarten year (Invernizzi, et al., 2010). In order to have an effective literacy screening measure, it was found that the measure must be broad, sensitive, easily and efficiently administered, and easily interpreted (Justice, Invernizzi, & Meier, 2002). For instance, Wilson and Lonigan (2009) compared the following brief emergent

literacy screeners; the *Get Ready to Read- Revised!* (GRTR-R) and the *Individual Growth and Development Indicators* (IGDIs) to determine their effectiveness. The GRTR-R assesses print knowledge and phonological awareness, while the IGDI assessed phonological awareness (alliteration and rhyming), as well as oral language (picture naming). The results of both screening devices were correlated with those of the *Test of Preschool Early Literacy* (TOPEL; Lonigan et al., 2007). Results indicated that both emergent literacy screening measures could be utilized effectively to identify potential reading difficulties, indicating a need for more in-depth assessment. These researchers warned that screening measures in general did not provide information on specific weaknesses or strengths, but that the use of the measures serves its set purpose; identifying children who are at-risk for later reading problems (Wilson & Lonigan, 2009).

Another available emergent literacy screening device is the *Phonological Awareness Literacy Screening* (PALS-PreK; Invernizzi, Sullivan, Meier, & Swank, 2004). This measure contains 121 items and in comparison to the two screeners previously mentioned, takes much longer to administer and interpret (Wilson & Lonigan, 2009). Although the PALS includes several important emergent literacy tasks (i.e., alphabet knowledge, phonological awareness, emergent writing, and print concepts), it may not meet the needs of preschools with financial or time constraints (Invernizzi, et al., 2010; Wilson & Lonigan, 2009). Hence, there is a need to continue to develop screening devices that quickly and effectively identify preschool children at risk for future reading difficulties. Since many, but not all young children attend preschool, it also might be beneficial to extend literacy screening beyond the educational setting. Given an appropriate screening tool, pediatricians might be able to meet such a need.

Statement of the Problem

A screening device for use by pediatricians has been developed (Tridas, 2014). This measure is designed for use during yearly wellness visits to reach a large number of children before they enter school. Doctors then could work with the preschools in the early identification of children who are at risk for literacy difficulties. Completing early literacy screening in a pediatrician's office is especially important since not all children will attend public school, opting for private and home schooling. These children may miss important literacy assessments that the children in public schools typically receive.

This study is designed to establish the content and criterion validity of the reading screening test developed by Dr. Eric Tridas (2014), a developmental pediatrician. Content validity will determine if the reading screening measure contains the early literacy skills necessary to detect language or literacy difficulty. Criterion validity will examine if the reading screening measure adequately predicts an outcome of language or literacy difficulty, compared to the two standardized measures. The following questions were asked:

- 1) Is the content validity of parental report of language ability and the phonological awareness sections of the screening tool supported by standardized measures of these skills?
- 2) Does the level of criterion validity obtained from comparisons of the standardized test performances to the screener's recommendations support the use of this reading screener?

Chapter 2: Methods

Participants

The participants for this pilot study were eight typically developing children from the university community, including those enrolled in a voluntary pre-Kindergarten (VPK) program at a preschool associated with this university in west central Florida. The children ranged in age from 55 to 62 months and there were four male and four female participants. Children were not included in this study if a parent or teacher reported that they were not typically developing, if they had a permanent hearing loss, or if they were receiving any speech, language, or hearing services. Informed consent was obtained from each participant's parent(s) or guardian and assent was obtained from each participant prior to testing. This study was approved by the Institutional Review Board at the investigator's university.

Participants were recruited by having the preschool teacher place flyers describing the research project in their daily files for the parents to pick up. Participants were also recruited by distributing flyers among students enrolled in the Department of Communication Sciences and Disorders at the local university. Interested parents were asked to contact the investigator's research advisor by email to indicate a desire for their child to participate in this project. The parents were then sent the informed consent form via email. After signing the consent form, parents scanned and returned the form to the investigator's research advisor. Once the informed consent was received, the investigator's advisor emailed a copy of the parental report section of

the screener to the parent(s) to complete and return. They were also notified of when their child would be tested.

Testing was conducted at the preschool during the day. Children were tested during play times; no instructional time was missed. The children recruited from community contacts were tested in a quiet room at the local university speech-language-hearing clinic. They were tested in January and February, indicating that they had been enrolled in a VPK program for 5-6 months.

Settings

The preschool is associated with the Department of Education and is located on campus at a west central Florida university. This preschool serves a variety of families, including university faculty member's children and children from the surrounding community, which is predominantly low-income. The teachers at the facility involved believe in the value of inquiry and its use to foster cognitive, social, emotional, and physical development. In addition, the preschool values the importance of multi-modal learning, i.e., the use of a variety of teaching styles and methods to engage their students and encourage student expression in multiple ways. Teachers are expected to use developmentally appropriate practices, as well as actively evaluate their inclusion of the school's philosophy into their daily class routines. .

Materials

The screening measure (Tridas, 2014) and two standardized measures of language and phonological awareness were administered. Each of these measures will be described below.

Reading Screening Test. A reading screening device (Tridas, 2014) was developed for use by pediatricians to assess early literacy during a child's wellness visit. This particular measure was developed for use with children prior to the beginning of Kindergarten. The

screening device contains a history screening section and a brief screening of reading skill. A copy of this screening test is included as Appendix A.

The history screening section is a concise, yet comprehensive, questionnaire for the parent or caregiver to fill out. This questionnaire obtains information about oral language development during the child's first 24 months. Other items target oral language, early phonological awareness, and alphabet knowledge. The parental report questionnaire concludes with an inquiry of the family's history of language/reading disorders and a question on whether the parent/caregiver believes that their child has a language/reading difficulty. Based on the parent's/caregiver's responses to these questions, a pass/fail recommendation is to be made by the examiner.

The screening test portion is completed by the screening personnel/pediatrician. It contains a brief assessment of alphabetic knowledge, specifically the naming of uppercase letters, as well as early phonological awareness using a rhyming task. This section concludes with a pass/fail decision and a note indicating if the clinician is concerned about the child's reading skills. A pass/fail of the child's hearing screening is also included. The two sections of the screening device (the parental history report portion and the screening portion) are then considered and a pass/fail judgment is rendered.

Clinical Evaluation of Language Fundamentals-Preschool. The *Clinical Evaluation of Language Fundamentals-Preschool-Second Edition* (CELF-P2; Semel, Wiig, & Secord, 2004) assesses both expressive and receptive language through verbal response to a stimulus picture. It is comprised of the following four levels; Level 1 which determines if a language disorder is present, Level 2 which explains the nature of the disorder, Level 3 determines if early classroom, as well as literacy fundamentals, are affected, and finally, Level 4, assesses pragmatics. For the

purposes of this pilot study, only Level 1 was administered, since the identification of a language disorder was the goal. Level 1 takes approximately 15 to 20 minutes to administer. Subtests of Level 1 on the CELF-P2 include Sentence Structure, Word Structure, and Expressive Vocabulary.

The reliability of the CELF-P2 was estimated through the use of test-retest stability. This indicates that the test is stable and dependable across multiple administrations of the assessment. A sample of 120 children, representative of the U.S. population, was tested using the CELF-P2. These participants were then retested, with the same examiner, within 2 to 24 days. The stability coefficients for the subtests ranged from .78 to .90, with average composite score stability coefficients of .91 to .94.

Test of Preschool Early Literacy. The *Test of Preschool Early Literacy* (TOPEL; Lonigan, et al., 2007) assesses print ability, phonological awareness, and oral vocabulary for children from three to five years of age. The TOPEL has three subtests; Subtest 1 is print knowledge, which includes alphabet and early written language knowledge, Subtest 2 is definitional vocabulary (the child is shown a picture and asked to name it), and Subtest 3 is phonological awareness (including elision and blending tasks). Each subtest has between 27 and 36 items. It takes approximately 25 to 30 minutes to administer the TOPEL in its entirety.

The TOPEL was normed on a sample of 842 children from 12 different states, which represented the United States as a whole. The internal consistency of the items on the TOPEL was examined using Cronbach's alpha. For each subtest, print knowledge, definitional vocabulary, phonological awareness, as well as the composite score, the Cronbach's coefficient alpha rounded to or exceeded .90. Researchers also examined the reliability of the TOPEL when used with subgroups of the population, i.e., males, females, White/European Americans,

Black/African Americans, and Hispanic Americans. The Cronbach alphas for each group proved to be equally reliable, which supported the idea that the TOPEL contained no bias for any particular gender, race, or ethnic group.

Procedures

Each child was seen for one session. The researcher either went to the child's classroom to pick him/her up for testing when testing at the University affiliated preschool, or met the child and their parent in the university's Speech-Language-Hearing clinic. After the researcher explained the project to the child, testing commenced. Prior to the initiation of the assessments, the child underwent a brief hearing screening. Following the hearing screening, the reading screener was administered, which was followed by the TOPEL and the CELF-P2. The latter two tests were given in random order to avoid any effects related to the order of test administration. Each test was administered according to test protocols to avoid any biases. All tests were scored according to the test manual and the test scores were placed in an Excel file by the examiner for analysis.

Data Analysis

Scatterplots were drawn to establish content validity. Scores from the parental portion of the reading screener were plotted against their corresponding scores from the CELF-P2. Scores from the phonological awareness portion of the screener were plotted against their corresponding TOPEL scores.

Criterion validity was established by correlating the Pass/Fail rates on the screener with the standard scores on the TOPEL, as the reading measure. Finally, a cut-off score for the screener was determined by comparing the children's performance on the subtests of the screener

(i.e., parental concern, letter identification, and rhyming) with their overall pass/fail rates on the screener. Once a cut-off score is identified, false positive and false negative rates should be established.

Chapter 3: Results

This study was designed to establish the content and criterion validity of a reading screening test for pediatricians (Tridas, 2014). The first goal was to determine if the content validity of parental report and reading screening sections of the screening device were supported by the results of standardized measures. The second goal was to determine the criterion validity of the reading screener in identifying potential reading problems by comparing student responses to their performance on an age-appropriate test of early literacy skills, the TOPEL. Finally, the establishment of a cut-off score for the reading screener was established by examining individual student performances.

Overview of Test Performance

All participants completed the reading screener, the CELF-P2, and the TOPEL. These results are listed in Table 1. Even though the number of participants was small, there was variability in performance noted on the reading screener. Five out of eight parents indicated that they had no concerns about their child's language or reading ability. Potential language/reading difficulties were noted in the other three children tested.

In terms of performances on the phonological awareness portion of the screener, the participants demonstrated strong performance at identifying letters of the alphabet, with all but one child identifying all of the letters presented. The last child only missed one letter for a total of 13 out of 14 letters identified. More variability in performance was noted on the rhyming

portion of the reading screener. Fifty percent of the children (4 out of 8) correctly rhymed both words, while two children were able to rhyme one word and the remaining two children rhymed none of the words correctly.

In terms of the standardized measures, five out of eight children performed within the average range, and one child scored just slightly below one standard deviation of the mean on the CELF-P2. Standard scores ranged from 84 to 114, with a mean of 103.5. On the other hand, seven out of eight children scored above 100 on the TOPEL, with all participants scoring within one standard deviation of the mean. The standard scores for the TOPEL ranged from 89 to 118, with a mean of 107.25.

Table 1. Participant Performance on each Aspect of the Reading Screener, the CELF-P2, and the TOPEL.

Parental/Clinician Concern	Letters Identified	Correct Rhymes	TOPEL	CELF-P2
5/8 Scored 0 (No concerns)	7/8 scored 14/14 correct	4/8 scored 2/2 correct	7/8 scored over 100	5/8 scored over 100
Mean=1.25	Mean=13.88	Mean=1.25	Mean=107.25	Mean=103.5

Content Validity of the Reading Screener

To establish content validity, each participant was tested with two standardized measures, the CELF-P2 and the TOPEL. Their performance on these measures was compared with their performance on the reading screener (Tridas, 2014). CELF-P2 scores were compared to the number of concerns noted on history section of the reading screener (the parental report portion). Each of these measures provided information regarding the child’s developmental, as well as

current language abilities. TOPEL scores were compared to the rhyming and letter identification portions of the screener, as both are measures of phonological awareness.

The data indicated that the reading screener has good content validity based on several findings. Children identified as having three or four parental concerns also had the lowest standard scores on the CELF-P2 (see Figure 3). The reading screener (through the use of parental reported concerns) was able to identify the children with the lowest average standard language scores. This important finding indicates that through the utilization of the screening device, children with potential language concerns and the need to undergo a full language/literacy evaluation can be identified quickly.

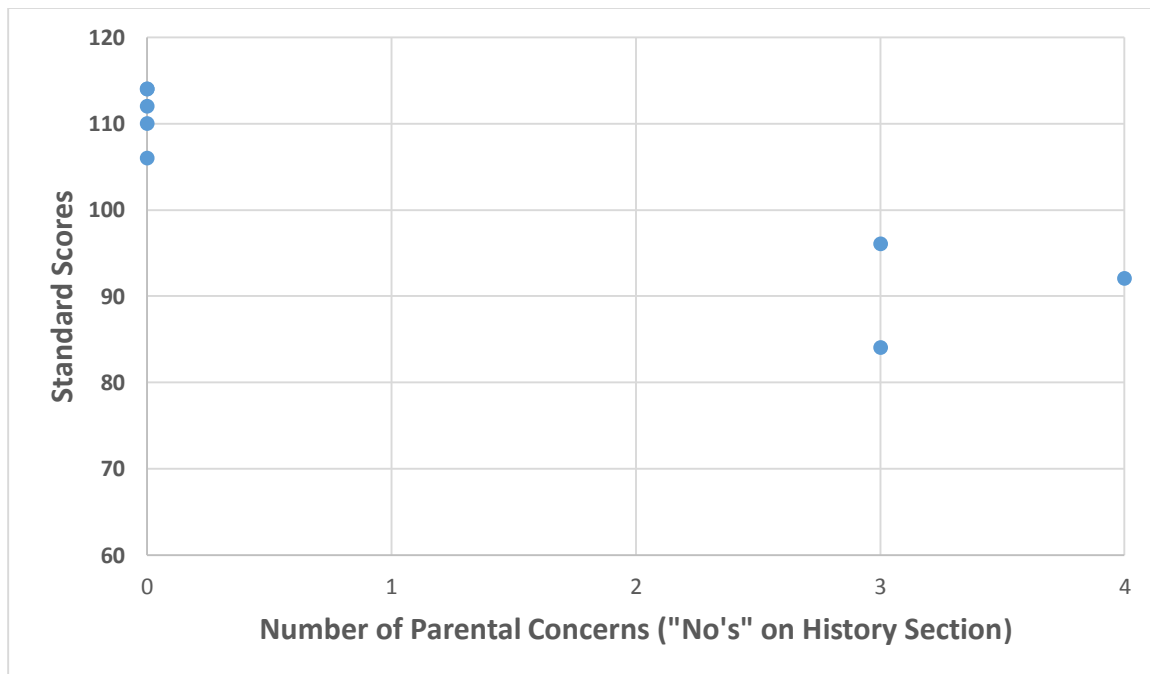


Figure 3. The comparison of CELF-P2 standard scores with the number of parental concerns from the reading screener

The TOPEL is designed to test a broader age range of children than the current screening, so there were several discrepancies in the findings. For example, the TOPEL does not have a letter identification section, so performance is compared to reports in the current literature (Piasta, Yaacov, & Justice, 2012). These investigators have shown that pre-kindergarten children in publicly funded preschools can identify an average of 18 uppercase letters and 15 lowercase letters by the end of preschool. In the current study, all children correctly identified at least thirteen out of a total of fourteen upper case letters. This discrepancy with this literature is possibly due to the socio-economic status and/or educational backgrounds of the children assessed, as most of our participants attended a preschool on a university campus and therefore, most have parents that work or attend the university. It could also be a result of the letters assessed on the reading screening device, as they were all presented as capital letters and possibly the most identifiable for this age range, whereas in the literature (Piasta et al., 2012) all letters (in both cases) were assessed and represented. Therefore, their high level of letter identification skill may not be representative of chronologically age-matched peers. So in this case, letter identification on the screening device did not directly predict the spread of performances on the TOPEL.

In addition, the TOPEL has two different question types: closed and open set. Closed set questions require the child to point to the letter given four choices and open set questions require the child to look at a picture of the letter and state its name. The pediatrician screening device (Tridas, 2014) had an open set style of questioning, as it required the children to look at the upper case letter and then state its name. Overall on the TOPEL, the current participants made the most errors on lowercase letters. Even with these errors, all of the children in the study performed within the average range for this subtest of the TOPEL. It is important to note that all

letters presented on the screening device were uppercase and that the two uppercase letters missed on the TOPEL (“Y” and “L”), are not present on the screener.

The TOPEL also had a phonological awareness subtest, which proved to be the most difficult task for these participants. This subtest required the students to perform blending and elision, which are only addressed on the kindergarten and grade 1 versions of the reading screener (Tridas, 2014). Since these are later developing reading skills (Hempenstall, 2011; Lonigan, et al., 2007), it is not surprising that these tasks were more difficult for the current participants.

In terms of rhyming, which is a developmentally appropriate skill for this age-range of children, there was not a clear pattern between rhyming ability on the screening device and performance on the TOPEL’s phonological awareness subtest. For example, one child received a 13/27 on the TOPEL phonological awareness subtest, but correctly rhymed both of the two words on the screener. Likewise, one child received a 25/27 on the subtest, but missed one out of two of the rhymes on the screener. It was noted, however, that the two children that missed both rhyming words on the reading screener, also received the lowest overall standard scores on the TOPEL (see Figure 4). Overall, these findings demonstrate the ability of the reading screener to quickly assess for and identify children who have phonological awareness difficulty with age appropriate tasks (in this case, rhyming).

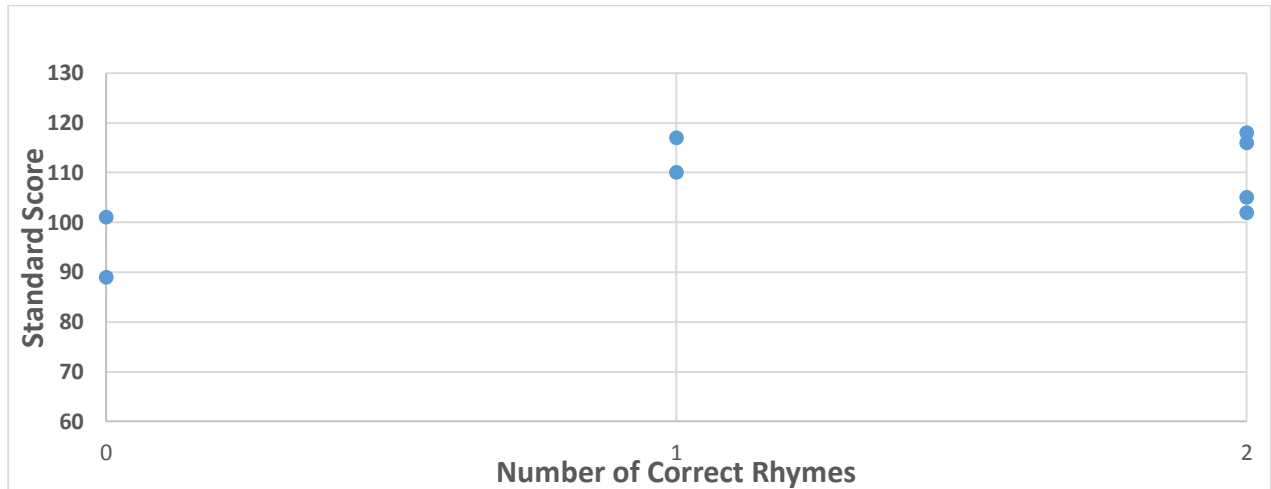


Figure 4. The comparison of TOPEL standard scores with the number of correct rhymes based of the reading screener

Criterion Validity of the Reading Screener

Criterion validity was determined by comparing the participant’s overall performance (pass or fail) on the reading screening device with their standard score on the TOPEL, since this was the standardized literacy assessment selected. Overall, the data indicated that the reading screener has good criterion validity. The two children who ultimately failed the reading screener, also had the lowest standard scores on the TOPEL. One of these children performed with a standard score of 89, which was in the low average range, while the other child performed with a standard score of 101, which is indicative of average performance. As displayed in Figure 5, the two children who failed the screening device were clearly slightly lower than the average standard score on the TOPEL for this population of children.

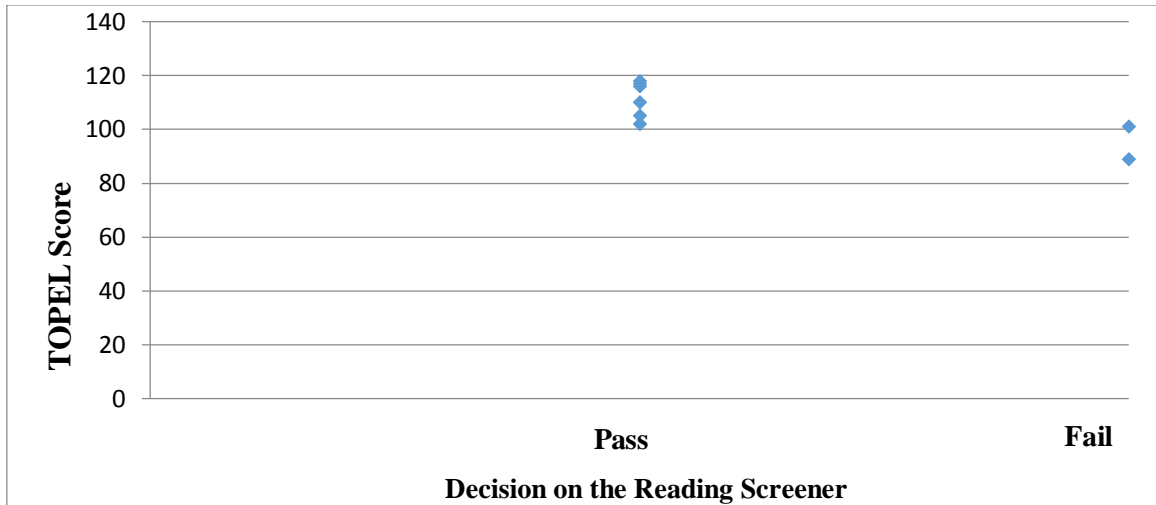


Figure 5. Comparison of pass/fail rates on the reading screener (Tridas, 2014) with the TOPEL standard scores

In terms of the parental report component of the reading screener, two of the three children with parental concerns, also went on to fail the rhyming portion of the screener (scoring a zero out of two rhymes) and the screening device as a whole. The remaining case was a child with parental concerns during his development up to 24 months, but no concerns at the child’s current age. This particular child ultimately passed all sections of the reading screener (letter identification and rhyming) despite the parental concerns. In addition, this child also performed within the average range for his age range on both standardized measures. The decision to pass him on the reading screener was made because these concerns did not refer to his language skills at the present time. Two additional children with parental developmental concerns prior to 24 months also had concerns for the child’s present level of functioning. These present concerns were found to be legitimate since each child also failed the reading screener (see Table 2). The remaining five children had no noted parental concerns on the reading screening device.

Establishment of a Cut-Off Score

Based on the above discussion, the following cut-off scores for each section of the reading screener are suggested: more than one parental concern, 9 letters identified and generation of one rhyming word. Our participants were five to six months into the VPK school year (the half way point), so we came to the decision of 9 letters due to the current literature by Piasta et al. (2012) that states pre-kindergarten children in publicly funded preschools can identify an average of 18 uppercase letters and 15 lowercase letters by the end of preschool. One rhyme out of two was sufficient to pass due to the strong relationship between one or two correct rhymes and an average standard score on the TOPEL. Finally, the participant’s performance on the subtests of the reading screener were compared to the pass or fail decision rate on the reading screener (see Table 2) to confirm the utility of these cut-off scores. Overall, the reading screener showed good content and criterion validity. The parental reports as well as the rhyming section accurately identified the two children who also had the lowest standard scores on the TOPEL and the CELF-P2.

Table 2. Reading Screening Decision

Screening Decision	Parent Concern	Letter ID	Rhyme
Pass	5	6	6
Failed	1	0	0
Subtest/Passed Screener			
Passed	0	2	0
Subtest/Failed Screener			
Failed Both	2	0	2

Chapter 4: Discussion

Early literacy assessment is critical for children who have, or are at-risk for, language and literacy delays. This pilot study was conducted to provide preliminary data regarding the content and criterion validity of a reading screening device (Tridas, 2014) that can be used by pediatricians during a pre-kindergarten wellness visit. Study results will be discussed as they relate to the two research questions. The first research question established the content validity of parental report of language ability as well as the phonological awareness sections of the reading screener. The second research question considered the criterion validity of the reading screener and proposed cut-off scores for the reading screener. This chapter will end with a discussion of the establishment of cut-off scores, the study's strengths and limitations, and a presentation of future research directions.

Evidence of Content Validity

In order to establish content validity, each participant was tested with two standardized measures, the CELF-P2 and the TOPEL, and then their performance on these measures was compared with their scores on the reading screener (Tridas, 2014). The reading screening device serves the purpose of quickly determining if the child warrants further, more in depth testing (i.e., that from a standardized test). It is simply a pass or fail decision. The standardized measure, however, delves deeper into the details of the child's specific areas of weakness. By comparing the two forms of assessment, it is possible to validate the sensitivity of the reading screener in identifying children that warrant more in-depth literacy assessment.

The children's CELF-P2 scores were compared to the reading screener's history section (the parental report portion) and their TOPEL scores were aligned with the letter identification and rhyming portions of the screener. Descriptive analysis of the data revealed that the reading screener had good content validity when compared to the children's standardized scores on the CELF-P2 and the TOPEL. This analysis will be further discussed in the sections to follow.

Utility of parental report. The responses on the parental report section of the reading screener were consistent with previous literature substantiating the parent's ability to identify valid concerns within their child (Bishop & McDonald, 2009; Dickinson & DeTemple, 1998; Korat, 2011). The parental report responses were verified and compared to the children's performance on the CELF-P2, the standardized language measure that was utilized in this study. Of the three children identified with parental concerns, two showed difficulty with the rhyming section of the reading screener, and each had low average scores on the CELF-P2. The parents of the children with the two lowest scores on the CELF-P2 were aware of their child's difficulties and this was reflected in their responses on the reading screener where they noted three and four concerns, respectively. The parents of five of the six children who did not show any concerns on the standardized measures or reading screener subtests were also accurate in not identifying their children as having difficulties. The one participant whose parental concerns were not confirmed by the standardized measures was only found to have developmental concerns that did not extend past 18 months of age. The parent in this case displayed good knowledge of her child's abilities at his present age, which corroborated with his average performance on the standardized measures.

Reading screener vs. TOPEL. In terms of letter identification, pre-kindergarten children in publicly funded preschools should be able to identify an average of 18 uppercase letters and

15 lowercase letters by the end of preschool (Piasta et al., 2012). All children in this study correctly identified at least thirteen out of a total of fourteen upper case letters, which suggested strong letter identification abilities.

As previously stated, the current findings may be reflective the type of participants tested. This group of children had parents who either worked at the University or were working on a college degree. As such, these children probably were being raised in a print-rich environment. . Therefore, their high level of letter identification skill may not be representative of chronologically age-matched peers that are of lower socio-economic status. As discussed in the literature, children from lower income homes are less likely to be read to and in turn, have less overall exposure to print (i.e., letters) (National Education Association, 2014).

For letter identification on the TOPEL, both upper and lower case letters were presented, for a total of sixteen letters. There were two different question types; closed set questions and open set questions. For the closed set questions, the examiner presented the letter verbally, and the child was required to choose the target letter from a choice of four written letters on a page. For the open set questions, the child was required to look at a picture of the letter and then state its name. The children in this study had the most success with the closed set questions and more difficulty on the open set questions (in particular, the open set questions that were lowercase letters). The closed set questions narrowed down the possible answer options to a set of four, whereas the open set questions required the children to retrieve the target letter from memory.

Overall, the children had the most difficulty with lowercase letters, which was to be expected based on the finding that children develop knowledge of uppercase letters first (Evans et al, 2006). On the screening device, all letters were uppercase and the only two uppercase letters missed on the TOPEL (“Y” and “L”), were not present on the screener. Even with the

difficulty with lowercase letters, the children all performed within the normal range for the letter identification subtest on the TOPEL.

In terms of rhyming, children that missed both rhyming words, also received the lowest scores on the TOPEL. This suggests that poor performance on the phonological awareness tasks of the TOPEL predicts poor performance on other phonological awareness measures (in this case, the rhyming subtest of the reading screener). Although the TOPEL assesses a larger variety of ages and thus has higher level phonological awareness tasks (elision and blending), the two children with difficulties in rhyming were identified. These findings also demonstrate the ability of the reading screener to quickly assess and identify children who have phonological awareness difficulty with age appropriate tasks (in this case, rhyming).

The use of a screening device to assess for phonological awareness difficulty is supported by the literature which asserts that by assessing rhyming in an early literacy screening device, knowledge of the child's early phonological awareness can be tested (Moyle et al., 2013). Rhyming is the most appropriate measure for this age range because children begin to recognize rhyming words by the age of three (Moyle et al., 2013). Children begin to focus on the parts of words through the use of rhyme and alliteration, which leads to the child's comprehension of those more difficult phonological awareness tasks (elision and blending) (Troia, 2014).

Establishment of Criterion Validity

Criterion validity was determined by comparing the participant's overall performance (pass or fail) on the reading screening device with their performance on the TOPEL, since this was the standardized literacy assessment selected. Criterion validity is the determination of how well one set of variables reflects a specific set of abilities. So in this case, the question was how

well could the reading screener predict difficulty or success on a standardized measure with established validity. Overall, data indicated that the reading screener has good criterion validity between the children's standard scores and their performance on the reading screener. The two children that ultimately failed the reading screener, based on our set cut-off scores, also had the lowest standardized scores on the CELF-P2 and lower scores on the TOPEL. Analysis of the finding will be discussed in the section to follow.

The CELF-P2 was selected to validate the reading screener due to its core language composite section (level 1, as previously discussed). The core language score is derived from three subtests; sentence structure, word structure, and expressive vocabulary. These three subtests cover the important language concepts of comprehension of sentences, morphology, and vocabulary and do so within 15 to 20 minutes of administration time. This information provided a clear and thorough overview of the child's language abilities to compare to the child's parental reported information.

The TOPEL was selected as well to validate the reading screener, due to its print awareness (letter identification) and phonological awareness sections in particular. The TOPEL includes three subtests; Subtest 1 is print knowledge, subtest 2 is definitional vocabulary, and subtest 3 is phonological awareness. The print knowledge subtest gave a solid overview of the child's current knowledge of written language, which included a section on letter recognition, as previously discussed. However, the TOPEL's phonological awareness subtest was found to be more appropriate for an older populations, as it assesses children's comprehension and use of elision and blending (higher level phonological awareness tasks). For this study's purposes, a simple rhyming and/or alliteration measure would have also been helpful.

Establishment of Appropriate Cut-Off Scores

As discussed in the literature, parents from lower-income homes may not spend as much time nurturing a literacy-rich environment and thus, may not be accurate predictors of their child's literacy level (National Education Association, 2014). The parents involved in our study, however, were predominantly working, middle class families associated with an urban University. It was found that they were aware of their child's literacy level and were able to provide important information that correlated strongly with the standardized literacy measures (Korat, 2011; Dickinson & DeTemple, 1998). Thus, the criteria for parental concerns was set at one or more noted concern due to the accurate representation this group of parents displayed regarding their children's early and current language and literacy skills. The children's CELF-P2 performances verified the parent's report of their children's abilities.

For the print awareness component of the screening device, the criteria was set at nine letters identified. Since our participants were five to six months into the VPK school year, the rationale for selecting the cut-off of nine letters was based on previous literature. Specifically, Piasta and colleagues (2012) indicated that pre-kindergarten children in publicly funded preschools can identify an average of eighteen uppercase letters and fifteen lowercase letters by the end of preschool. The children in this study had a high level of letter recognition, which could also be due to the finding that many literacy programs, such as the Reading First, Early Reading First, and Head Start, aim to improve children's letter knowledge and letter-sound correspondences (Piasta & Wagner, 2010). Emphasis is often placed on letter knowledge in VPK programs, which all of the participants from this study attend regularly. Hence, instructional emphasis cannot be overlooked in explaining the letter naming skill of these preschoolers.

For the phonological awareness component of the reading screening device, one rhyme out of two was sufficient to pass. This decision appeared appropriate in light of the strong relationship between one or two correct rhymes and an average standard score on the TOPEL. Had the sample size been larger in this study, the criteria for the rhyming component may have shifted based on the correlation of the children's standard scores on the TOPEL and the number of rhymes that correctly completed.

Utility of these Findings

Based on the findings of this pilot study, it can be concluded that this reading screener would be a beneficial tool for use in a pediatrician's office. The screening device proved to be easy to use, and sensitive in identifying children with possible reading difficulties. Once a larger sample is tested, the reading screener has the potential to be utilized by pediatricians for a quick and effective way to find the children in need for a full language and reading evaluation. Most importantly, the device can be used to find the children early, even prior to kindergarten entry. As discussed in the literature review, there are still children entering kindergarten that are not adequately prepared and are unlikely to catch up to their peers (Pelatti et al., 2014; Snow et al., 2014).

Study Strengths and Limitations

A major strength for this study was the tool used. The reading screening device was created through the collaboration of a pediatrician and speech-language pathologists with expertise in the diagnosis of early literacy disabilities. This process created a screening device that targeted appropriate areas and was also easy and quick to administer. Parents were able to answer the history questions effectively and the screener was simple to score and interpret.

Two specific study limitations may have affected study findings. The first limitation was the number of participants tested. Given the small sample size, the necessary correlational analyses needed to establish content and criterion validity with sufficient statistical rigor could not be conducted. In addition, this sample may not be representative of the general VPK population in that it consisted of children from predominantly middle-class families with parents either working at or attending a large, urban university. Therefore, the current sample may not reflect the socio-economic status typically seen in public schools. The potential bias in this sample also may explain the strong patterns of success noted by all children during letter naming.

Directions for Future Research

Future studies should expand the scope of participant recruitment to various preschool VPK programs, including those affiliated with and in the areas of renaissance schools. This specific school designation is given to schools in which almost the entirety of the students (90%) live below the poverty line. As discussed previously, children from low-income families are often at risk for literacy deficits and future literacy/language challenges. The inclusion of such participants should broaden the overall language level tested. It is also critical that future testing specifically include those children that are not currently in a VPK program, since these children may not be receiving adequate literacy experiences at home. Future studies should also require the training and utilization of the screening device by pediatricians, in order to determine their accuracy in administering and scoring the screener. This step is necessary before wide-spread use of the screening device can be encouraged.

References

- Berek, D. L. (2013). *Salem Press Encyclopedia: Phonemic Awareness*. Ipswich, MA: Salem Press.
- Bingham, G. E., & Patton-Terry, N. (2013). Early language and literacy achievement of early reading first students in kindergarten and 1st grade in the United States. *Journal of Research in Childhood Education, 27*, 440-453.
- Bishop, D. V., & McDonald, D. (2009). Identifying language impairment in children: Combining language test scores with parental report. *International Journal of Language & Communication Disorders, 44*, 600-615.
- Blair, R., & Savage, R. (2006). Name writing but not environmental print recognition is related to letter-sound knowledge and phonological awareness in pre-readers. *Reading and Writing, 19*, 991-1016.
- Boudreau, D. (2005). Use of a parent questionnaire in emergent and early literacy assessment of preschool children. *Language, Speech, & Hearing Services in Schools, 36*, 33-47.
- Bradford, H., & Wyse, D. (2012). Writing and writers: The perception of young children and their parents. *Early Years: An International Research Journal, 33*, 252-265.
- Cabell, S. Q., Justice, L. M., Konold, T. R., & McGinty, A. S. (2011). Profiles of emergent literacy skills among preschool children who are at risk for academic difficulties. *Early Childhood Research Quarterly, 26*, 1-14.
- Conti-Ramsden, G., Simkin, Z., & Pickles, A. (2006). Estimating familial loading in SLI: A comparison of direct assessment versus parental interview. *Journal of Speech, Language, and Hearing Research, 49*, 88-101.
- Culatta, B., & Hall, K. M. (2006). Phonological awareness instruction in early childhood settings. In L. M. Justice, *Clinical Approaches to Emergent Literacy Intervention* (pp. 179-223). San Diego: Plural Publishing.
- Diamond, K. E., & Baroody, A. E. (2013). Associations among name writing and alphabetic skills in prekindergarten and kindergarten children at risk of school failure. *Journal of Early Intervention, 35*, 20-39.
- Dickinson, D. K., & DeTemple, J. (1998). Putting parents in the picture: Maternal reports of preschoolers' literacy as a predictor of early reading. *Early Childhood Research Quarterly, 13*, 241-261.

- Education, U. D. (2006). *Fast Facts: Early Literacy Activities*. Retrieved August 2014, from National Center for Education Statistics: <https://nces.ed.gov/fastfacts/display.asp?id=56>
- Evans , M. A., Bell, M., Shaw, D., Moretti, S., & Page, J. (2006). Letter names, letter sounds and phonological awareness: An examination of kindergarten children across letters and of letters across children. *Reading and Writing, 19*, 959-989.
- Ezell, H. K., & Justice, L. M. (2005). *Shared Storybook Reading*. Baltimore, MD: Paul H. Brookes Publishing Co.
- Gillon, G. T. (2004). *Phonological Awareness: From Research to Practice*. New York: The Guilford Press.
- Hart, B., & Risley, R. T. (2003). The early catastrophe: The 30 million word gap by age 3. *American Educator, 27*, 4-9.
- Hempenstall, K. (2011, September). *Phonemic Awareness: What Does it Mean?* Retrieved from Education Oasis: http://www.educationoasis.com/resources/Articles/phonemic_awareness.htm
- Hilbert, D. D., & Eis, S. D. (2014). Early intervention for emergent literacy development in a collaborative community pre-kindergarten. *Early Childhood Education, 42*, 105-113.
- Hill, S. (2009). Oral language and beginning reading: Exploring connections and disconnections. *Forum on Public Policy, 2*, 1-13.
- Invernizzi , M., Landrum, T. J., Teichman, A., & Townsend, M. (2010). Increased implementation of emergent literacy screening in pre-kindergarten. *Early Childhood Education Journal, 37*, 437-446.
- Invernizzi , M., Sullivan, A., Meier, J., & Swank, L. (2004). *Phonological Awareness Literacy Screening PreK*. VA: University of Virginia.
- Justice, L. M. (2006). Emergent literacy: Development, domains, and intervention approaches. In L. M. Justice, *Clinical Approaches to Emergent Literacy Intervention* (pp. 3-27). San Diego, CA: Plural Publishing.
- Justice, L. M., Invernizzi, M. A., & Meier, J. D. (2002). Designing and implementing an early literacy screening protocol: Suggestions for the speech-language pathologist . *Language Speech and Hearing Services in Schools, 33*, 84-101.
- Justice, L. M., McGinty, A. S., Piasta, S. B., Kaderavek, J. N., & Fan, X. (2010). Print focused read-alouds in preschool classrooms: Intervention effectiveness and moderators of child outcomes. *Language, Speech, and Hearing Services in Schools, 41*, 504-520.
- Kantor, P. T., Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (2011). Comparing two forms of dynamic assessment and traditional assessment of preschool phonological awareness. *Journal of Learning Disabilities, 44*, 313-321.

- Kirby, J. R., & Parrila, R. K. (1991). Theory-based prediction of early reading. *Alberta Journal of Educational Research, 45*, 428-447.
- Korat, O. (2011). Mothers' and teachers' estimations of first graders' literacy level and their relation to the children's actual performance in different SES groups. *Education and Treatment of Children, 34*, 347-371.
- Lam, E. A., & McMaster, K. L. (2014). Predictors of responsiveness to early literacy intervention: A 10-year update. *Learning Disability Quarterly, 37*, 134-147.
- Lonigan, C. J., Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (2007). *Test of Preschool Early Literacy*. Austin, TX: PRO-ED.
- Lonigan, C. J., & Shanahan, T. (2009, January). *Executive Summary: Developing Early Literacy: Report of the National Literacy Panel*. Retrieved September 15, 2014, from Literacy Information and Communication Systems: <http://lincs.ed.gov/publications/pdf/NELPSummary.pdf>
- Moyle, M. J., Heilmann, J., & Berman, S. S. (2013). Assessment of early developing phonological awareness skills: A comparison of the preschool individual growth and development indicators and the phonological awareness and literacy screening–preK. *Early Education and Development, 24*, 668-686.
- National Center for Education Statistics. (2006). *Early Literacy Activities*. Retrieved June 2015, from National Center for Education Statistics : <https://nces.ed.gov/fastfacts/display.asp?id=56>
- National Education Association . (2014, September). *Facts About Children's Literacy*. Retrieved from National Education Association : <http://www.nea.org/grants/facts-about-childrens-literacy.html>
- Neumann, M. M., Hood, M., & Ford, R. M. (2013). Using environmental print to enhance emergent literacy and print motivation. *Reading & Writing, 26*, 771-793.
- Ouelette, G. P., & Haley, A. (2013). One complicated extended family: The influence of alphabetic knowledge on phonemic awareness. *Journal of Research in Reading, 36*, 29-41.
- Pelatti, C. Y., Justice, L. M., Pentimonti, J. M., & Schmitt, M. B. (2014). Fostering children's emergent literacy development: The role of family practices. In E. R. Silliman, C. A. Stone, B. J. Ehren, & G. P. Wallach, *Handbook of Language and Literacy: Development and Disorders* (pp. 190-203). New York : Guilford Press.
- Piasta, S. B., Purpura, D. J., & Wagner, R. K. (2010). Fostering alphabet knowledge development: A comparison of two instructional approaches. *Reading & Writing, 23*, 607-626.

- Piasta, S. B., & Wagner, R. K. (2010). Learning letter names and sounds: Effects of instruction, letter type, and phonological processing skill. *Journal of Experimental Child Psychology, 105*, 324-344.
- Piasta, S. B., Yaacov, P., & Justice, L. M. (2012). How many letters should preschoolers in public programs know? The diagnostic efficiency of various preschool letter-naming benchmarks for predicting first-grade literacy achievement. *Journal of Educational Psychology, 104*, 945-958.
- Puolakanaho, A., Ahonen, T., Aro, M., Eklund, K., & Leppanen, P. H. (2007). Very early phonological and language skills: Estimating individual risk of reading disability. *The Journal of Child Psychology and Psychiatry, 48*, 923-931.
- Puranik, C. S., & Lonigan, C. J. (2009). From scribbles to scrabble: Preschool children's developing knowledge of written language. *Reading and Writing, 24*, 567-589.
- Puranik, C. S., & Lonigan, C. J. (2012). Name-writing proficiency, not length of name, is associated with preschool children's emergent literacy skills. *Early Childhood Research Quarterly, 27*, 284-294.
- Sawyer, W. E. (2004). *Growing Up with Literature*. Clifton Park, NY: Thomson Delmar Learning.
- Scarborough, H. S. (2005). Developmental relationships between language and reading: Reconciling a beautiful hypothesis with some ugly facts. In H. W. Catts, & A. G. Kamhi, *The Connections Between Language and Reading Disabilities* (pp. 3-24). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Scott, V. G. (2009). *Phonemic Awareness*. Thousand Oaks, CA: Corwin.
- Semel, E., Wiig, H. E., & Secord, W. A. (2004). *Clinical Evaluation of Language Fundamentals-Preschool-2*. San Antonio, TX: Pearson.
- Snow, P. C., Eadie, P. A., Connell, J., Dalheim, B., McCusker, H. J., & Munro, J. K. (2014). Oral language supports early literacy: A pilot cluster randomized trial in disadvantaged schools. *International Journal of Speech-Language Pathology, 16*, 495-506.
- Stewart, S. R., & Lovelace, S. M. (2006). Recruiting children's attention to print during shared reading. In L. M. Justice, *Clinical Approaches to Emergent Literacy Intervention* (pp. 327-359). San Diego, CA: Plural Publishing.
- Torgesen, J. K., & Mathes, P. G. (1998). *What Every Teacher Should Know About Phonological Awareness*. Retrieved September 15, 2014, from Florida Department of Education: <http://www.fl DOE.org/ese/pdf/phon9872.pdf>
- Tridas, E. (2014). *Reading Screener-Entering Kindergarten*. Tampa, FL: Author.

- Troia, G. A. (2014). Phonological processing deficits and literacy learning. In A. C. Stone, E. R. Silliman, B. J. Ehren, & G. P. Wallach, *Handbook of Language and Literacy: Development and Disorders* (pp. 227-241). New York : Guilford Press.
- U.S. Department of Education. (2014, September). *Programs: Early Reading First*. Retrieved from U.S. Department of Education:
<http://www2.ed.gov/programs/earlyreading/index.html>
- Ukrainetz, T. A. (2006). Using emergent writing to develop phonemic awareness. In L. M. Justice, *Clinical Approaches to Emergent Literacy Intervention* (pp. 225-259). San Diego: Plural Publishing.
- University of Oregon Center on Teaching and Learning. (2014, September). *Big Ideas in Beginning Reading*. Retrieved from University of Oregon Center on Teaching and Learning: <http://reading.uoregon.edu/>
- Vera, D. (2011). Using popular culture print to increase emergent literacy skills in one high-poverty urban school district. *Journal of Childhood Literacy*, 11, 306-330.
- Weitzman, E., Girolametto, L., & Greenberg, J. (2006). Adult responsiveness as a critical intervention mechanism for emergent literacy: Strategies for preschool educators. In L. M. Justice, *Clinical Approaches to Emergent Literacy Intervention* (pp. 127-177). San Diego, CA: Plural Publishing.
- Wilson, S. B., & Lonigan, C. J. (2009). Identifying pre-school children at risk of later reading difficulties: Evaluation of two emergent literacy screening tools. *Journal of Learning Disabilities*, 43, 62-76.
- Yang, H.-C., & Noel, A. M. (2006). The developmental characteristics of four- and five-year-old pre-schoolers' drawing: An analysis of scribbles, placement patterns, emergent writing, and name writing in archived spontaneous drawing samples. *Journal of Early Childhood Literacy*, 6, 145-162.
- Zucker, T. A., Ward, A. E., & Justice, L. M. (2009, September). Print referencing during read-alouds: A technique for increasing emergent readers' print knowledge. *The Reading Teacher*, 63, 62-72.

Appendix A

Kindergarten Reading Screening Protocol (Tridas, 2014)

Reading Screening – Entering Kindergarten

NAME _____ AGE _____ DATE _____

HISTORY SCREENING *(use at the school physical visit)*

- | | Yes | No |
|---|--------------------------|--------------------------|
| I. Infancy | | |
| <i>Did your child...</i> | | |
| • Say single words by 18 months <i>(ex. drink, juice, mommy)?</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Understand 250 words by 18 months? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Speak in 2-3 word phrases by 2 years <i>(ex. go car, want cookie)?</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| II. While enrolled in the 4 y/o voluntary prekindergarten (VPK) | | |
| <i>Did your child...</i> | | |
| • Eliminate sounds from words <i>(chi-en for chicken, -at for cat, ju- for juice) ?</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Could your child...</i> | | |
| • Recite simple nursery rhymes <i>(ex. Humpty Dumpty)?</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Identify words that rhyme with each other <i>(ex. run/fun)?</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Name at least 10 upper case letters <i>(ex. A, K, S... not a, k, s)</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Identify the letters in his/her own name? | <input type="checkbox"/> | <input type="checkbox"/> |
| III. Is there a family history of language and/or reading problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a concern about your child's reading abilities? | <input type="checkbox"/> | <input type="checkbox"/> |
| IV. Clinician's concern | <input type="checkbox"/> | <input type="checkbox"/> |

History Total

SCREENING TEST

- | | | | |
|---|-----------------------|----------------------------------|-----------------------|
| I. Alphabetic principle <i>(use following words for letter naming)</i> | | | |
| ▪ GUV (3) ▪ NID (3) ▪ STEB (4) ▪ FRAS (4) | | | |
| • Names UPPER CASE letters | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| II. Rhyming | | | |
| • Say a word that rhymes with cat. | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| • Say word that rhymes with run. | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| III. Clinician's Concern | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| IV. Hearing Screening | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |

Screening Total

OVERALL SCORE

P F

Appendix B

Email Consent for the Use of the Kindergarten Reading Screening Protocol (Tridas, 2014)

From: Eric Tridas [mailto:eric.tridas@thetridascenter.com]
Sent: Thursday, August 6, 2015 12:04 PM
To: Bahr, Ruth <rbahr@usf.edu>
Subject: Pre-K Reading Screening
Importance: High

Dear Dr. Bahr,

As you requested, I am emailing you to confirm that I agree to let you, Ruth Bahr and Erika Blue use the Pre-K Reading Screening device for her thesis, "Validity Testing of a Preschool Reading Screening Device for Pediatricians". Please let me know if I can be of any further help.

Sincerely,

Eric Tridas

Eric Q. Tridas, M.D.
Director and Developmental Pediatrician
The Tridas Center for Child Development
4144 North Armenia Avenue
Suite 375
Tampa, FL 33607
Tel. 813-876-8316
Fax. 813-875-4011
eric.tridas@thetridascenter.com
www.thetridascenter.com

Appendix C

University of South Florida Institutional Review Board Approval

12/18/2014

Ruth Bahr, PhD USF Communication
Sciences and Disorders 4202 E. Fowler
Ave. PCD1017 Tampa, FL 33620

RE: Expedited Approval for
Initial Review
IRB#: Pro00019930
Title: Reading Screener for
Pediatricians

Study Approval Period: 12/17/2014 to 12/17/2015

Dear Dr. Bahr: On 12/17/2014, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below.

Approved Item(s):

Protocol Document(s):

Development of a Reading Screener for
Pediatricians.docx

Consent/Assent Document(s)*:

Parental consent form. Pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

Research Involving Children as Subjects (45 CFR §46.404)

Per CFR 45 Part 46, Subpart D, this research involving children was approved under the minimal risk category 45 CFR 46.404: Research not involving greater than minimal risk.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR

56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research.

Sincerely,
Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board