Evaluation of an early literacy monitoring tool for at-risk readers

Andrea L. Glesser

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Evaluation of an Early Literacy Monitoring Tool for At-Risk Readers

by

Andrea L. Glessner

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__________________________________________
Joan N. Kaderavek, Ph.D., Committee Chair

__________________________________________
Laurie Dinnebeil, Ph.D., Committee Member

__________________________________________
William McInerney, Ph.D., Committee Member

__________________________________________
Noela Haughton, Ph.D., Committee Member

__________________________________________
Patricia Komuniecki, Ph.D., Dean
College of Graduate Studies

The University of Toledo

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This study provided a preliminary analysis of concurrent and discriminative validity for the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009). Sixty preschool students between the ages of 3 years, 6 months and 5 years of age, from early childhood programs in Northwest Ohio, participated in the study. The students were assigned to one of two groups based on the presence of identified language impairments.

Concurrent validity measures were established by assessing the participants with the ELP-MAT and two well-established norm-referenced measures, the *Test of Early Reading Ability, Third Edition* (TERA-3; Reid et al., 2001), and the *Test of Preschool Early Literacy* (TOPEL; Lonigan et al., 2007) phonological awareness (PA) subtests. Data demonstrated that there were substantial positive correlations between the overall raw scores on the ELP-MAT and TERA-3 as well as between individual ELP-MAT and TERA-3 subtests. A substantial positive correlation was also present between the ELP-MAT phonological awareness domain and the TOPEL PA subtests.
Discriminative validity for the ELP-MAT was established using an independent t-test to compare the group means of the typically developing students to those of the language impaired students. Data analysis indicated significant differences in all domains, demonstrating that the ELP-MAT is able to effectively differentiate typically developing children from those with language impairments. Results of this early study suggest that the ELP-MAT demonstrates strong psychometric properties with respect to concurrent and discriminative validity. The results are encouraging, suggesting that the ELP-MAT is a valid progress-monitoring tool, worthy of further research for use in early childhood settings.
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Chapter One

Statement of the Problem

Emergent Literacy

Development of literacy skills in preschoolers has been the focus of intense attention and research over the past decade. It was once believed that children could not “learn to read” until they reached certain developmental milestones or were “ready” developmentally. Experts who proposed this “reading readiness” approach believed that children needed to master specific skills prior to beginning formal reading instruction (Whitehurst & Lonigan, 1998). In contrast to a reading readiness approach, many educators now support an “emergent literacy” perspective. Emergent literacy refers to any and all valued experiences, skills, and behaviors related to reading and writing prior to a child’s ability to read conventionally. Many definitions of emergent literacy exist. However, Whitehurst and Lonigan define emergent literacy as the skills, knowledge, and attitudes that precede the traditional forms of reading and writing. Emergent literacy also considers children’s literacy environment (Lonigan, 1994; Sulzby, 1989; Sulzby & Teale, 1991).

Emergent literacy skills are an important precursor to conventional literacy development, as emergent literacy forms the foundation for conventional literacy (Lonigan, Burgess, & Anthony, 2000). Educators now agree that literacy development begins long before children enter school (Bodrova, Leong, & Paynter, 1999) and that all children regardless of ability level should be exposed to foundational literacy experiences
during the early childhood years. Research has consistently demonstrated that literacy skills are crucial for a successful academic experience, providing further justification for the current focus on children’s emergent literacy development.

Learning to read does not happen “on its own.” Literacy development must be fostered by high-quality experiences and instruction (Bodrova et al., 1999). Children’s early experiences can vary widely in terms of frequency, environments, and quality (Schuele, Roberts, Fitzgerald, & Moore, 1993). Children’s literacy growth is fostered when children observe adults using print both for enjoyment (i.e. reading a book or magazine) or when observing an adult read and write during daily activities (i.e. reading a map). In optimal literacy learning environments, children are read to, exposed to environmental print, and given opportunities to play with print from infancy. When children participate in high quality literacy experiences, they are provided with a foundation for successful acquisition of conventional reading skills.

Children’s emergent literacy skills are generally subdivided into several components; the components are strongly correlated with children’s later conventional literacy abilities (Justice, 2006, National Early Literacy Panel [NELP], 2004). Emergent literacy components include: alphabet knowledge, concepts about print, phonological awareness, invented spelling, oral language, and name writing. NELP organized the six skills into four overarching domains: print knowledge, phonological awareness, writing, and oral language. The domains and critical skill areas are shown in Figure 1. It is important to note, however, that the domains are not simply skills children acquire, but also include experiences and activities fostered at home, school, or in the community; underscoring the point that rather than waiting for a child to be “ready” to learn to read
(as was done in the past), children should be exposed to a variety of emergent literacy concepts throughout the early childhood years to assist with preliteracy acquisition. Children who have been exposed to frequent, high-quality emergent literacy experiences often demonstrate higher reading and writing skills during the elementary school years (Bodrova et al., 1999; Morris, Bloodgood, Lomax, & Perney, 2003).

**Figure 1.** Key emergent literacy domains and critical skills within each domain.

Adapted from Justice, 2006
National legislation mandates reading proficiency for all children. Reading proficiency is defined as the ability of children to meet grade-level expectations for annual achievement based on state mandated assessments (No Child Left Behind [NCLB], 2001). As a result, major educational agencies and organizations carefully consider the quality of their early literacy instructional programs during early childhood (Phillips, Clancy-Menchetti, & Lonigan, 2008). Beginning “reading instruction” during the preschool years may seem counterintuitive to some people. However, early reading and writing abilities are linked to later reading proficiency. Learning about letters, sounds, print, pictures, words, and sentences are all prerequisites to reading (Bodrova et al., 1999). Children with frequent exposure to crucial skills are more likely to experience reading success. These experiences should be meaningful and naturalistic throughout the child’s day (Justice & Kaderavek, 2004).

**Response to Intervention (RTI)**

While we know that exposure to quality early literacy experiences is important in attaining emergent literacy skills, how do we know which children are developing critical early literacy skills? In addition, what happens when an educator determines that a child is not developing critical literacy skills? The answers to these questions lie in an approach termed “**Response to Intervention (RTI)**.” RTI focuses on providing a united system of education, to improve results for all students (Ohio Department of Education [ODE], 2008). Response to intervention is an educational process used to identify children who fail to meet curriculum standards.

The RTI approach mandates a school-wide screening/assessment of children, followed by a three-tiered approach to interventions based on increasing levels of
intensity. Further, RTI mandates that children’s educational progress must be monitored throughout the learning process. By monitoring children’s progress, educators are able to determine whether ongoing interventions are effective or if additional modifications or supports are required to assist students to reach curriculum goals.

As with many other conceptual and theoretical changes in the educational system, RTI approaches are trickling down to the early childhood or preschool level. Use of RTI at the preschool level addresses the unique needs of all children. The goal of RTI is to ensure that all students receive high quality instruction, with intervention implemented for children who “fall behind” compared to their peer group. The intervention is matched to student’s individual needs based on the level of intensity and academic deficit. Educators who implement the RTI model believe that all children can learn when provided high quality instruction. However a critical component of RTI centers on systematically reviewing child data to identify children who may be falling behind. Decisions on intervention placement are determined by performance data and tracked through frequent progress monitoring (ODE, 2008). Once performance data is collected, student progress is continually monitored to assess the effectiveness of instruction and intervention.

The process of RTI reflects a major shift in the field of education (Bowers, 2008). In the past children were simply identified as not progressing through the curriculum as expected, referred for special education assessments, tested, diagnosed, and placed in special education programs, if eligible. In contrast to this past approach, RTI ensures that children are not “singled out” based on a lack of skill mastery or lack of experience with a concept. With RTI, all children are provided with scientific, research-based, high-
quality intervention within their regular classroom program at the Tier I level (Burns & Coolong-Chaffin, 2006). Children who need more individualized intervention move through to Tier II and Tier III levels of intervention (detailed information about the RTI “tiers of intervention” is described in Chapter 2). As children’s skills improve, children move back to the Tier I level of instruction. This shift reflects a change in both state and federal special education law, mandating that districts adopt and implement processes and procedures for RTI prior to initiating a referral for a special education evaluation (Bowers).

Response to intervention links the fields of general and special education, as children move along hierarchy levels of intervention as compared to the “pull out” programs utilized in the past (Burns & Coolong-Chaffin, 2006). Use of RTI in early childhood ensures that all children are provided high quality learning opportunities and experiences without over referral to special education. Instituting a RTI process within the preschool setting is a feasible and promising option, as long as there are appropriate tools for assessment/screening, intervention, and progress monitoring.

**Assessment Tools and Progress Monitoring**

In order to effectively utilize a RTI model in the area of emergent literacy, teachers need to have appropriate assessment tools to identify at-risk students and monitor student progress. If educators and other professionals accurately assess emergent literacy skills, children’s strengths and weaknesses are identified at early stages. Identifying weaknesses allows educators to implement interventions to target specific components of literacy learning.
There are several commercially developed assessment tools available to assess early literacy skills (currently available instruments are discussed in detail in Chapter 2). However, although established tools exist, experts identify weaknesses in their use as progress monitoring assessments (Greenwood, Luze, & Carta, 2002; Walker, Carta, Greenwood, & Buzhardt, 2008). A primary concern is that current measures are not adequately aligned with the theoretical position underlying the RTI model. Current tools typically do not elicit information deemed useful for intervention development, one of the major components of RTI (Bagnato & Neisworth, 1991; Greenwood et al.). In the past, assessment and intervention have been treated as separate components of the educational process; however, RTI prescribes that initial assessment and ongoing progress monitoring should be unified (Meisels, 1996).

There are other concerns regarding commercially developed instruments. Commercial assessments or evaluations are typically completed with a child in a structured setting, one-on-one with an adult specifically trained in their use and interpretation. An assessment of this type is generally administered outside the classroom and represents a standardized, norm-referenced tool assessing a discrete subset of skills.

Norm-referenced assessment statistically compares a child’s performance to his or her same-age peers, thus they are typically used for diagnostic purposes. Norms are established during test development by determining the average scores for the children at each age level. Norming standards create restrictions on the use of the tool regarding the frequency in which they may be used (i.e. generally once every 12 months.). The
standards also specify exact instructions, prompts, and responses, which must be elicited in order to give a child credit for an item (Bowers, 2008).

Norm-referenced assessments do not reflect a “natural” assessment, replicating a child’s performance in everyday classroom settings. Many children at the preschool level have had very little experience with norm-referenced tests and are often unsure how to behave or respond in the testing situation. Further, extraneous factors (i.e. mood, sickness, lack of sleep) can negatively influence the child’s performance on norm-referenced evaluations.

It can be challenging for educators to interpret data from standardized, norm-referenced tests. Results from the test must be considered in comparison to similar children in similar circumstances. Unfortunately, often norming samples do not adequately represent minorities or children with special needs (McAfee & Leong, 2007). Norm-referenced assessments are generally not recommended for intervention development, progress monitoring, or ongoing evaluation (Bowers, 2008; McConnell, 2000).

Early childhood professionals are moving away from traditional norm-referenced testing methods and are increasingly relying on assessments deemed more developmentally appropriate and useful for instructional planning. The National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE) recommend that educators utilize criterion-referenced assessment instruments as an alternative to standardized, norm-referenced tests (Greenwood et al., 2002; National Association for the Education of Young Children [NAEYC], 2004). Criterion-referenced
assessments can be easily interpreted to assist in intervention decision making and classroom instructional planning. When criterion-referenced assessments are administered correctly, they are valid and reliable.

Criterion-based assessments compare a child’s performance to a predetermined set of skills or behaviors (the criterion) to determine strengths and weaknesses. By focusing on a child’s patterns of strengths and weaknesses, educators can individualize classroom instruction and intervention. While there are many criterion-based tools specifically developed for use in early childhood settings, some criterion-referenced assessments lack authenticity and do not align with early childhood teaching and learning practices (Bergholm-Petka & Pipkin, 2008; Greenwood et al., 2008; NAEYC, 2004). In this chapter (see below), several criterion-referenced emergent literacy assessments (including their weaknesses) are briefly discussed; these assessments will be described in detail in Chapter 2.

In early childhood programs, the primary progress-monitoring assessment protocols used to assess emergent literacy skills are (a) the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Moats, Good & Kaminski, 2003) and (b) the Get It! Got It! Go! (GGG; Missall & McConnell, 2004). The DIBELS and GGG are individually administered, criterion-referenced assessments to measure early reading skills. The DIBELS was originally developed for children in kindergarten and above, but now has measures at the preschool level for word fluency and initial sound fluency. The GGG is designed for children ages 3-5 years, to measure expressive vocabulary and phonological awareness (McConnell, 2008; Walker et al., 2008).
Researchers and educators express four major concerns regarding the use of the DIBELS and the GGG in early childhood settings. First, DIBELS and GGG are not contextually relevant, meaning they are not reflective of everyday classroom experiences and routines (Nichols, & Berliner, 2005; Nichols, Glass, Berliner, 2005; Snyder, Wixson, Talapatra, & Roach, 2008). This is a challenge, as many young children perform better in relevant situations where learning is contextualized. Second, experts have questioned the validity of short, timed measures, such as those utilized in the DIBELS and GGG to assess children’s performance. Both assessments rely on accuracy and speed to monitor literacy development (Elliott, Lee, & Tollefson, 2001). Third, experts question whether the DIBELS and GGG predict children’s reading ability and comprehension of authentic literacy materials (Kamii & Manning, 2005; Schilling, Carlisle, Scott, & Zeng, 2004; Shelton, Altwerger, & Jordan, 2009). Fourth, educators find it difficult to interpret children’s scores on the DIBELS and GGG; weak interpretation limits their usefulness for instructional planning and progress monitoring (Office of Early Learning & School Readiness [OELSR], 2008; Shilling et al.).

In summary, the focus on emergent literacy and the RTI model has made it imperative to have high-quality assessment tools to monitor children’s early literacy skills. Justice, Invernizzi, and Meier (2002) recommend that effective emergent literacy assessments be: (a) broad based, (b) sensitive, (c) easy and efficient to administer, and (d) provide outcomes that are easily interpreted by educators. In the following chapters, current literature is provided to describe components of assessment (i.e., reliability and validity) and the impact of assessment within the “Response to Intervention” process.
The literature review demonstrates the need for a more reliable, valid, and authentic tool to assess and monitor the emergent literacy skills and progress of preschool children.

**Objectives of the Current Study**

The current study aims to establish a preliminary measure of validity for a new progress monitoring assessment tool in the field of emergent literacy. The tool is the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009), an assessment that is being evaluated and revised. The ELP-MAT is designed to be a contextually and developmentally appropriate early literacy progress monitoring assessment tool. The purpose of the ELP-MAT is to (a) identify at-risk children during their preschool years to provide early intervention and (b) monitor young children’s emergent literacy development (Kaderavek). With the availability of an authentic assessment and progress-monitoring tool, early childhood educators will be able to effectively engage in the RTI process.

The goal of the current study is to provide preliminary evidence that the ELP-MAT is an appropriate tool to screen children and identify preschool children who are not developing age-appropriate emergent literacy skills. In order to determine that the ELP-MAT is a tool worthy of use in early childhood settings, certain parameters must be explored. Specifically, in order to be used in early childhood classrooms, a new tool must have documented validity and reliability. It goes without saying that in order to have a sound tool, one must first investigate the psychometric properties of the tool.

In order to establish psychometric qualities of the ELP-MAT, multiple measures of validity and reliability must be established. The current study focuses on documenting the tool’s concurrent and discriminative validity. Concurrent validity is an essential
category of validity evidence, establishing that the variables measured in one tool (the ELP-MAT) are consistent with known and previously tested variables. The strength and direction of the relationship between the measure of interest (the ELP-MAT) and an external, or criterion, variable is generally measured via a correlational study (Hinkle, Wiersma, & Jurs, 2003). In addition to establishing correlations among variables, validity also refers to a measure’s ability to differentiate between groups that it should theoretically be able to distinguish between (typically developing children and children with language impairments). This is referred to as discriminative validity, as the measure should be able to “discriminate” between the groups.

The current study documents the ELP-MAT’s concurrent validity by comparing children’s performance on the ELP-MAT with their performance on (a) the Test of Early Reading Ability- 3rd Edition (TERA-3; Reid, Hresko, & Hammill, 2001) and (b) the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, & Torgesen, 2007). Since the TERA-3 does not include a measure of phonological awareness, the TOPEL phonological awareness subtest was used to measure the construct of phonological awareness.

The Test of Early Reading Ability-3 is an assessment tool with strong psychometric properties, designed to measure early literacy skills of children ages 3 year 6 months to 8 years 6 months of age. The TERA-3 correlates well with other tests of reading, intelligence, language, and achievement (Reid et al., 2003). Additionally, the TERA-3 has high internal-consistency reliability coefficients and test-retest reliability coefficients. Through comparison of children’s scores on the ELP-MAT and the TERA-3, one source of preliminary validity evidence, concurrent validity, will be established via a correlation coefficient.
The Test of Preschool Early Literacy is an assessment instrument designed to measure early literacy abilities in children ages 3 years to 5 years of age. The TOPEL was chosen for this study to supplement the TERA-3 to include a measure of phonological awareness. Measuring phonological awareness when studying early literacy skills is imperative, as multiple multivariate longitudinal studies as well as the findings of the National Early Literacy Panel (NELP) support the importance of phonological awareness in the development of reading skills (Snow, Burns, & Griffin, 2006; Whitehurst & Lonigan, 1998).

The TOPEL is a rigorously evaluated early literacy tool and is considered a valid and reliable measure of early literacy abilities, it is a tool that can be used with confidence to assess young children (Lonigan et al., 2007). The TOPEL evaluates both simple and complex phonological skills (McDowell, Lonigan, & Goldstein, 2007). Through comparison of children’s scores on the ELP-MAT and the TOPEL phonological awareness subtest, preliminary concurrent validity evidence will be established via a correlation coefficient.

Prior to the initiation of the study, the researcher hypothesized high concurrent validity between children’s scores on the ELP-MAT and his/her scores on TERA-3 and TOPEL phonological awareness subtest. A high correlation would provide preliminary support that the ELP-MAT is a valid tool for assessment of emergent literacy skills (Goodwin & Leech, 2003).

The current study also aims to demonstrate the tool’s discriminative validity by documenting the ability of the ELP-MAT to differentiate between children who have known risk factors for successful literacy acquisition (i.e. language impairments) and
those who are typically developing. Investigation into these two components of validity parameters results in the following research questions.

1. Are children’s scores on the Early Literacy Progress Monitoring Assessment Tool (ELP-MAT) significantly related to his/her scores on the Test of Early Reading Ability, Third Edition (TERA-3)?

2. Are children’s scores on the phonological awareness subtest of the ELP-MAT significantly related to his/her scores on the phonological awareness (PA) subtest of the Test of Preschool Early Literacy (TOPEL)?

3. Do scores on the ELP-MAT differentiate between two groups of children, those with diagnosed language impairments and those who are typically developing?
Chapter Two

Literature Review

The review summarizes the pertinent literature and current research related to emergent literacy and its importance during the preschool years. Additionally, the importance of the *response to intervention* (RTI) process and the roles of assessment and progress monitoring in the RTI process in early childhood settings are discussed. During the course of the review, children’s typical emergent literacy development and skills are reviewed as well as the variation in development commonly associated with children presenting with speech or language impairments. In addition, the value of assessment as a tool for identifying children at-risk for later reading difficulties is summarized. This summary encompasses the role of assessment, intervention, and progress monitoring in emergent literacy.

Various types of assessments are examined and components of each explored, including limitations of the primary tools currently used to assess emergent literacy. The steps involved in test construction are explored in response to the need for a novel assessment tool in the area of emergent literacy. Finally, a novel assessment instrument is proposed to identify at-risk children and to monitor children’s emergent literacy progress in authentic settings.

**Emergent Literacy**

Several components are directly linked to children’s literacy development. These components are termed “emergent literacy” skills and are described throughout the
literature on early reading and emerging literacy. Children who are raised in literate environments often begin to explore literacy through scribbling, looking at storybooks, and playing with the sounds of language as early as one year of age. These explorations are all suggestive of early forms of emergent literacy (Snow et al., 1998).

Conventional literacy is defined as reading and writing according to the rule-governed alphabetic system. However, many children engage in literacy-related activities prior to emergence of conventional literacy acquisition. Justice (2006) stated that emergent literacy represents a genuine and significant period in children’s achievement of literacy. During this stage, some of the following behaviors may be observed: interest in print, pretending to read familiar books, scribbling and producing other “writings,” exploring the sounds of language (i.e. silly rhymes), and using literacy tools in dramatic play (e.g., using the telephone). While many adults view these behaviors as typical “play” activities of children, the behaviors listed above demonstrate exploration of early literacy skills.

Emergent literacy is comprised of any and all valued experiences, skills, and behaviors related to reading and writing, some early literacy skills emerging in infancy. Many definitions of emergent literacy exist, but Whitehurst and Lonigan (1998) defined emergent literacy as the skills, knowledge, and attitudes that are precursors to more traditional forms of reading and writing and the environments in which these components take place (Lonigan, 1994; Sulzby, 1989; Sulzby & Teale, 1991). Emergent literacy skills have been pinpointed as important precursors to literacy development (Lonigan et al., 2000). The emergent literacy approach advocates the need for quality literacy experiences in early childhood including instruction, assessment, and intervention.
Educators now agree that literacy development begins long before children enter school and that all children regardless of ability level should be exposed to these skills during the early childhood years (Bodrova et al., 1999). Research has consistently demonstrated that literacy skills are crucial for a successful academic experience, further justifying the emphasis on emergent literacy.

The 2004 National Early Literacy Panel (National Early Literacy Panel [NELP], 2004) identified six skills that are strongly correlated with conventional literacy development. These include: alphabet knowledge, concepts about print, phonological awareness, invented spelling, oral language, and name writing. NELP organized these six skills into four key domains: (a) oral language, (b) phonological awareness, (c) print knowledge (including alphabet knowledge), and (d) writing.

The four domains, which will be discussed in depth throughout this paper, have significant interrelationships with one another and strongly influence children’s reading success. Due to the impact of these skills on conventional literacy development, educators must identify and assess these key domains during the emergent literacy period. By developing a thorough understanding of the key domains and skills involved in emergent literacy, educators can focus on the early literacy concepts essential for future literacy success. Further, informed teachers can monitor at-risk children’s development and provide appropriate interventions (Cabell, Justice, Zucker, & McGinty, 2009).

**Oral Language**

Oral language is an essential area of emergent literacy development. Being able to express oneself not only affects communication skills, but also impacts an individual’s
cognitive skills, interactions with others, and general academic achievement. Children with communication delays are at-risk for difficulties in literacy development. Kaderavek and Sulzby (1999) reported that learning to speak and read are reciprocal skills, since children demonstrate early literacy knowledge through oral language use.

Whitehurst and Lonigan (1998) described emergent literacy as a developmental continuum, with significant links between language and literacy. Vocabulary, a key component in oral language, is one of the earliest developments in emergent literacy acquisition and comprehension.

Reading involves translating symbols or letters into corresponding sounds. When a child learns to read, he or she must put sounds together in order to decode a word. For example, a child learning to read may attempt to sound out a word by segmenting the sounds /h/, /a/, /t/. After sounding out the word, in order to understand what the word means, a child must have prior knowledge of the particular word. Understanding the meaning of a word is referred to as semantic representation. If children do not know what a “hat” is, even though they can successfully segment and blend the sounds into a word, they will not comprehend the word. Children must be able to extract meaning from a word in order to be successful readers and writers. Without the word’s semantic representation, decoding strategies are fruitless. In the example above, the linkage between the letter sounds and word meaning is demonstrated.

Oral language skills in early childhood are linked to children’s later reading proficiency. Many longitudinal studies document relationships between oral language and reading (Catts, Fey, Tomblin, & Zhang, 2002). Children with language delay are at increased risk for later reading and writing difficulties (Catts et al.). Because of the
relationship between oral language and reading development, it is important to investigate the link between children with language impairments and patterns of literacy acquisition.

The National Reading Panel (National Reading Panel [NRP], 2000) suggests that children who engage in frequent communication with adults and participate in meaningful conversation and interactions are advantaged as compared to children who do not experience frequent adult-child interaction. It is critical for children to have exposure to language-rich environments to facilitate development of language and literacy skills. Experiences with adults and peers who foster oral language skills, teach new vocabulary, play with sounds and words, expand on verbalizations, and encourage children to use language to problem solve and express their ideas positively impacts children’s literacy development (Dixon, 2008). Longitudinal studies have documented that children’s knowledge of the structure of language and meaning of words (syntax and vocabulary) in kindergarten predicts later reading performance and reliably discriminates between successful and struggling readers. Accordingly, experts agree that individual differences in oral language impact children’s later reading development (Harlaar, Hayiou-Thomas, Dale, & Plomin, 2008).

**Phonological Awareness**

Phonological awareness is a major component of emergent literacy, given that it has been shown to be a primary precursor to early reading achievement (Ukrainetz, 2006). Phonological awareness (PA) is the ability to detect and manipulate the sound structure, or phonological components of words (Kaminski & Good, 1996; Phillips et al., 2008). PA is related to reading achievement, as phonological sensitivity has been found
to be predictive of and causally related to conventional reading ability and significantly predict children’s reading decoding skills (Ehri et al., 2001; Lonigan et al., 2000). Studies by Adams; Byrne and Felding-Barnsley; Sanovich; and Wagner and Torgesen (as cited in Lonigan et al., 2000; also Hogan, Catts, & Little, 2005) reported that phonological sensitivity is critical for the typical attainment of proficient reading skills and that deficits in PA have been associated with reading disabilities.

Phonemic awareness builds from oral language and often begins during the preschool years. There are significant concurrent and longitudinal correlations between phonological awareness and children’s vocabulary skills (Bishop & Adams, 1990; Kaminski & Good, 1996; Lonigan et al., 2000). As children build phonemic awareness skills they become aware of and able to analyze the sound structure of words and learn to segment and manipulate the sounds of speech. When children develop their PA abilities, they begin by isolating phonemes. Many children are capable of identifying individual sounds during the early preschool years. For example, a child may be able to indicate that *dog* begins with the /d/ sound.

Many children enter this first PA phase with the ability to produce the sound of the first letter of their name. Next, children often move into matching phonemes, which is a more difficult skill. At this level, a child is able to indicate that *dog* and *doll* begin with the same sound. Typically, the next step for children is phoneme blending. During the blending phase, children are able to blend the isolated sounds of a word together to produce a complete word (i.e. /d/-/o/-/g/ says *dog*). Finally, phoneme segmenting, the most difficult skill, refers to breaking a word down into individual sounds (i.e. the sounds in *dog* are /d/-/o/-/g/). Children use phoneme segmenting when an adult instructs them to
“sound out” a word. Each of these phonological awareness skills is essential to emergent literacy, as the skills directly relate to conventional reading and spelling. It has been reported that children who are better at manipulating the sound structures of words, learn to read more quickly and competently (Kaminski & Good, 2006; Lonigan et al., 2000; Ukrainetz, 2006; Whitehurst & Lonigan, 1998).

Morris et al. (2003) indicated that phonemic awareness is the most researched area of early literacy. They reported that extensive correlational studies exist, establishing strong positive, interactive, and reciprocal relationships between phonological awareness in young children and reading ability. Mastering PA skills fosters reading success, while difficulty with PA can hinder reading development (Bodrova et al., 1999). The relationship between PA and reading success was demonstrated by a study completed by Hogan et al. (2005). The researchers assessed linkages between young children’s PA skills and later reading achievement.

The Hogan et al. (2005) study was longitudinal, assessing 570 children in kindergarten, second, and then fourth grade. Subjects were all English speaking, normal hearing, and with no history of significant emotional or neurological disorders. Researchers administered tests of phonological awareness and letter identification during the kindergarten year. In second and fourth grade, researchers administered tests of phonemic decoding and word reading. The Catts Deletion Task (Catts, Fey, Zhang, & Tomblin, 2001) was used to assess phonological awareness in all grades, along with subtests of the Woodcock Reading Mastery Tests, Revised (WRMT-R; Woodcock, 1998). Trained examiners administered the assessments during 2-hour individual sessions.
Hogan et al. (2005) analyzed the data using path analysis (similar to regression analysis) to examine the relationships between the multiple measures. For each relationship, a path coefficient was obtained and examined via a z test for significance.

Results suggested that the kindergarten phonological awareness assessment accounted for unique variance in second grade word reading \( (\beta = .37) \); PA skills were more predictive than children’s ability to name letters in kindergarten. Not surprisingly, the second grade word-reading task significantly predicted fourth grade word reading \( (\beta = .77) \).

The predictive ability of children’s PA ability changed in the later grades. Second grade phonological assessment did not predict fourth grade word reading levels \( (\beta \text{ not significant}) \), although the decoding task predicted a small, yet significant, amount of variance in fourth-grade reading \( (\beta = .15) \). Results suggest that PA skills are very important at early stages of reading development (i.e., second grade), but are less important at later stages (i.e., fourth grade) when children are more skilled and less likely to “sound out” words.

After initial analysis, the study was reexamined with a subset of children rated as mildly to moderately impaired readers per scores on the Oral Reading Accuracy Index of the Gray Oral Reading Tests- Third Edition (GORT-3; Wierderholt & Bryant, 2001). The results were consistent with those in the initial examination, suggesting that phonological awareness skills were positively correlated with second grade reading ability, even for children with reading impairments. The data underscored the need for strong PA skills at early stages of reading development. The researchers suggested that measuring phonological awareness skills in young children provided useful information
for predicting reading ability for both typically developing and at-risk children (Hogan et al., 2005).

Print Knowledge

Print knowledge, also referred to as print awareness or print concepts, involves learning about and comprehending the rules governing the form and function of print and the association between written and oral language (Lafferty, Gray, & Wilcox, 2005). A child, who knows the words on the page of a book “tell a story,” or that the words are read from left to right, demonstrates print knowledge. During the preschool years, children learn about print from verbal and social interactions in the environment. Important literacy activities take place at home, as well as in childcare settings.

Print knowledge is an important domain of emergent literacy. Print knowledge encompasses several components, including alphabet knowledge and print concepts. Print concepts can be further broken down into the areas of alphabetic knowledge, book conventions, print conventions, and print forms. Print concepts are critical skills needed to ensure reading success (Cabell, McGinty, & Justice, 2007; Stewart & Lovelace, 2006).

Alphabetic knowledge sounds rather simple but can be a complex process. Alphabetic knowledge involves recognizing and knowing the names of the letters of the alphabet and the corresponding sounds. Alphabet knowledge is a strong predictor of later reading ability (Adams, 1990; Lafferty et al., 2005).

In contrast, book conventions involve understanding the components of books and how books are organized. As children learn book conventions, they begin to point out components of books including the cover, pages, and title (Stewart & Lovelace, 2006). “Print conventions” are slightly different than “book conventions;” print conventions
refer to the concepts and organization of print in books, such as reading from left-to-right and top-to-bottom.

Another concept, “print forms,” refers to children’s understanding of print units. A child who has a concept of print forms understands the meaning of the words “letter” and “word” and also understands how letters differ from words. Children with language impairments often demonstrate less developed skills in awareness of print forms as compared to typically developing peers (Lovelace & Stewart, 2007).

One of the most important and early developing print concepts is a child’s realization that pictures and print have different meanings and functions. Children begin to understand that words tell the story seen in the book illustration. Children’s attention to text is a foundational step in alphabet knowledge and concepts of print.

Since print knowledge has been correlated with later reading acquisition, this domain should be addressed and promoted during the emergent literacy years (Lovelace & Stewart, 2007). An important way to improve a child’s print concept skills occurs during shared book readings. When adults engage in storybook reading with children, children’s attention is focused on specific aspects of the book, print, vocabulary, and alphabetic concepts. Children practice these skills during natural, interesting, and fun activities that are likely to occur in shared book-reading interactions.

Research has consistently demonstrated significant associations between the quantity and quality of shared book reading experiences in preschool and children’s later reading ability grades (Neuman, 1999; Wells, 1985). By encouraging teachers and parents to explicitly focus on important concepts during shared book readings, children
access and explore important components of print knowledge skills and foster reading development.

Current research and literature supports the efficacy of early intervention strategies to increase children’s print knowledge. Children who are regularly exposed to print have been found to demonstrate significant growth in print concepts over time (Greenwood, Carta, & Walker, 2004). Additionally, children’s emergent literacy scores on tests of print knowledge have been found to have links to later reading achievement (Justice & Ezell, 2001). Specifically, in a study examining the predictive significance of emergent literacy skills on later reading, Lonigan et al. (2000) collected data from two groups of preschool-age children across 13 different locations. The first group consisted of 96 children ages 26-61 months, while the second group consisted of 97 older children ages 48-64 months. Once consent was obtained, trained research assistants individually tested the children in two phases (over two to four sessions). Phase 1 of the experiment was conducted within a 2-3 week period for all children with phase 2 conducted approximately 18-months later.

To assess the older children’s print concepts, researchers administered two tests of letter knowledge, an environmental print task, and a print concepts task during the first assessment phase. During the second phase, researchers administered two tests of letter knowledge, a print concepts task, and two text-decoding tasks. Descriptive statistics were compiled for all variables in both phases. Within-subject ANOVAs were calculated to document change from phase 1 to phase 2.

The data revealed significant growth from the first to the second phase on all repeated tasks (all $p$ values < .001), reflecting stable individual differences and significant
predictive relationships of later reading abilities. The authors reported some skewing of results on the score distribution for letter identification due to a moderate number of children receiving high scores on the task. While this study investigated many other components in addition to print concepts, this summary provides evidence for effectively assessing and monitoring print concept skills. Emergent literacy skills present during preschool, such as letter identification, are reflective of stable individual differences and are predictive of later reading achievement (Lonigan et al., 2000).

**Emergent Writing**

In addition to the areas of emergent literacy previously discussed, emergent writing is another domain in which children begin to explore and develop during the preschool years. Bloodgood (1999) posits that children move through the stages of written expression much as they do oral expression and with similar ease. The emergent writing phase typically begins with simple scribbling, often “growing” out of a picture or drawing. However, what may look like scribbles to an adult begins to represent “writing” in a child’s repertoire. Children often tell adults what their scribbles “say” or mean. It is not uncommon for a child to draw a picture of him/herself with a scribble nearby to represent his or her name.

During the development of emergent writing skills, children begin to show an understanding of some printed words, particularly environmental print (i.e. stop sign or favorite restaurant), and begin to attempt to copy and write simple familiar words. Words recognized early on include the child’s name or other common words important to the child (i.e. Mom, dog,). As children move through stages of emergent writing, their
scribbles begin to take on more recognizable forms as shapes begin to resemble letter approximations.

As children learn to become writers, they sometimes mix up the order of letters or scatter letters around the page. Letter reversals also are common at the early stages of writing development (Invernizzi, Sullivan, Meier, & Swank, 2004). Young writers often rely on invented spellings of words or ask adults to spell words for them.

Following the stage of invented spelling, children’s spelling and writing becomes conventional (Ukrainetz, 2006). Proficiency in invented spelling is significantly associated with other areas of literacy development and successful inventive spellers are more likely to be good readers (Cabell et al., 2007).

When engaging in the writing process, children often observe peers and adults, learn through guidance from others, and invent their own systems. Research suggests that children learn writing skills as naturally as they do speaking (Goodman & Goodman, 1979; Schickendanz, 1993 in Bloodgood, 1999). Many preschoolers learn to write their names and perhaps even some simple memorized words. As with phonological awareness, print knowledge, and oral language, emergent writing experiences lay the groundwork for building essential literacy skills.

Adams (1990) stated that children who have quality experiences with writing during early childhood are more likely to be successful with later reading and writing activities as compared to children only exposed to alphabet learning. Emergent writing skill development should be approached in ways that are fun and functional for children. Good high quality writing experiences should allow children to express themselves and practice the various components of literacy (Bloodgood, 1999; Ukrainetz, 2006).
A specific component of emergent writing evident in early childhood literacy development is name writing. His or her name is often the first word a child attempts to write, and typically the first letters to be identified by a child are those in his or her name. Initially, children view their names as a single unit as opposed to a word comprised of individual letters and sounds. The spelling of one’s name is initially a memorized demonstration versus a function of letter-sound correspondence.

Cabell, Justice, Kaderavek, Turnbull, & Breit-Smith (2009) summarized multiple research studies conducted with children developing typically. The authors reported that when learning to write their name, children across various alphabetic languages follow a general sequence that consists of (a) scribbling, (b) linear scribbling, (c) separate symbols and forms resembling letters, (d) name written with letters and symbols, (e) name with letters (may be some reversals or omissions), and (f) name written in correct formation. Generally measures of children’s writing ability documents children’s performance along these developmental steps.

One example of this the developmental sequence in name writing can be seen in the Name Writing subtest of the Phonological Awareness Literacy Screening (PALS; Invernizzi et al., 2004). As a result of the links between name writing and various aspects of emergent literacy and phonological awareness, name writing is utilized in the PALS as an indicator contributing to overall performance on the assessment. The PALS uses a scale ranging from zero to seven to score a child’s name-writing sample. For instance, a zero is assigned to a circular scribble with no distinct features, while a child drawing a picture with a separate unrecognizable scribble receives a score of two. A
score of six is awarded when the name is generally correct, even if some reversals are present and a score of seven is a completely correct name-writing sample.

In this rating system, assessment and scoring of name writing closely parallels the developmental trajectory of name writing development. In order to encourage development of name writing skills, educators promote exploration of writing tools and writing activities. In high-quality settings, educators provide relevant materials in multiple areas of the classroom for experimentation (Cabell et al., 2009; Invernizzi et al., 2004).

To demonstrate the significance of name writing in emergent literacy, Cabell et al. (2009) examined various emergent literacy skills thought to be associated with name-writing abilities. The authors hypothesized that a positive concurrent relationship would exist between children’s name writing ability and their other emergent literacy skills. Twenty-three typically developing children and 59 children with language impairments were assessed as part of the study. The typical children were required to have standard scores of 85 or above on standardized tests of language, falling within the average range. The emergent literacy areas assessed included uppercase alphabet knowledge, print concepts, rhyme awareness, listening comprehension, and name writing. Standardized assessment tools employed for this purpose were the Phonological Awareness Literacy Screening (PALS)- PreK, Preschool Word and Print Awareness Test (PWPA; Invernizzi et al., 2004), and the Test of Oral Language Development- Primary: 3 (TOLD-P: 3; Newcomer & Hammill, 1997). Data analysis revealed significant correlations among the various domains of emergent literacy. The authors suggested that the results
demonstrated the value of emergent writing skills as an important component of children’s early literacy development.

**Risk Factors in Literacy Acquisition**

Emergent and conventional literacy skills represent a developmental continuum. Lonigan et al. (2000) indicated that the skills children have when they enter school are predictive of later academic performance. Children who are able to read well and have had quality early literacy experiences show gains across multiple academic domains as they mature (Morris et al., 2003). Unfortunately, the reverse also is true; children who are poor readers in early grades are likely to continue to be struggling readers. To demonstrate this link, a study conducted by Juel (as cited in Whitehurst & Lonigan, 1998) reported a high correlation between classification as a “poor reader” in fourth grade and classification of “poor reading” in first grade ($r = .88$).

Struggling readers are very likely to experience more general academic problems. Essentially all academic domains depend on the reading process. Many of the prerequisite skills for becoming a successful reader are based on early developing foundational literacy skills. Children with a strong foundation in literacy skills have an increased probability of academic success upon entering school age programming (Lonigan et al., 2000).

Research has documented persistent links between certain characteristics or conditions in children and difficulties with literacy acquisition. Children who are from families of low socioeconomic status (SES), those who are English language learners (ELL), and those who present with speech or language impairments are at increased risk for difficulties in learning to read and continued problems throughout their academic
careers, and into adulthood (Lonigan et al., 2000). Consistent exposure to emergent literacy experiences is invaluable, as oral language, phonological awareness, print knowledge, and emergent writing skills are causally related to later conventional reading abilities.

While some children are at significant risk for delays in literacy acquisition, there is evidence that if the areas of weakness are identified during early childhood, it is possible to remediate delays, as well as prevent or minimize later reading difficulties (Rvachew & Grawburg, 2006). While there are multiple factors that put children at-risk for difficulties in literacy development, this paper focuses specifically on children who are at-risk due to diagnosed speech or language impairments.

**Speech or Language Impairments**

It has been estimated that as many as 40 to 75% of preschoolers with speech or language deficits are likely to have reading difficulties in school (Missall, McConnell, & Cadigan, 2006). Adams (1990) reported that one in three children experience significant difficulties in learning to read. Learning to read is negatively affected when the child presents with speech or language impairment, as the impairment may affect the child’s opportunities to actively participate in and benefit from literacy activities (Lovelace & Stewart, 2007).

A majority of poor readers have been found to have deficits in oral language and phonological skills, performing poorly on tests of phonological sensitivity (Torgesen, 1999; Webster & Plante, 1995). Studies have shown that increased vocabulary skills are related to phonological awareness. For children with expressive language impairments, vocabulary development is a common area of weakness (Nicolson et al., 2001 as cited in
Rvachew & Grawburg, 2006). Speech or language impairments can have detrimental limitations on a child’s ability to develop the phonological sensitivity skills necessary for reading acquisition. Therefore, it is not a surprise that children with oral language, articulation and/or phonological deficits have been found to display deficits in emergent literacy skills (Lonigan et al., 2000; Rvachew & Grawburg, 2006).

Lovelace and Stewart (2007) reported that children with language impairments ask fewer questions and demonstrate reduced attention during shared storybook reading sessions compared to their typically developing peers. In addition, researchers indicated that when adults interact with children with language impairments, adults ask fewer questions, comment less on print, and engage in a reduced oral storytelling. The more limited interactions negatively influence the early literacy experiences of children with speech or language impairments.

Children with speech or language impairments represent a population at significant risk for delays in the important literacy domain of phonological awareness (Rvachew & Grawburg, 2006). Due to the strong link between phonological awareness skills and literacy proficiency, the presence of a speech or language impairment places children at increased risk for difficulties with literacy acquisition. Diagnoses of expressive or receptive language impairments, articulation, and/or phonological processing disorders negatively influence children’s sensitivity to PA tasks. Because of the increasing evidence that (a) speech and language skills affect phonological awareness and (b) phonological awareness affects effective literacy acquisition (Lonigan et al., 2000), educators should attend to PA concepts for children with language delays or deficits.
Recently researchers have considered the emergent literacy skills of children with language delays (Cabell et al., 2009). Assessments include uppercase alphabet knowledge, print concepts, rhyme awareness, listening comprehension, and name writing. The standardized assessment tools included the Phonological Awareness Literacy Screening-PreK (PALS-PK; Invernizzi, 2004), Preschool Word and Print Awareness Test (PWPA; Justice & Ezell, 2001), and the Test of Oral Language Development- Primary: Third Edition (TOLD-P: 3; Newcomer & Hammill, 1997). Twenty-three children with language impairments were matched with 23 children with typically developing language skills. Matching was done based on age and socioeconomic status (SES).

The researchers conducted a series of ANOVAs to determine significant differences between children’s performance on the emergent literacy measures. The two groups showed significant differences on alphabet knowledge, $F (1, 43) = 29.17, p < .01, d = 1.56, [95\% CI: .9-2.23]$, print concepts, $F (1, 43) = 27.60, p < .01, d = 1.54, [95\% CI: .87-2.2]$, and rhyme awareness, $F (1, 43) = 46.90, p < .01, d = 2.01, [95\% CI: 1.29-2.72]$. In addition, the typical children were found to show significantly more advanced name writing representations than the language-delayed children. This represented a very large effect size ($d = 1.31$) with a 95% confidence interval of .68 to 1.95. Looking further, it was reported that the mean name writing score for children with language impairments ($n = 23$) was 6.39 (out of a possible 14), while the typical children ($n = 23$) had a mean score of 11.2. The study documented that children with speech or language impairments struggle with acquisition of emergent writing skills along with difficulty in other areas of emergent literacy.

**Effects of Intervention**
As documented above, children with speech or language impairments are at increased risk for difficulties in learning to read, may struggle to become proficient readers, and may experiencing problems throughout their academic careers and into adulthood (Lonigan et al., 2000). As a result of this data, educators are expected to integrate evidence-based assessment and intervention practices into early childhood classrooms to mitigate possible delays in literacy development.

Research documents the impact of early intervention for at-risk children. Specifically, Baliet, Repper, Piasta, and Murphy (2009) conducted a study to: (a) identify 4-5 year old preschoolers who demonstrated delays in critical emergent literacy skills and (b) provide an experimental, targeted educational intervention to reduce academic risk. The researchers utilized a universal screening of all children at participating preschool and childcare centers to identify children at risk for reading failure. Intervention then took place in the regular early childhood setting with an experimental group.

Prior to conducting the study, the researchers reviewed universal screening results across 38 early childhood programs and identified 220 at-risk children based on early literacy screenings conducted by the program. The eligible children were randomly assigned to either an: (a) immediate or (b) delayed intervention group.

The intervention consisted of 18 30-minute lessons focusing on critical emergent literacy skills over the course of nine weeks. Each intervention lesson was based on a curriculum developed specifically for the study. The researchers hypothesized that: (1) at-risk children would show significant and meaningful gains in pre-reading skills following the interventions, (2) intervention groups would not differ when reassessed following the spring intervention (no group effect on third set of assessment scores), and (3) gains of
the fall group would be maintained throughout the spring intervention. Children were randomly assigned to groups for the fall versus spring intervention, with the spring group serving as controls for the fall group.

Descriptive statistics data was reported for both groups, including means, standard deviations, and ranges across all three administrations. The “Get It, Got It, Go!” (GGG; Missall & McConnell, 2004) pre-literacy assessment, consisting of three tasks of individual growth and development indicators, (Picture Naming, Rhyming, and Alliteration) was used to measure and monitor the children’s emergent literacy skill development over the course of the school year (fall, winter, spring).

Significant effects were reported for the intervention from fall to winter with gains on the GGG subtests of alliteration and rhyming. The Cohen’s $d$ for the intervention across all the alliteration subtests was .44, while the rhyming subset had a Cohen’s $d$ of .35, both representing small- to medium-effect sizes. The picture-naming subtest did not show significant effects of intervention on performance from fall to winter (Cohen’s $d = .23$), indicating a small effect size (Cohen, 1988 as cited in Hinkle et al., 2003).

Researchers reported that number of intervention sessions resulted in significant positive impacts on children’s scores. Similar data is reported for the delayed-intervention group. Treatment gains and maintenance of effects also were considered for the fall group following the spring intervention; results indicated that gains were maintained from the winter to spring assessment (Bailet et al., 2009). This study provided data documenting the effectiveness of emergent literacy intervention for children at-risk for reading failure. The data also suggests if at-risk children are
identified (with the use of appropriate assessments), early intervention can reduce academic risk.

**Response to Intervention**

It has been found that approximately one out of six children experience reading difficulties during the early school years and that, if a child has difficulty reading in the early grades, reading difficulties are likely to continue throughout the student’s school career. These large numbers are alarming and cause for concern in our educational system. It is essential to find the most effective ways to remediate reading difficulties.

Johnston and Allington (1991) suggested that the most sensible way to decrease the occurrence of reading disability is to take a preventative approach. If educators can prevent reading delays or disabilities from occurring at early stages, children are less likely to struggle with reading during the later elementary, intermediate, and secondary school years (Parker, 2008).

Fuchs and Fuchs (2007) noted that high quality intervention can improve students’ reading performance. However, no single approach to intervention is successful with all children. Therefore, the most logical approach is to continuously monitor children’s emergent literacy development in the early years. By monitoring development, children who are not responding to intervention can be identified and interventions can be modified, adapted, or intensified as needed.

RTI is based on a problem-solving model that uses a cyclic process of assessment, intervention, and progress monitoring to ensure quality educational experiences for all children. Intervention intensity is determined based on data from progress monitoring techniques. The general approach of RTI includes three levels or tiers (shown in Figure
2), which represent a continuum of academic and intervention supports of increasing intensity. All children in a class are screened or assessed, providing data to identify at-risk children for intervention. These at-risk children are provided with classroom-based interventions rooted in scientific evidence-based practice, with ongoing assessment throughout the intervention.

*Figure 2. RTI framework of assessments and interventions within early childhood*

*Adapted from Snyder, Wixsom, Talapatra, and Roach, 2008*
High quality differentiated instruction and support is considered Tier I in the RTI model. Children who fail to respond to the intervention may require the addition of more intensive targeted intervention (Tier II of intervention). Children generally receive Tier II intervention via small groups instruction provided by the classroom teacher, a speech-language pathologist, or other educational professional. Children who are unresponsive to the Tier II interventions are provided intense, specialized, individualized intervention (Tier III intervention), with continued ongoing monitoring. A very small number of children, typically those who demonstrate significant academic or behavioral skill deficits require support at the Tier III level.

A child provided with intensive Tier III interventions, yet demonstrating persistent difficulties, may be recommended for special education programming. Special education programming provides individualized instruction and accommodations to students with disabilities to address his or her unique educational needs (Fuchs, Fuchs, Compton, & Bryant, n.d.; NCLD, 2006; Ohio Department of Education [ODE], 2008).

The three-tiered response to intervention framework aims to unite the philosophies and goals of gifted, general, and special education to meet the needs of all students. This comprehensive, system-wide approach to instruction, assessment, intervention, and progress monitoring that comprises RTI focuses on effective practices to improve outcomes for all students (ODE, 2008).

The most effective method to improve outcomes for children struggling with pre-academic concepts, including literacy, is to identify these deficits and provide targeted intervention during the preschool years. Hagans-Murillo (2005) suggested that the number of children who experience reading difficulties can be significantly decreased if
an RTI model is implemented in early childhood programs. She claims that preschool RTI models need to be proactive and preventative, promoting the timely acquisition of key emergent literacy skills. By instituting an RTI model in early childhood programs, it is suggested that children’s risk of reading disability can be reduced.

Implications for Early Childhood

As previously described, the response to intervention process emphasizes early intervention and prevention of learning difficulties as opposed to the more reactive remediation process utilized in past practice. RTI features three levels or tiers of interventions based on individual student needs, focusing on identifying discrepancies before students fail or as described by Torgeson (1998), “catching them before they fall.” Interventions are implemented at the earliest point possible, thus providing justification for RTI in early childhood settings (Justice, 2006).

Access to appropriate and effective progress monitoring assessment tools, to monitor student progress at the tiered levels, allows educators to engage in data-driven decision making throughout the RTI process (Walker et al., 2008). A 2005 report by the United States Office of Special Education Programs, National Center on Student Progress Monitoring identified seven standards of technical adequacy that must be included in a high-quality progress-monitoring tool. A high-quality progress monitoring tool should: (a) have alternate forms, (b) specify a child’s level of improvement, (c) be linked to instructional benchmarks or goals, (d) be sensitive to small increments of progress, (e) provide improvements in teacher planning/student learning, (f) have established reliability and (g) have good validity. These standards should be carefully considered by early childhood educators to assist in choosing a tool to match the intent of the
assessment (Barnett et al., 2006; Fuchs, Fuchs, Compton, & Bryant, n.d.; NCLD, 2006; Ohio Department of Education [ODE], 2008).

Currently the most popular tools for progress monitoring systems in RTI are Curriculum-Based Measurement or CBM (Shinn, 1989) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Moats, Good, & Kaminski, 2003). While these tools meet many of the criteria outlined above, they have not been found to have appropriate technical adequacy for measuring preschool literacy skills nor been validated with the preschool age group. To effectively implement the RTI framework at the early childhood level, valid, reliable, and useful tools, meeting the seven standards for technical adequacy are essential. Appropriate tools that are effective in addressing the multiple assessment components of RTI will assist in the identification of at-risk children, facilitate intervention planning, and allow for frequent progress monitoring.

**Emergent Literacy Assessment**

Prevention of reading difficulties requires not only high quality instruction, but also quality assessment tools. In order to be proactive in regards to emergent literacy intervention, educators need access to tools that quickly identify children who are not demonstrating the core components essential for reading success. These tools need to not only identify children who are at-risk for literacy development, but should also be relevant for intervention planning and ongoing progress monitoring (Parker, 2008). An appropriate assessment tool must meet all of the above requirements as well as demonstrate technical adequacy and be considered reliable and valid for measuring the critical emergent literacy skills.
Screening is often the first step in the assessment process. Screenings are typically utilized to assess a wide range of skills to identify children who are at risk for potential learning problems (McAfee & Leong, 2007). Screenings are practical for classroom teachers, as they are able to assess a large number of children efficiently. While screenings are frequently used in classroom settings, they simply provide a “quick look” at the child’s overall development and do not delve deeply into specific skills and abilities (Mindes, 2007). Many screenings are developmental in nature and assess a wide variety of skills. However, there are also screenings specific to particular developmental domains (i.e. motor, social, language, etc.).

An article by Justice et al. (2002) described the importance of utilizing screenings to assess emergent literacy skills. The authors stated that screening is a valuable tool to detect early literacy difficulties and determine those children who may require additional assessment as well as guide intervention and instruction planning. Justice et al. suggested that an ideal emergent literacy screening should encompass the areas of written language, phonological awareness, letter name knowledge, grapheme-phoneme correspondence, literacy motivation, and home literacy. When designing such a screening protocol, the features of psychometric quality, comprehensiveness, and sensitivity should be addressed. Screening protocols can be commercially developed instruments or teacher/clinician designed (Justice et al.).

**Diagnostic Assessments**

Diagnostic assessment differs from screening, as it provides a more specific, in depth look at the child’s performance in a particular area. Trained professionals (i.e., speech and language pathologists, school psychologists, occupational therapists, etc.)
often complete diagnostic assessments to identify specific strengths and deficits in the child’s skill repertoire. Based on a child’s performance on a diagnostic assessment the professional may make specific recommendations. Results from diagnostic assessments are often used to identify children eligible for special programs or services through the school district. Results also assist in planning for specific interventions or remediation to target noted skill deficits. While specialists typically administer diagnostic assessments, additional information regarding the child’s abilities is often obtained from the classroom teacher or parent, as these individuals frequently carry out the specific intervention recommendations (McAfee & Leong, 2007; Mindes, 2007).

Norm-reference tests are often used in school settings to effectively measure a child’s performance in a specific skill area as compared to the performance of other children with similar characteristics. These are customarily published assessment instruments that have undergone a thorough process to obtain normative data, thus providing “norms” for the assessment. The norms are the scores obtained from the sample during the standardization procedures. These allow the child to be compared to a sample of other children in order to eliminate bias in assessment (Mindes, 2007).

Norm-reference tests have distinct standardized instructions for setup of materials, administration, and scoring that are to be strictly adhered to during assessment. Over the last decade or so, educators have begun to think differently about the assessment process. Educators are moving away from the “diagnostic approach” and moving towards a “preventative approach” for identification and progress monitoring of at-risk children.

Progress Monitoring Assessments
Progress monitoring tools are becoming widespread in educational settings due to initiatives such as the No Child Left Behind Act of 2001 (PL 107-110), focusing on increasing reading achievement for students. The NCLB Act is resolute about the early identification and intervention of children at-risk for reading difficulties (NCLB, 2001).

Progress monitoring provides evidence regarding what children learned and what goals they have accomplished. Progress monitoring also motivates students and parents. Progress monitoring can be defined as a focused look and comparison with prior information obtained regarding the child’s abilities.

In order to monitor a child’s progress, the educator must have data from one point and then reassess to make comparisons in progress. The data collection points should have enough time in between them to reveal development and learning. Progress monitoring is a natural way for teachers to measure a child’s progress on specific curriculum goals and objectives in structured ways (McAfee & Leong, 2007). When utilizing the RTI model, progress monitoring is employed to continuously assess student skill levels and engage in a data driven decision-making process. Students are closely monitored throughout the three-tiered model via progress monitoring techniques (NCLD, 2006).

One empirically validated method of monitoring progress is through curriculum-based measurement (Shinn, 1989), which is used to track student’s growth in essential components of the curriculum. Curriculum-based measurement (CBM) is directly related to the instructional areas of reading, writing, math, and spelling and is a valid and reliable measure for children in kindergarten through eighth grade. CBM provides alternate forms for frequent monitoring and offers established goal setting guidelines and
instructional standards. Fuchs and Fuchs (2006) reported that teachers who utilize CBM have been found to enhance the quality of their instruction, demonstrate increased levels of achievement for students receiving specialized services, better identify students in need of additional intervention, and design stronger instructional programs. Although CBM has established technical adequacy for elementary and middle school children, the tasks have not been effective for preschool-aged children (Hagans-Murillo, 2005; Walker et al., 2008).

Curriculum-based assessment, an approach that can be used as a classroom progress monitoring measure, is directly related to the curriculum goals and objectives of the classroom. In order to use curriculum-based assessment successfully, the teacher must break down the major overarching themes into small measurable components. By breaking up the learning task, the educator develops appropriate learning outcomes that can easily be measured and assessed.

Many commercially available curriculums have assessments are aligned to the curriculum standards, thus linking assessment to instruction. Curriculum-based assessments allow for analysis of specific components targeted for intervention. Mindes (2007) described the goal of curriculum-based assessment as “finding a test that is the same as the task.” Curriculum-based assessment provides teachers with reliable and valid measures of academic performance and is considered to be an authentic measure (Fuchs & Fuchs, 2007; McAfee & Leong, 2007).

Regarding literacy skills, there are several progress-monitoring tools currently available that focus on identifying potential reading difficulties. Two of the widely recognized instruments in the area of emergent literacy are: the Dynamic Indicators of
Basic Early Literacy Skills (DIBELS; Moats et al., 2003) and the Get It, Got It, Go! preliteracy assessment (GGG; Missall & McConnell, 2004). The DIBELS has versions designed for administration to preschoolers as well as elementary school children and are administered three times per year (McAfee & Leong, 2007).

The GGG (Missall & McConnell, 2004) is specific to preschool and is administered twice annually to measure growth and development in the areas of expressive language and phonological analysis. The DIBELS (Moats et al., 2003) and GGG are criterion-referenced assessments, administered by a teacher or other qualified professional in a one-to-one testing situation. They are designed to target potential gaps in children’s literacy skills in order to provide for targeting and implementing interventions. In addition, they are intended to monitor growth as children progress through the stages of early literacy acquisition.

Assessing Emergent Literacy Skills

Assessment of emergent literacy skills is a relatively new phenomenon in the field of early childhood, not to mention for those young children with language impairments. When assessing emergent literacy skills, one should choose assessment methods that specifically address the skills of interest. Evaluating awareness and understanding of literacy concepts in young children can be challenging, particularly when involving children with disabilities. To assess the domains of oral language or phonological awareness, Schuele, Skibbe, and Rao (2007) recommend beginning with a simple approach, ensuring assessment methods are developmentally appropriate and measure skills at or slightly above the child’s level. This is a major concern with current assessment instruments. Many instruments attempt to assess all children using the same
standards (i.e. alliteration) regardless of whether or not the children are ready for these skills.

The area of print knowledge is important to assess when considering emergent literacy. When assessing print knowledge, one should aim to assess print organization, meaning, and the function of print (Cabell et al., 2007). Erickson (2000) described Marie M. Clay’s “Concepts about Print” or CAP technique for assessing print knowledge. The CAP technique measures understanding of: book orientation, print meaning, directionality and orientation, relationship between print and oral language, and conventions of print. These skills are measured via reading one of two books, which have been constructed to create opportunities to demonstrate the desired skills. While the CAP technique provides for an authentic measure of emergent literacy skills, it has been criticized for its narrow focus and cultural bias. By assessing print knowledge and other emergent literacy concepts, teachers and specialists can determine what experiences children have had with print, their understanding of print, and where possible intervention may need to be focused (Adams, 1990; Lonigan et al., 2000). Determining a child’s level of literacy development allows adults to provide meaningful opportunities for children to experience and engage in the reading process.

The primary tools currently being utilized to assess emergent literacy skills in early childhood programs, as briefly mentioned earlier in this paper, are the Dynamic Indicators of Basic Early Literacy Skills (Moats et al., 2003) and the Get It! Got It! Go! (Good & Kaminski, 2002). These assessments were developed as criterion-referenced, ongoing, progress monitoring tools in the area of literacy. While they are able to provide
a measure of progress monitoring, each has its strengths and weaknesses, which will be discussed in detail below.

The *Dynamic Indicators of Basic Early Literacy Skills*, or DIBELS (Moats et al., 2003), are one-minute fluency measures, designed to assess early literacy skills in children preschool through sixth grade. The DIBELS claims to measure empirically validated skills related to reading acquisition as well as predict reading proficiency via reliable and valid indicators. The authors of DIBELS promote use of the assessment tool for ongoing progress monitoring, as the measures are sensitive to changes in skills over time.

The DIBELS measures assess the core literacy components of phonological awareness, alphabetic principle, accuracy and fluency, vocabulary, and comprehension. The components and the skills measured by each are described in Table 1. It is cautioned that the domains in Table 1 are simply indicators of early literacy skills, not a comprehensive measurement of all skills. This is evident in the fact that the phonemic awareness measure in DIBELS (Moats et al., 2003) assesses initial sound fluency and segmenting sounds but does not include rhyming, alliteration, or blending (Conkle, 2005).

While the DIBELS (Moats et al., 2003) measures are intended to be indicators of a broader skill base, only certain indicators are administered at each grade level. To provide benchmark assessments or general screening information, the DIBELS assessment should be administered at predetermined intervals (three times a year). The DIBELS protocol recommends administering the tool more often to at-risk children to facilitate progress monitoring.
Table 1

**DIBELS Domains and Skills Measured**

<table>
<thead>
<tr>
<th>Domains</th>
<th>Skills Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phonemic Awareness</strong></td>
<td></td>
</tr>
<tr>
<td>Initial Sound Fluency</td>
<td>Ability to identify and produce initial sounds in words</td>
</tr>
<tr>
<td>Phonemic Segmentation Fluency</td>
<td>Ability to produce individual sounds within words</td>
</tr>
<tr>
<td><strong>Alphabetic Principle and Phonics</strong></td>
<td></td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>Knowledge of letter-sound correspondence and ability to blend letters together to form unfamiliar nonsense words.</td>
</tr>
<tr>
<td><strong>Accuracy, Fluency, Comprehension</strong></td>
<td></td>
</tr>
<tr>
<td>Oral Reading Fluency</td>
<td>Ability to read grade level text materials</td>
</tr>
<tr>
<td>Retell Fluency</td>
<td>Ability to understand verbally read text</td>
</tr>
<tr>
<td><strong>Vocabulary and Oral Language</strong></td>
<td></td>
</tr>
<tr>
<td>Word Use Fluency</td>
<td>Ability to use a word in a sentence</td>
</tr>
</tbody>
</table>

Taken from Moats et al. (2003)

At the preschool level, only two subtests or indicators are administered. These are the *initial sound fluency* and the *word use fluency* indicators. Therefore, there is a very limited set of emergent literacy skills being assessed by the DIBELS for children in early childhood settings.
At the preschool level, the DIBELS (Moats et al., 2003) measures whether or not a child can identify beginning sounds in words and use words accurately within the context of a sentence. Unfortunately, no other essential emergent literacy skills are measured for preschool children using the DIBELS assessment. It has been thoroughly and consistently documented, that there are many more components of emergent literacy essential for literacy success. By simply assessing two surface components of emergent literacy, educators are limited in their ability to track student’s literacy development. While the DIBELS provides a starting point for looking at emergent literacy skills, it is extremely limited at the early childhood level and has many weaknesses in regards to effectively assessing emergent literacy skills (Conkle, 2005; Shelton, Altwerger, & Jordan, 2009).

There are many criticisms of the DIBELS (Moats et al., 2003) assessment, not simply at the early childhood level but throughout the elementary grades. Many teachers feel that DIBELS is not a good predictor of reading performance, but simply a measure of reading speed. The validity of DIBELS has been questioned because of the strong reliance on one-minute indictors of speed and accuracy to identify children who are at-risk. The timed administration of DIBELS is not reflective of actual reading skills needed in classroom settings and is not a natural or authentic method for measuring literacy skills (Shelton et al., 2009).

It has been argued that the comprehension assessments used in the DIBELS (Moats et al., 2003) are extremely narrow and can be poor predictors of reading risk. Measures of reading fluency, without simultaneously measuring comprehension, are very
uninformative. Due to the noted weaknesses of DIBELS, there is a need for assessments that call for both fluent reading as well as decoding and comprehension (Samuels, 2007).

The Get It! Got It! Go!, or GGG (Good & Kaminski, 2002), is a second progress monitoring tool used to assess critical early literacy skills at the preschool level. Authors of the GGG claim that the tool is a quick, reliable, and repeatable measure and that it predicts a child’s success in reading comprehension, decoding, and fluency. The GGG is comprised of three timed fluency measures, administered in the fall and spring semesters of the school year. By screening all preschoolers with the GGG educators are able to gather universal data on the students in the program, to assist in educational decision-making. Provided that the GGG is repeatable, it allows for ongoing progress monitoring throughout the school year (Office of Early Learning & School Readiness [OELSR], 2008).

The GGG (Good & Kaminski, 2002) is composed of Individual Growth and Development Indicators or IGDIs. IGDIs are quick, efficient, and repeatable developmental performance measures for children ages 30 to 66 months. IGDIs represent a sample of behaviors from each developmental domain related to later competence (Priest et al., 2001). The Early Childhood Research Institute on Measuring Growth and Development (1998) has created and evaluated a set of IGDIs related to specific educational outcomes. Early literacy development is one of the outcome areas, with specific IGDIs available to measure expressive language and phonological awareness (McConnell, McEvoy, & Priest, 2002; McConnell, Priest, Davis, & McEvoy, 2002; Walker et al., 2008).
The GGG utilizes IGDI in the domains of expressive language and phonological awareness to measure emergent literacy skills. Table 2 summarizes the domains and skills measured by the GGG.

Table 2

GGG Domains and Skills Measured

<table>
<thead>
<tr>
<th>Domains</th>
<th>Skills Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Language</td>
<td></td>
</tr>
<tr>
<td>Picture Naming</td>
<td>Ability to label presented colored drawings</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td></td>
</tr>
<tr>
<td>Rhyming</td>
<td>Ability to point to a colored drawing in a field of three that rhymes with or “sounds the same as” the stimulus drawing</td>
</tr>
<tr>
<td>Alliteration</td>
<td>Ability to point to a colored drawing in a field of three that “starts with the same sound” as the stimulus drawing</td>
</tr>
</tbody>
</table>

Taken from Good and Kaminski (2002)

The GGG (Good & Kaminski, 2002) measures are recommended to support educators in using IGDI data to (a) identify children with delays in early literacy skills, (b) monitor development over time, and (c) implement data-based decision-making processes for evaluation and intervention (McConnell et al., 2002). While the GGG measures are indicators of individual growth, they do not specify predetermined cutoff scores for mastery or performance levels. This lack of benchmarking makes it difficult for educators to interpret children’s scores in relation to his or her age group. If teachers
are unable to easily interpret scores for instructional purposes, the test lacks relevance for intervention planning and progress monitoring (OELSR, 2008; Shilling et al., 2007).

The Early Childhood Research Institute on Measuring Growth and Development (1998) suggest that IGDIIs provide a general outcome measure for early literacy skills. The GGG assesses a limited, discrete number of skills deemed essential for proficient literacy development. The GGG (Good & Kaminski, 2002) measures one component of oral language (vocabulary) and two components of phonological awareness (rhyming and alliteration). Additional critical emergent literacy skills (print knowledge and emergent writing) are not assessed by the GGG, greatly limiting the ability to identify individual weaknesses and to provide supports to increase the student’s chances for reading success.

As with DIBELS (Moats, et al., 2003) measures, the GGG (Good & Kaminski, 2002) focuses on the speed and efficiency of the child’s performance. Many educators have expressed concerns that this is not a good predictor of later reading performance, thus bringing the validity of the GGG under scrutiny. The timed measures that comprise the GGG are rote tasks, not reflective of skills a child would be required to demonstrate in an early childhood classroom and are, therefore, not contextually relevant (Greenwood et al., 2008; NAEYC, 2004; Shelton et al., 2009).

**Call for New Measures**

Educators and researchers are in agreement that exposure to and attainment of emergent literacy skills is important for young children. However, simply accepting that emergent literacy skills are important is not enough. Educators need to have valid and reliable methods to determine which children possess adequate levels of these skills and which children do not. Once emergent literacy skills can be measured effectively,
teachers and specialists can confidently implement interventions and monitor the progress of those in need of additional experiences and supports.

Unfortunately, up to this point, many of the assessment tools designed for use with young children have been for screening or diagnostic purposes as opposed to progress monitoring. Current measures or assessments in the field of early childhood are not adequately aligned with the theories and philosophies behind the RTI model. The tools currently available typically do not elicit information deemed useful for intervention development, one of the major components of RTI (Bagnato & Neisworth, 1991; Greenwood et al., 2008). Snyder, Wixson, Talapatra, and Roach (2008) suggested that the future of early childhood assessment within the RTI framework is directly related to the ability to quickly and accurately identify children who are not making adequate progress, respond to the student’s needs using evidence-based intervention practices, and monitor the impact of the intervention on the student’s learning and academic progress.

Additionally, literacy assessment tools like DIBELS (Moats et al., 2003) and GGG (Good & Kaminski, 2002) lack authenticity, as they do not align with general teaching and learning practices in early childhood settings. Assessments like the DIBELS and GGG include a series of rote, discrete tasks and activities aimed to measure a child’s performance on a specific skill. By having a more child-friendly, naturalistic task, educators can measure young children’s skills in a more effective and authentic manner. This ability will allow educators to identify and provide interventions for at-risk children, while continually monitoring their progress throughout the process (Kaderavek, 2009). A novel assessment tool is needed to accurately screen and monitor important emergent literacy skills in a contextually relevant and authentic manner.
Test Construction

There are four processes reported in the literature as being valuable to test construction. These include construct definition, item construction, scoring strategy specification, and application of measurement model. The underlying assumptions to these processes, as reported by Wilson (2005), are that the instrument is representative of the construct being measured and that the scoring system will effectively use this information to reflect the amount of the latent trait the test taker possesses. The developer must select the measurement method (i.e. interview, rating scale, test, etc.) and the various skills or behaviors that make up the construct. The skills or behaviors are referred to as the items. This could include test questions, ratings, or other counts depending on the measurement type. The Phonological Awareness Literacy Screening-PreK (PALS-PreK; Invernizzi et al., 2004), a scientifically based phonological awareness and literacy screening that measures preschoolers’ developing knowledge of important literacy fundamentals, will be referenced throughout this section, as the PALS-PreK recently underwent the process of test development.

Construct Definition

When defining the construct, the test developer outlines the attribute or construct for the tool, determines the need for the new measure, and defines the target population, purpose, and intended use. The purpose, population, and intended use affect the type of tool one creates. The assessment tool must be relevant for the intended setting and population. For example an instrument developed for group screening purposes may not need to be developed with as much rigor as one being utilized on an individual basis for diagnoses of mental health disorders.
While all tools do not require the same measurement accuracy, each tool should have reasonable power for its intended purpose (i.e. research versus diagnosis). For example, obtaining a false positive on a group screening for self-esteem issues, indicating a child has low self-esteem, does not have as significant and potentially hazardous implications as compared to the serious nature of falsely diagnosing and possibly medicating a child for a mental health disorder (i.e. bipolar disorder). A false-positive score occurs when a tool demonstrates poor discriminative validity and/or weak construct validity, resulting in measuring the intended construct with poor sensitivity or accuracy.

Defining the construct for the PALS-PreK (Invernizzi et al., 2004) involved multiple considerations and components.

- Demonstration of the need for an early childhood assessment was documented by (a) the widespread popularity of the PALS kindergarten assessment and (b) the need for early identification of reading difficulties.

- The tasks were chosen based on a representative sample of tasks found on other emergent literacy measures.

- Multiple well-documented assessments and current research findings were reviewed to guide developers in defining the construct.

- Administration procedures, task format, and presentation methods were modeled after psychoeducational research and developmentally appropriate practices for early literacy assessment.

- An advisory review panel made up of experts in emergent literacy (preschool teachers, early childhood program coordinators, university faculty members, and other educators) evaluated the content.
Construct validity studies were completed using factor analysis to measure the degree to which the underlying traits reflected the theoretical construct intended for the assessment.

**Item Development**

Once the construct is defined, a measurement method selected, and the purpose, use, and population determined, the developer can move on to item development (Lambert, Nelson, Brewer, & Burchinal, 2006). When developing a novel measurement tool, item development is of the utmost importance. Instrument test items must effectively measure the construct of interest, in this case being discussed, emergent literacy. Without items reflective of the construct, the tool is of minimal value.

In regards to emergent literacy, a vast amount of research and studies have been conducted and are available in the literature to assist in defining the construct. Therefore, in regards to item development, skills from the four domains articulated previously in this paper (oral language, phonological awareness, print knowledge, and emergent writing), which have been highly researched and reported in the literature as essential for successful literacy experiences, should be utilized (Bodrova et al., 1999; Justice, 2006; Morris et al., 2003).

Test items should represent the underlying themes or purpose of the assessment instrument. When several constructs are being measured, one must determine if clusters exist between or within the constructs. There are various mapping techniques that can be used for this purpose. It is suggested by Lambert et al. (2006) to write at least twice the amount of items for each subtest than required for the final instrument. This allows for
elimination of poor items or ones that appear to overlap. The items representative of the subtests or constructs should measure the conceptual theme intended.

In order to identify the underlying themes, the four key areas identified previously as being predictive of later reading ability, should be utilized for assessment items. Once the test items are written, test developers determine the measurement level desired. This can be nominal (categorical, non-ordered), ordinal (ordered categories), interval (continuous, equal intervals), or ratio (continuous, equal interval, absolute zero). The next step is to pilot the items, review the pilot data, and revise as needed. Once revisions are made, additional pilots or tests are typically run to determine the final set of test items for the instrument (Lambert et al., 2006; Wilson, 2005).

Test developers based item selection for the PALS-PreK (Invernizzi et al., 2004) on the following factors.

- Extensive review of scientific research in the area of emergent literacy to determine core components.
- Items created in each core area were required to meet the criteria of: (1) appropriate difficulty level for preschoolers, (2) documented links to later reading achievement, (3) stimuli successfully used previously to assess the intended area, and (4) predictive outcomes previously established using the stimuli.
- Feedback and recommendations on the items provided by the advisory review panel.
- Pilot studies to test child performance on items and collect suggestions for improvement.
- Item revisions, additions, and deletions followed by further pilots based on results.

- Examination of internal consistency to determine reliability of items, Guttman split-half reliability and Chronbach’s alpha were utilized to determine reliability coefficients on each task.

**Validation Procedures**

When designing measurement tools, one also considers the concept of validation throughout the process. Validating a measure is foundational to the assessment process. Messick (1993) suggested that validity is not about the instrument itself, but about the interpretations of the scores and the uses of the tool. In simple terms, validity determines whether or not the instrument measures what it set out to measure and if the means of measurement are accurate (Golafshani, 2003). In the past, tests were considered to be either valid or not, based on correlations with an external criterion. This static view of validity was present in the early to mid-20th century, before the *1966 Standards for Educational and Psychological Testing* were published.

However, with the release of the *Standards*, the focus of validity underwent a transformation. Prior to the *Standards*, measurement experts proposed what was referred to as a “trinity” or “trinitarian” view of validity. This view suggested that three main types of validity existed: content validity, construct validity, and criterion-related validity (comprised of predictive and concurrent validity). Content validity was defined as the degree to which the items were representative of the underlying content. Construct validity was described as the extent in which a test measures a psychological construct or trait. Criterion validity involved the relationship between the test variable (i.e. scores)
and another criterion outcome. Representing measures of criterion-related validity, predictive validity was defined as the correlation between the test variable and performance on a future criterion. Concurrent validity was described as the correlation between the test variable and another current measure. During the time of the trinity view, it was believed that inclusion of multiple types of validation procedures provided for the most technically sound assessments and that multiple interpretations surrounding validity could be made from test scores (Cizek, Rosenberg, & Koons, 2008; Ellis & Blustein, 1991; Sattler, 2000).

Since the time of the trinitarian view, the focus has shifted to a more unified perspective, suggesting that separate kinds of validity do not exist. This unified view implies that validity is a single, continuous construct made up of various types of evidence. The analysis and synthesis of this evidence allows individuals to create an integrated impression of an instrument’s validity. The current view, as stated in the 1999 Standards, is termed the “unitary” or “unificationist” view of validity. Even with the drastic changes over the years regarding aspects of validity, there is consensus among the American Educational Research Association, American Psychological Association, and the National Council on Measurement that test developers and evaluators should consider validity to be the most important factor in test development (Cizek et al., 2008; Goodwin & Leech, 2003).

Along with the agreement that validity is a fundamental component in test development and evaluation, there is also a common belief that there are several key features of validity. There is growing consensus among measurement specialists that it is not the instrument or the scores that are validated, but the inferences that can be made
from the results of the measurement (Kane, 2006). However, there remains some
disagreement in regards to the sources of validity evidence deemed most appropriate for
sound psychometric measures.

Cizek et al. (2008) reviewed 283 tests designed for various purposes. The goal of
the study was to determine which types of validity evidence were most prevalent across
types of tests and the extent to which multiple sources of validity evidence were utilized.
The tests were coded based on type of test, validity characteristics, sources of validity
evidence, and overall evaluation of the test by the coder. The sample of tests was
diverse, with aptitude tests, followed by achievement, then psychological tests
representing the largest categories.

Results indicated that only seven of the 283 studies reviewed validity using the
unitary perspective, while only 27 studies referred to or cited the 1999 Standards. The
major sources of validity evidence represented in the sample were: construct ($n = 164$),
criterion-related ($n = 190$, 46 predictive and 144 concurrent), and content ($n = 137$). The
authors reported that the sources of validity evidence did not significantly vary across the
types of tests.

A moderately strong relationship was found between the overall evaluation of the
test by the coder (i.e., the quality of the test) and the number of validity sources. The
coders generally rated those with more sources of validity evidence more positively.
Finally, it was reported that of the 283 tests in the study, 81 assessments included only
one source of validity evidence, 92 tests included two, and 73 tests included three types
of validity evidence. Only 16 studies included four sources. These results suggest that
while there is agreement upon measurement experts regarding the modern unitary view of

When constructing and validating psychological or educational measures, the *1999 Standards* (AERA, APA, & NCME, 1999) suggest that one needs to engage in traditional methods of scientific inquiry to develop high quality measures. During test construction, developers should explicitly state their inferences and support inferences with rigorous data collection via established research methods. By utilizing the *Standards*, tests developers are provided with guidelines for establishing validity evidence and technical value. The *Standards* suggest utilizing multiple sources of validity evidence including evidence based on test content, response process, internal structure, relationships to information of other variables, and consequences of the measure (Ellis & Blustein, 1991; Wilson, 2005).

The PALS-*PreK* (Invernizzi et al., 2004) underwent multiple validity studies in order to establish various sources of validity.

- Content validity studies to determine the level in which the items were representative of the overall content.
- Construct validity studies to identify the underlying traits of the items and the extent to which the items reflected the underlying construct (emergent literacy). The results demonstrated a single factor, suggesting the PALS-*PreK* measures a unitary construct.
• Criterion-related validity studies to determine the extent to which the scores on the PALS-PreK correlated with external measures; includes concurrent and predictive validity.
  
o  Concurrent validity studies were completed to correlate scores on the PALS-PreK with three independent established measures ($r$ ranged from .41 to .67, $p < .01$).
  
o  Predictive validity studies were conducted to measure the ability of the PALS-PreK to predict performance on a later administration of the assessment. This was established via a correlational study ($r$ ranged from .53 to .91, $p < .01$) and multiple regression analysis ($R^2$ ranged from .305 to .84).

Reliability

Educators need psychometrically sound testing instruments that yield valid and reliable data useful for the intended purpose. Reliability refers to the consistency with which a test measures a given construct. Mindes (2007) defined reliability as the consistency, dependability, or stability of test results. Tests need to be reliable so that educators can take results from one assessment and be confident that they could be replicated under similar circumstances (Crocker & Algina, 2006). The four widely reported forms of reliability include: (a) alternate form reliability, (b) test-retest reliability, (c) internal consistency, and (d) inter-rater reliability.

The reliability index is reported as a correlation coefficient, which measures whether two constructs are related to one another and the level of the relationship between the constructs (Cohen, Manion, & Morrison, 2001). Correlation coefficients can
range from +1.00 to -1.00. The closer the correlation is to +1 or -1, the stronger the relationship. Positive coefficients indicate positive relationships (i.e. as scores on one test increase, scores on the other test increase) and negative coefficients indicate negative relationships (as scores on one test increase, scores on the other decrease). A correlation does not imply that one variable caused the other, simply that there is a relationship between the two (Chronbach, 1984; Hinkle et al., 2003; Mindes, 2007).

**Multiple test administrations.**

The ability to generalize items on one test to similar items on another test is termed alternate form reliability. Constructing two or more similar forms of a test and administering it to the same participants within a short time period allows one to establish alternate form reliability. The administration of alternate forms should be randomized and counter-balanced. A correlation coefficient, also called the coefficient of equivalence, is calculated to compare the subject’s scores on the first form to the scores on the second. The higher the correlation coefficient, the more confident the user can be that alternate forms of the test would produce generally equivalent results. The correlation between the alternate forms should be high to deduct that the content on each is equivalent (Crocker & Algina, 2006; McAfee & Leong, 2007).

Test-retest reliability compares the results of a single assessment given at different times to the same subject. One form of a test may be sufficient for the intended purpose, however the test developer may want to determine how consistently the subject performs on the test at various times. When establishing test-retest reliability, the test developer administers the test to a group of subjects then after an elapsed time period administers the same test again to the same group. The amount time recommended
between test administrations varies depending on the purpose and intent of the test (can range from several days to years). A correlation coefficient is computed based on a comparison of the scores from the first administration with scores from the second administration. The results should remain relatively consistent over time, suggesting accuracy and reliability. By calculating a correlation coefficient, comparisons can be made between the subject’s scores on the first and second test administrations. This coefficient is referred to as the coefficient of stability (Crocker & Algina, 2006; Mindes, 2007).

**Single test administrations.**

Internal consistency demonstrates the extent to which items of a test correlate with one another. Multiple internal consistency procedures exist to statistically estimate reliability; resulting in correlations between separately scored items or portions of a test. Split-half methods are used to measure item homogeneity or consistency across items. Split-half investigates internal consistency via a randomly separating the test items in half and comparing the relationship between the two separate sets of items to obtain a reliability coefficient.

Item covariance methods are used to estimate internal consistency by investigating inter-correlations among test items. The inter-correlations increase when all test items measure a similar construct. One item covariance procedure frequently utilized to determine internal consistency is Cronbach's alpha, which is mathematically equivalent to the average of all possible split-half estimates. Chronbach’s alpha is used as an index to measure internal consistency by analyzing the average correlations of the items within
the test (Chronbach, 1984; Crocker & Algina, 2006; Mehrens & Lehmann, 1987 in Invernizzi et al., 2004).

Inter-rater (also known as inter-scorer) reliability refers to the likelihood that two individuals assign a subject the same scores on a test (Mindes, 2007). Inter-rater reliability is established by having two individuals independently score a group of subjects on the same test, determining the extent to which the individuals would assign each subject similar scores. Cohen’s kappa is frequently used to establish an inter-rater reliability coefficient by examining the proportion of agreement between the rater’s scores. High coefficients of reliability indicate subjects are ranked consistently by two or more individual raters on the test (Hubbard, 1998; Invernizzi et al., 2004).

The PALS-PreK (Invernizzi et al., 2004) utilized reliability methods to determine the consistency in which the PALS-PreK measured the construct.

- Internal consistency studies were completed to examine the reliability of the PALS-PreK using Guttman’s split-half reliability ($r$ ranged from .71 to .94) and Chronbach’s alpha level ($r$ ranged from .77 to .93).
- Inter-rater reliability studies were conducted to determine extent to which two separate individuals would score the PALS-PreK the same, represented by a correlation coefficient ($r = .99$).

**Pilot testing.**

The need for and purpose of pilot testing has been indicated throughout the present discussion of instrument development. Pilot testing allows researchers to test and refine the tool by completing preliminary trials on the questions, protocols, and techniques. When creating test items, piloting of the items allow the developer to determine any
items demonstrating overlap, redundancy, lacking relevance, or perhaps unclear, overly difficult, or simple. This allows for revisions to be made and further piloting to take place prior to large-scale implementation. Pilot studies can provide additional valuable information such as examinee reports of item peculiarities. Typically simple descriptive statistics are calculated using the pilot data to determine general item difficulty and performance on the measure.

Unfortunately, in early childhood settings, the examinee him/herself is not often an appropriate source for feedback. Due to the young age of children in early childhood programs, the subjects being tested are unable to directly provide adequate and appropriate feedback regarding the instrument (i.e. completing a survey). However, the examiner can keep a record of the children’s responses or comments regarding the tool for further investigation. For example, a child may comment that a picture for one of the items looks like a horse, when it was in fact intended to be a goat. In this case, the examiner could take observation this into consideration when making revisions and create a clearer representation of the goat. Observations and informal response analyses can provide valuable information for revisions. In order to gain more precise information, the test developer can engage in statistical procedures to assess the value of the instrument (Creswell, 2007; Lambert et al., 2006).

Psychometric methods are often used in test development to assess the value of the instrument’s items using factor analysis. Factor analysis is used to find patterns in the relationships among the variables with the goal of discovering characteristics about the independent variable that may be affecting the dependent variable. Through differentiating a set of variables, one can investigate patterns in their relationships to one
another to make decisions regarding the test. Through a factor analysis test developers can determine component abilities or major factors that underlie performance on latent constructs of the test.

By engaging in factor analysis, the researcher or developer is able to determine the extent to which multiple items measure latent construct of interest. Items with higher correlations with the total score for the latent construct and with mean scores falling within the middle of the response distribution are then retained. Factor analysis allows the test developer to have multiple items measuring an attribute in order to result in the most optimal measurement. Larger numbers of items for each latent construct result in improved measurement due to increased information gathered.

In sum, pilot studies allow test developers to determine the need for any revisions, modifications, exclusions, or additions to the test itself as well as the data collection process or procedures. Engaging in one or more pilot studies prior to beginning large-scale implementation is an essential element of test development, allowing the researchers to ensure that the test and subsequent studies are worthwhile and merit pursuing (Lambert et al., 2006; Pelligrino & Chudowsky, 2003).

The PALS-PreK (Invernizzi et al., 2004), as briefly outlined previously, underwent multiple pilot studies during the test construction process.

- Pilot 1 Goal: To gain information on children’s (n= 56) performance on the PALS-PreK and evaluate the administration procedures. Pilot 1 resulted in revisions to two PALS-PreK tasks, addition of two additional tasks, modification of stimulus items, and addition of an administration booklet.
- Pilot 2 Goal: Assessment of a larger number of children (n= 251) representative of the larger population in regards to variables such as ethnicity and socioeconomic status. The pilot resulted in further additions and modifications to the PALS-PreK items and test materials.

- Pilot 3 Goal: Examination of various formats for specific tasks, to determine the need for additional pilot studies, and establish necessary psychometric properties (n= 287).

- Pilot 4 Goal: Test and confirm all changes made on the original PALS-PreK tasks, examine item-level statistics, and conduct inter-rater reliability and concurrent validity studies (n= 138).

**Early Literacy Progress Monitoring Assessment Tool**

The *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009) is a novel instrument in the field of emergent literacy currently undergoing development. The intent of the ELP-MAT is to be a contextually and developmentally appropriate early literacy progress monitoring assessment tool, thus meeting a need in the field. The purpose of the ELP-MAT is to identify children during their preschool years who are at risk for later reading failure and to provide intervention at the earliest point appropriate, to “catch them before they fall” (Torgeson, 1998), while continuously monitoring emergent literacy development (Kaderavek).

The ELP-MAT (Kaderavek, 2009) is composed of twenty-five test items across four domains. The domains measured are: (a) print knowledge, (b) phonological awareness, (c) alphabet knowledge, and (d) emergent writing. These four domains were specifically chosen because of their strong correlation with conventional literacy
development (Justice, 2006; NELP, 2004). Having access to an authentic assessment and progress-monitoring tool, appropriate for early childhood settings, provides educators with the tools to effectively engage in the response to intervention process as outlined previously. If validated, the ELP-MAT will provide valuable information by screening all children to identify those who are at-risk and/or showing delays in emergent literacy skills and in need of intervention. The specific areas of deficit can then be analyzed for intervention planning and subsequent administrations of the ELP-MAT completed for progress monitoring purposes (Kaderavek).

By utilizing the ELP-MAT (Kaderavek, 2009), teachers and other professionals will be able to target children who are falling behind in early literacy development to provide additional supports and interventions. The ELP-MAT is not only intended to identify children who are falling behind and assist in intervention planning but to be used as a progress monitoring tool once interventions have been instituted (Kaderavek). In order to determine that the ELP-MAT is an appropriate tool for use in early childhood settings within the RTI framework, certain parameters must be explored. Central to these parameters is the investigation and documentation of psychometric properties, including sources of validity evidence

**Summary of Relevant Literature**

Emergent literacy skills have consistently been identified in educational literature and research as important precursors to conventional literacy development, affecting later academic achievement and social adjustment (Kaminski & Good, 1996; Lonigan et al., 2000). It has been reported that as many as one in six children experience early reading difficulties. Due to the large numbers of children demonstrating deficits in literacy
acquisition, educators are expected to integrate evidence-based practices into the classroom regarding instruction, assessment, and intervention.

Children with speech or language impairments are at significant risk for delays in literacy acquisition. There is evidence that if these delays are identified during early childhood, intervention provided, and progress closely monitored, it may be possible to prevent or minimizing later reading difficulties resulting in improved long-term academic outcomes. Fuchs and Fuchs (2007) advise that it is essential to closely monitor the effects of the interventions via ongoing assessment to determine any needed modifications or adaptations. Ongoing assessment requires appropriate and effective assessment tools, permitting educators to engage in data based decision-making.

Current emergent literacy assessment tools are not useful for effective progress monitoring in early childhood settings, creating a need for an authentic, contextually relevant tool. The Early Literacy Progress Monitoring Assessment Tool (ELP-MAT; Kaderavek, 2009) is currently undergoing the test construction process to remedy the limitations of existing tools. The ELP-MAT, once determined to be a psychometrically sound instrument, will provide early childhood educators with opportunities to engage in a fluid process of preventative assessment, intervention, and progress monitoring (Carta et al., 2008; Hagans-Murillo, 2005; ODE, 2008).

**Research Questions**

1. Are scores on the Early Literacy Progress Monitoring Assessment Tool (ELP-MAT; Kaderavek, 2009) significantly related to scores on the Test of Early Reading Ability, Third Edition (TERA-3; Reid et al., 2001)?
2. Are scores on the ELP-MAT significantly related to scores on the phonological awareness (PA) subtest of the *Test of Preschool Early Literacy* (TOPEL; Lonigan et al., 2007)?

3. Do scores on the ELP-MAT differentiate between two groups of children, those with diagnosed speech/language impairments and those who are typically developing?
Chapter Three

Methodology

The purpose of this study was to determine whether the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009) demonstrated good preliminary evidence of concurrent validity, providing justification for further research regarding use in early childhood settings. In addition, this study sought to determine whether the ELP-MAT was able to effectively discriminate between two groups of children based on diagnosed language impairments. Investigation into these parameters took place in the study by addressing the following research questions and hypothesized outcomes.

1. Are children’s scores on the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT) significantly related to his/her scores on the *Test of Early Reading Ability, Third Edition* (TERA-3; Reid et al., 2001)?

   *It was hypothesized that participant’s overall raw scores on the ELP-MAT would be significantly related to their overall composite raw scores on the TERA-3.*

2. Are children’s scores on the phonological awareness subtest of the ELP-MAT significantly related to his/her scores on the phonological awareness (PA) subtest of the *Test of Preschool Early Literacy* (TOPEL; Lonigan et al., 2007)?

   *It was hypothesized that participant’s raw scores on the PA subtest of the ELP-MAT would be significantly related to their raw scores on the PA subtest of the TOPEL.*
3. Do scores on the ELP-MAT differentiate between two groups of children, those with diagnosed language impairments and those who are typically developing?

*It was hypothesized that the ELP-MAT mean performance between the typically developing participants and the language-impaired participants would be significantly different.*

**Research Design and Study Overview**

In this study, a quantitative research design was employed to determine the strength and relationship between the variables, children's raw scores on the ELP-MAT (Kaderavek, 2009), the TERA-3 (Reid et al., 2001), and the TOPEL (Lonigan et al., 2007) phonological awareness (PA) subtest. The relationship was examined using the Pearson product-moment correlation coefficient to determine existing patterns in the data and the extent to which the data sets were related. An independent t-test was also utilized to compare means between the children in the typically developing group to those of the children in the language impaired group to determine if significant differences in scores were present between the groups (Hinkle et al., 2003).

**Participants**

The participants included 60 preschool children being educated in early childhood programs within three local northwest Ohio school districts, specifically Wood County. The participants ranged in age from 3 years 6 months to 5 years of age and included 41 males and 19 females. Thirty of the children were typically developing (19 males, 11 females) and 30 were diagnosed with language impairments (22 males, eight females). All 60 participants spoke English as a primary language and had current hearing screenings reporting results within normal limits.
The mean age of the typical group was 4 years 5 months while the mean age of the language impaired group was 4 years 2 months. Parents and teachers reported the children in the typical group were demonstrating age appropriate skills, coupled with scores within the average range on classroom developmental screenings.

The children in the language-impaired group were all receiving special education services due to a primary educational diagnosis of speech or language impairment. The language-impaired children presented with moderate to significant delays in expressive communication, indicated by standard scores on a norm-referenced communication assessment.

Using information collected from the student data sheet (see Appendix A), a General Index of Socioeconomic Status (SES) was computed for each participant by using suggested scores and weights from Hollingshead’s 4-factor Index of Social Status. The scores and weights used in the 4-factor index are assigned by documenting parental education level and occupation, resulting in a SES Index score for each participant (Hollingshead, 1975). An independent t-test was utilized to compare the mean Index of the typical group ($M = 47.67, SD = 11.15$) to the mean Index of the language impaired group ($M = 46.32, SD = 11.79$). The independent t-test data, $(t = .46, p = .553)$, provide evidence that there was not a significant difference in SES between the typical group and the language impaired group. Thus, variance in results of the study between the two groups should not be attributed to differences in SES. Additional participant and SES data is summarized in Table 3.
Table 3

*Descriptive Information for Typically Developing (TD) and Language Impaired (LI) Participants*

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>TD</th>
<th>LI</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age in months</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M$</td>
<td>53</td>
<td>50</td>
<td>51.5</td>
</tr>
<tr>
<td>$SD$</td>
<td>5.46</td>
<td>5.79</td>
<td>5.63</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>22</td>
<td>41</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td><strong>SES Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M$</td>
<td>47.67</td>
<td>46.32</td>
<td>47.00</td>
</tr>
<tr>
<td>$SD$</td>
<td>11.15</td>
<td>11.79</td>
<td>11.47</td>
</tr>
</tbody>
</table>

*Note: SES Index is based on Hollingshead’s 4-factor Index of Social Status (Hollingshead, 1975).*

**Instruments**

In this study, concurrent validity measures were established by assessing the participants with the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009) and two other measures, the *Test of Early Reading Ability, Third Edition* (TERA-3; Reid et al., 2001), and the *Test of Preschool Early Literacy* (TOPEL; Lonigan et al., 2007) phonological awareness (PA) subtest. In order to collect validity evidence in regards to the strength and direction of the relationship between the
measures, a correlational study was conducted utilizing the TERA-3 and the TOPEL PA
subtest as the comparative measures or “criterion” variables (Hinkle et al., 2003).

**Early Literacy Progress Monitoring Assessment Tool.**

The *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009) is composed of 50 test items across four domains for a total of 73 possible points. The domains measured are: (a) print knowledge, (b) phonological awareness, (c) alphabet knowledge, and (d) emergent writing. These four domains were specifically chosen because of their strong correlation with conventional literacy development (Justice, 2006; NELP, 2004).

The ELP-MAT (Kaderavek, 2009) is administered during a natural and socially relevant activity, an adult-child shared book reading. “Max Finds His House” (see Appendix B) is a short story written for the ELP-MAT to intentionally target the specific literacy skills and concepts outlined above. During the shared book reading, probes are presented to the child by the examiner, responses recorded, and a score awarded based on the child’s response. Scoring varies based on the domain and task being assessed. Individual domain raw scores are calculated by summing the points in each domain. A total raw score is obtained by summing the total points across the domains. The ELP-MAT assessment protocol is shown in Appendix C.

In the *phonological awareness* (PA) domain, there are three items addressing sound blending; sound blending items are scored on a 0-3 scale. For PA items, a score of 3 represents a correct response on the first trial, a 2 is awarded when the child responds correctly on the second trial after provided with a prompt, a 1 is received when the child attempts to blend the sounds but does so incorrectly, and a 0 represents an incorrect
response (i.e., child does not respond or child does not attempt to blend sounds). The remaining two items in the PA domain (rhyming) are scored on a 0-2 scale. The child receives a score of 2 if he/she provides the correct response on the first trial, a score of 1 is awarded if a correct response is provided on the second trial after a prompt, and a score of 0 is recorded if the child does not respond correctly, even after the prompt.

The print knowledge domain consists of 20 items. Seven items are scored on a 0-2 scale as outlined above. The remaining 13 items in the print domain are based on a 0-1 scale, where the child is awarded 1 point if he/she responds correctly and 0 points if the correct response is not provided. The alphabet knowledge domain consists of labeling all 26 letters of the alphabet, which are presented in random order. The child is awarded 1 point for a correct label and 0 points for an incorrect label or failure to respond.

The examiner scores the task in the writing domain by analyzing the child’s written representation of his or her name. Scores range from 0 (scribbling without intention) to 7 (name written correctly with no backwards letters or mirror images). The scoring guidelines used for the ELP-MAT writing task were adapted from those utilized in the PALS-PreK (Invernizzi, 2004), representing the developmental stages children proceed through as they learn to write. The name writing scoring sheet utilized in the PALS-PreK is shown in Appendix D.

**Test of Early Reading Ability, Third Edition.**

The Test of Early Reading Ability, Third Edition (TERA-3; Reid et al., 2001) is a measure of early literacy skills for children ages 3 years 6 months to 8 years 6 months. The TERA-3 was chosen as a criterion measure for this study due to its strong technical
qualities and widespread use by early childhood professionals. The psychometric properties of the TERA-3 are summarized in Table 4.

The examiner administered the TERA-3 (Reid et al., 2001) in a 1:1 testing situation, following standardized instructions outlined in the examiner's manual. The assessment is comprised of three subtests: **Alphabet, Conventions, and Meaning**. Children are administered a set of items from each subtest using entry points (based on child’s chronological age), basals (three passed items), and ceilings (three missed items). Scoring is completed by assigning 1 point for a correct response and 0 points for an incorrect response. By summing the item scores for each subtest, examiners calculate individual raw scores and standard scores for each of the subtests. Subtest scores are combined to obtain a **Reading Quotient** score, reflecting the child’s overall reading ability (Reid et al.). A detailed description of each subtest is in Table 1.

**Test of Preschool Early Literacy.**

The **Test of Preschool Early Literacy** (TOPEL; Lonigan et al., 2007) is a theoretically sound instrument designed to assess early literacy skills in children ages 3 through 5 years of age. The TOPEL is intended to identify children who are at-risk for literacy development and to monitor early literacy progress. While the TERA-3 (Reid et al., 2001) measures alphabet knowledge, print conventions, and print meaning, it does not measure phonological awareness, an essential component of early literacy. Therefore the TOPEL **phonological awareness (PA)** subtest was chosen for this study, to be utilized in addition to the TERA-3, to provide a measure of phonological awareness. The TOPEL PA, as does the TERA-3, demonstrates high degrees of reliability and evidence of moderate levels of content, criterion, and construct validity (see Table 4 for psychometric
properties). The authors contend that the TOPEL is a reliable and valid measure of early literacy abilities and can be used with confidence to assess the literacy development of young children (Lonigan et al.).

The TOPEL (Lonigan et al., 2007) PA subtest is administered individually, following standardized instructions per the examiner’s manual. The PA subtest is made up of four item sets (A, B, C, & D), for a total of 27 items. Each set begins with two practice items in which the examiner is able to provide structured cuing. Item sets A and C use illustrations to assess the PA concepts, while sets B and D are administered without pictures. Testing commences in each item set and continues until a ceiling of three incorrect responses is reached or all items in the set are administered. The same administration procedures are used for all item sets, regardless of errors on the previous set. Scoring is completed by assigning the child 1 point for a correct response or 0 points for an incorrect response. Raw scores are then obtained for each item set and summed to obtain the PA subtest score.

After investigation of the psychometric properties and skill areas probed, it was determined that the TERA-3 (Reid et al., 2001) and TOPEL (Lonigan et al., 2007) PA subtest were appropriate instruments for the assessment of early literacy abilities in young children. Therefore, these tools were chosen as criterion measures for this study to establish a preliminary measure of concurrent validity for the ELP-MAT (Kaderavek, 2009). Through comparison of children’s scores on the ELP-MAT, the TERA-3, and the TOPEL PA subtest, concurrent-type validity was established via a Pearson correlation coefficient ($r$). Ideally, the goal of the study was to determine a high level of correlation between children’s scores on the ELP-MAT, the TERA-3, and the TOPEL PA to provide
preliminary evidence that the ELP-MAT demonstrates good concurrent validity with other instruments used for assessing emergent literacy skills (Goodwin & Leech, 2003).

Table 4

*Reliability and Validity Data for Norm-Referenced Tests*

<table>
<thead>
<tr>
<th>Norm-referenced Tests &amp; Subtests</th>
<th>Subtest Skills Measured</th>
<th>Reliability &amp; Validity Data for Each Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Content Validity</td>
</tr>
<tr>
<td>TERA-3 Composite</td>
<td></td>
<td>.95</td>
</tr>
<tr>
<td>TERA-3 Alphabet</td>
<td>Knowledge of alphabet &amp; sound-letter correspondence</td>
<td>.91</td>
</tr>
<tr>
<td>TERA-3 Conventions</td>
<td>Comprehension of meaning of printed material, including words, sentences, and paragraphs</td>
<td>.83</td>
</tr>
<tr>
<td>TERA-3 Meaning</td>
<td>Ability to comprehend the meaning of printed material</td>
<td>.90</td>
</tr>
<tr>
<td>TOPEL Composite</td>
<td></td>
<td>.96</td>
</tr>
<tr>
<td>TOPEL Phonological Awareness</td>
<td>Ability to manipulate sounds that form common words</td>
<td>.87</td>
</tr>
</tbody>
</table>

*The term *inter-scorer* is used in the TERA-3 manual rather than *inter-rater*.  
*The term *time sampling* is used in the TERA-3 manual rather than *test-retest.*

Adapted from Lonigan et al. (2007) and Reid et al. (2001)
Procedures

Recruitment

Recruitment flyers (Appendix E) and letters of consent (Appendix F) were sent to the parents of children enrolled in local integrated preschool programs in Northwest Ohio. Integrated preschool programs are early childhood classrooms composed of children three to six years of age, who are both typically developing as well as those identified with disabilities. The children with disabilities are provided special education services and supports in the integrated preschool setting. All children, regardless of special education status, were exposed to the same early childhood curriculum and classroom experiences.

A total of 125 preschool students were recruited to participate in the study. Participation was voluntary, based on parent consent. Student identities were kept confidential by assigning each student an identification code. Eligible participants were recruited based on age and eligibility for one of two groups as a typically developing or language impaired student.

In order to be recruited for participation in the typically developing group, children had to meet the following criteria: (a) enrolled in an integrated preschool program as a typically developing student, (b) primary English-language speaker, (c) chronological age between 3 years 6 months and 5 years 0 months, and (d) scored within the average range on classroom developmental screenings of cognition and communication. Recruitment flyers and consent forms were sent to a total of 75 children eligible for participation in the typically developing group.
Recruitment for participation in the language impaired group was based on the following criteria: (a) enrolled in an integrated preschool program as a child with a disability, (b) primary disability category of speech or language impairment, (c) disability not due to any other factors or conditions (i.e. diagnosis of autism), (d) primary English-language speaker, and (e) chronological age between 3 years 6 months and 5 years 0 months. All children, typical and language impaired, had current hearing screening results indicating no concerns or impairments present. A total of 50 children eligible for the language-impaired group were recruited.

**Group selection.**

The study aimed to have at least 30 participants in each group, with a balanced ratio of typical children to language impaired children. It was predetermined that if more than 30 consent forms were received for either group, simple random sampling techniques would be utilized to select equal numbers of children to participate in each group. Fifty-two consent forms were received for typically developing children (75 forms were sent out to children who were typically developing) and 30 consent forms were received for language-impaired children (only 50 forms were sent as the potential pool of children meeting the LI criteria was more limited). The percentage of acceptance was similar for both groups, averaging between 60-70%. Sampling techniques were employed for the typically developing group resulting in the N of 30. All language-impaired participants were included in the study. Once participants were selected for the study, the researcher sent out a letter and student demographic information sheet to the parents. An example of the parent letter and demographic information sheet are provided in Appendices G and H.
Inter-rater reliability.

Ten percent of the assessments were randomly selected for reliability coding. A second researcher independently analyzed and scored 10% of the TERA-3, TOPEL PA, and ELP-MAT administrations using audio recordings and supplemental score sheets. The assessor used the supplemental score sheets to document any non-vocal participant behaviors (i.e., pointing, turning page, etc.). Point-by-point agreement for each item was established by dividing the total number of agreements by the total number of agreements plus disagreements and then multiplying by 100. Scoring reliability data are as follows: TERA-3 (97%), TOPEL PA (92%), and ELP-MAT (97%). Inter-rater agreements for all measures were excellent. Experts indicate that inter-rater reliability percentages 90% and above are satisfactory and indicate appropriate levels of inter-rater reliability (Anastasi & Urbina, 1997).

Assessment Protocol

Once consent was obtained and the participants were divided into the appropriate groups, data collection commenced. The researcher, a doctoral student and licensed school psychologist, tested all of the children individually. For the convenience of parents and the comfort level of the students, test administration was completed during the school day at the child’s regular preschool center. Total assessment time (for all three tools) was less than one hour per child.

To minimize maturation effects, data collection was conducted within a four-week period for each child. Test administration order was randomized and counterbalanced to guard against order effects on the results and possible administration bias. All assessments were composed of typical early childhood tasks (i.e. naming or
pointing to pictures, writing name, identifying letters, etc.). Table 5 shows the test combinations for the random administration order and number of participants for each.

The culturally appropriate nature of the assessment tasks was considered. The norm-referenced assessments (TERA-3 and TOPEL) have been systematically evaluated and determined appropriate for a culturally diverse population of children, representative of the nation as a whole (Lonigan et al., 2007; Reid et al., 2003). It is hypothesized that the ELP-MAT minimizes the effects of children’s cultural differences because the ELP-MAT (a) uses animals as characters (as opposed to drawings representing a specific cultural group) and (b) is administered in a familiar context, adult-child shared book reading, appropriate for a culturally diverse group of children (NAEYC, 2003).

Table 5

*Administration Order of ELP-MAT, TERA-3, and TOPEL Tests*

<table>
<thead>
<tr>
<th>Random Administration Order</th>
<th>Test Order</th>
<th>Number of Participants per Administration Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Typical</td>
</tr>
<tr>
<td>1</td>
<td>ELP-MAT, TERA-3, TOPEL</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>ELP-MAT, TOPEL, TERA-3</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>TERA-3, ELP-MAT, TOPEL</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>TERA-3, TOPEL, ELP-MAT</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>TOPEL, TERA-3, ELP-MAT</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>TOPEL, ELP-MAT, TERA-3</td>
<td>6</td>
</tr>
</tbody>
</table>
Norm-referenced Administration

The TERA-3 (Reid et al., 2001) and the TOPEL (Lonigan et al., 2007) are both norm-referenced, standardized, assessment tools designed for administration to preschool aged children. All three subtests of the TERA-3 (Alphabet, Concepts of Print, and Print Meaning) were administered as well as the Phonological Awareness (PA) subtest of the TOPEL. The total administration time for the norm-referenced assessments was approximately 20-30 minutes per child for the TERA-3 and 10-15 minutes for the TOPEL PA subtest.

The TERA-3 (Reid et al., 2001) and the TOPEL (Lonigan et al., 2007) PA subtest were administered and scored per specified standardized instructions outlined in the examiner’s manuals. The children were individually administered the norm-referenced assessments, during separate testing sessions for each instrument. All children from both the typical group and the language-impaired group were assessed over a four-week period.

Progress Monitoring Administration

The ELP-MAT (Kaderavek, 2009) assessment also took place in the child’s preschool center during his/her regular school day. The ELP-MAT was administered to each child in one testing session, precisely following the instructions and guidelines specified on the protocol form of the ELP-MAT. Total administration time for the ELP-MAT was approximately 10-15 minutes per child. All participants from the typically developing group and the language-impaired group were assessed over the same four-week period.

Data Management
Data analysis was conducted using the *Statistical Package for the Social Sciences Version 17* (SPSS, 2008) software to establish measures of concurrent validity (research questions one and two). Concurrent validity is typically reported as a correlation coefficient. Bivariate statistics were employed in order to calculate a Pearson correlation coefficient, to determine whether a linear relationship existed between scores on the ELP-MAT and scores on the TERA-3 and TOPEL PA subtest. The correlation coefficient describes the direction and strength of the relationship between the variables (Hinkle et al., 2003; Mindes, 2007).

Statistical analysis for the third research question was slightly different than that for questions one and two. In order to address the third research question, the SPSS software was utilized to run an independent t-test on the data from the two groups. Group means were compared to determine whether or not scores on the ELP-MAT were able to differentiate between students who are typically developing and those with language impairments. The independent t-test was chosen in order to determine whether the mean scores on the ELP-MAT of the typical group were significantly different from those of the language-impaired group, thus being providing evidence that the ELP-MAT was able to effectively differentiate between the two groups.
Chapter Four

Results

This study provided a preliminary analysis of concurrent and discriminative validity for the Early Literacy Progress Monitoring Assessment Tool (ELP-MAT; Kaderavek, 2009). The goals of the study were to: (a) determine if the variables measured by the ELP-MAT were consistent with those on well-established, norm-referenced measures (research questions one and two) and (b) determine if the ELP-MAT was able to differentiate between children with known risk factors for successful literacy acquisition (research question three).

The study included 60 participants ages 3 years 6 months to 5 years of age; the mean age was 4 years 3 months. The mean raw score on the ELP-MAT for the total sample was 37.37 (\(n = 60, SD = 17.67\)) with a range of 1 to 65. The mean score for the typical group was 48.10 (\(n = 30, SD = 10.60\)) with a range of 12 to 65. The mean score for the language-impaired group (\(M = 26.63, SD = 16.84\)) was significantly lower than that of the typical group with scores ranging from 1 to 61. Further interpretation and analyses of these data are reported in the following sections and summarized in Table 8.

Correlations between the ELP-MAT, the Test of Early Reading Ability-Third Edition (TERA-3; Reid et al., 2001), and the Test of Preschool Early Literacy phonological awareness subtest (TOPEL; Lonigan et al., 2007) were calculated in this study to estimate the concurrent validity of the ELP-MAT. Concurrent validity compares scores on one measure (the ELP-MAT) with current performance on other independently
established measures (the TERA-3 and the TOPEL PA subtests), resulting in a
correlation coefficient (Cizek et al., 2008; Ellis & Blustein, 1991; Sattler, 2000).

Bivariate statistics were used to calculate a Pearson correlation coefficient ($r$), explaining
the strength and direction of the relationships among the variables. Correlation
coefficients range from positive 1.00 to negative 1.00. The closer $r$ is to +1 or -1, the
stronger the relationship. Table 6 shows the interpretation of $r$ based on correlation size
(Hinkle, Wiersma, & Jurs, 2003; Mindes, 2007).

Table 6

*Interpretation Guidelines for Correlation Coefficients*

<table>
<thead>
<tr>
<th>Size of Correlation</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>.90 to 1.00 (-.90 to -.100)</td>
<td>Very high positive (negative) correlation</td>
</tr>
<tr>
<td>.70 to .90 (-.70 to -.90)</td>
<td>High positive (negative) correlation</td>
</tr>
<tr>
<td>.50 to .70 (-.50 to -.70)</td>
<td>Moderate positive (negative) correlation</td>
</tr>
<tr>
<td>.30 to .50 (-.30 to -.50)</td>
<td>Low positive (negative) correlation</td>
</tr>
<tr>
<td>.00 to .30 (.00 to -.30)</td>
<td>Little if any correlation</td>
</tr>
</tbody>
</table>

Adapted from Hinkle, Weirsma, & Jurs, 2003

**Research Question One**

To answer research question one, a macro-analysis was completed, examining
participant’s total raw scores on the ELP-MAT to composite raw scores on the TERA-3.

Results indicated that the correlation was high ($r = .87$, $p \leq .001$) with significance at the
.001 level. The effect size was large ($r^2 = .76$) implying that 76% of the total variance in
participant’s scores on the TERA-3 was associated with the variance in ELP-MAT scores.

To further explore research question one, the researcher also completed a micro-analysis, investigating relationships between individual ELP-MAT domains and corresponding TERA-3 subtests. The early literacy sub-skills that were considered included: (a) print knowledge and (b) alphabet knowledge.

First, in the micro-analysis examining print knowledge, children’s scores from the ELP-MAT Print Knowledge domain were correlated with summed subtest scores within the TERA-3’s Conventions subtest and Meaning subtest. The ELP-MAT Print Knowledge domain encompasses items represented by both TERA-3 subtests. Data analysis resulted in a high significant positive correlation \((r = .86, p < .01)\) between the ELP-MAT Print Knowledge domain and the sum of the TERA-3 Conventions and Meaning subtests. Second, in the micro-analysis examining the relationship between alphabetic knowledge tests, children’s scores from the ELP-MAT Alphabet Knowledge domain were correlated with scores on the TERA-3 Alphabet subtest \((r = .78, p \leq .001)\). Data revealed a high significant positive correlation when comparing the ELP-MAT alphabet and TERA-3 alphabet measures.

**Research Question Two**

To answer research question two, the researcher examined the relationship between the ELP-MAT PA domain and the TOPEL PA subtest. In this set of analyses, the goal was to consider whether the phonological awareness (PA) domains were significantly correlated by comparing children's scores on ELP-MAT PA domain and the TOPEL PA subtests. Data analysis revealed that children’s scores on the ELP-MAT PA
domain were significantly correlated with scores on the PA subtests of the TOPEL ($r = .70, p \leq .001$). Correlation coefficients comparing individual ELP-MAT domains to the TERA-3 and TOPEL PA subtests are reported in Table 7.

Table 7

*Concurrent Validity of the ELP-MAT with Norm-referenced Instruments*

<table>
<thead>
<tr>
<th>Norm-referenced Instrument</th>
<th>ELP-MAT Total</th>
<th>ELP-MAT Print Knowledge</th>
<th>ELP-MAT Phonological Awareness</th>
<th>ELP-MAT Alphabet Knowledge</th>
<th>ELP-MAT Writing</th>
<th>ELP-MAT Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TERA-3 Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.87***</td>
</tr>
<tr>
<td>TERA-3 Alphabet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.78***</td>
</tr>
<tr>
<td>TERA-3 Conventions &amp; Meaning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.73***</td>
</tr>
<tr>
<td>TOPEL Phonological Awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.70***</td>
</tr>
</tbody>
</table>

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

**Research Question Three**

To answer the third research question, the researcher examined the discriminative validity of the ELP-MAT. As discussed in previous chapters, discriminative validity refers to a measure’s ability to differentiate between two groups. The researcher
computed an independent t-test to determine if there was a significant difference between the typically developing children’s mean scores on the ELP-MAT as compared to the mean scores of the children with language-impairments. The presence of a significant difference is indicative of the ELP-MAT’s discriminative validity.

As reported previously, the mean raw score on the ELP-MAT for the total sample was 37.37 ($n = 60$, $SD = 17.67$) with a range of 1 to 65. The mean score for the typical group was 48.10 ($n = 30$, $SD = 10.60$) with a range of 12 to 65. The mean score for the language-impaired group ($M = 26.63$, $SD = 16.84$) was significantly lower than that of the typical group ($t = 5.90$, $p < .01$). A large effect size was noted ($d = 1.55$) indicating that the groups differed by 1.55 standard error units.

Fine-tuned data analyses found significant differences in all domains between the typically developing and the language-impaired group. Results demonstrated the ELP-MAT effectively differentiated between the two groups on measures of print knowledge ($t = 5.17$, $p < .05$), alphabet knowledge ($t = 4.73$, $p < .001$), phonological awareness ($t = 4.54$, $p < .05$), and writing ($t = 4.03$, $p < .001$). Effect sizes were all large with the value of $d$ ranging from 1.06 to 1.36. Independent t-test results are shown in Table 8.
Table 8  

*Discriminative Validity of the ELP-MAT for Participants who are Typically Developing (TD) and Children with Language Impairments (LI)*

<table>
<thead>
<tr>
<th>ELP-MAT Domains</th>
<th>Participant Group</th>
<th>Independent t Test Results</th>
<th>Effect size d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TD n = 30</td>
<td>LI n = 30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Print Knowledge</td>
<td>15.37</td>
<td>2.98</td>
<td>9.87</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td>5.67</td>
<td>3.08</td>
<td>2.30</td>
</tr>
<tr>
<td>Alphabet Knowledge</td>
<td>21.03</td>
<td>6.22</td>
<td>10.60</td>
</tr>
<tr>
<td>Writing</td>
<td>6.13</td>
<td>1.57</td>
<td>3.87</td>
</tr>
<tr>
<td>Total</td>
<td>48.10</td>
<td>10.60</td>
<td>26.63</td>
</tr>
</tbody>
</table>

* p \leq 0.05, ** p \leq 0.01, *** p \leq 0.001
Chapter Five

Discussion

The purpose of this study was twofold. First, the study examined the concurrent validity of the *Early Literacy Progress Monitoring Assessment Tool* (ELP-MAT; Kaderavek, 2009) by comparing children’s performance on the ELP-MAT with the *Test of Early Reading Ability, Third Edition* (TERA-3; Reid et al., 2001) and the *Test of Preschool Early Literacy* phonological awareness subtest (TOPEL; Lonigan et al., 2007). Second, the study examined the discriminative validity of the ELP-MAT to determine if the ELP-MAT effectively differentiated between groups of children with known risk factors for successful literacy acquisition.

In response to research question one, “Are children’s scores on the ELP-MAT significantly related to his or her scores on the TERA-3?” findings demonstrated that the ELP-MAT highly correlated with both subtest and composite scores on the TERA-3. The subtest scores on the TERA-3 are designed to measure children’s print awareness, conventions of print, and alphabet knowledge, while the composite score provides an overall measure of children’s early literacy skills. The ELP-MAT correlated most strongly with the composite score of the TERA-3, supporting that the ELP-MAT appears to be an effective measure of early literacy skills in preschoolers.

An examination of the relationship between scores on the ELP-MAT and the TOPEL phonological awareness (PA) subtest addressed research question two: “Are scores on the ELP-MAT significantly related to scores on the phonological awareness..."
(PA) subtest of the Test of Preschool Early Literacy?” The data indicated that children’s scores on the ELP-MAT strongly correlated with his or her scores on the TOPEL PA subtest, providing evidence that the ELP-MAT is an effective measure of phonological awareness.

Results regarding research question three: “Do scores on the ELP-MAT differentiate between two groups of children, those with diagnosed language impairments and those who are typically developing?” indicated a significant difference in the two groups. The data provides evidence that based on known risk factors the ELP-MAT is able to effectively identify children at-risk for difficulties in literacy development. This is an important element to consider, as most progress monitoring tools for young children are not sensitive enough to identify those who are at-risk for difficulties (McAfee & Leong, 2007). As discussed in Chapter 2, this is a critical component regarding the purpose and use of progress monitoring tools.

Results of the present study support the utility of the ELP-MAT as a progress-monitoring tool for measuring emergent literacy skills in both typically developing and language impaired preschoolers. An examination of validity evidence indicated that the ELP-MAT has high levels of concurrent and discriminative validity. These results provide support for the valid use of the ELP-MAT as a progress monitoring assessment tool for preschoolers. The results are encouraging, as there is a substantial need for an authentic early literacy progress monitoring tool that can be utilized in early childhood settings to assist in the prevention and remediation of literacy delays (Nichols, & Berliner, 2005; Nichols et al., 2005).
The use of the ELP-MAT speaks to the issue of *Response to Intervention* (RTI), the process of preventing learning difficulties by identifying areas of weakness and providing tiered levels of intervention. The successful implementation of the RTI framework in early childhood settings is dependent on the development and validation of appropriate and effective progress-monitoring assessment tools (Fuchs & Fuchs, 2006; Snyder et al, 2008; VenDerHeyden & Snyder, 2006). With effective tools, educators can quickly and efficiently identify students who require more intervention, target interventions based on identified weaknesses, and monitor students’ response to intervention. By utilizing appropriate progress monitoring tools as part of the RTI process, educators will demonstrate data-driven decision making for children (Walker et al, 2008).

These preliminary data demonstrate that the ELP-MAT has the potential to be an effective tool within the RTI model. The ELP-MAT demonstrated validity in assessing preschool children’s emergent literacy skills across four critical skill areas: print knowledge, alphabet knowledge, phonological awareness, and emergent writing (Justice, 2006). The findings of the study are noteworthy, as the ELP-MAT is the one of the first progress monitoring tools to use an authentic and natural task (adult-child shared book reading) to measure and monitor the emergent literacy skills of young children.

Due to the child-friendly structure of the ELP-MAT, an adult-child shared book reading task, most children responded favorably to the assessment. The majority of the children were comfortable and familiar with book reading activities and appeared confident during the assessment. When requested to “read a book” with the examiner, the children readily complied and often shared information regarding their personal book
reading experiences at home or in the classroom. In addition, while reading the ELP-MAT short story, “Max Finds His House,” many of the children related to the story, offering information about their own experiences (i.e., “My grandma’s dog has a dog house too.” or “I always wanted to have a dog.”). Children’s natural reaction to the story provided observational evidence that the ELP-MAT was perceived as a meaningful and relevant task.

The results from other researcher’s validity studies provide credence to the findings in this study. For example, Greenslade, Plante, and Vance (2009), evaluated the psychometric properties of an expressive language assessment, the *Structured Photographic Expressive Language Test- Preschool: Second Edition (SPELT-2).* Greenslade and her colleagues examined the SPELT-2’s concurrent validity by correlating children’s responses on the SPELT-2 with three other norm-referenced measures: (a) the *Test for Examining Expressive Morphology* (TEEM; Shipley, Stone, & Sue, 1983), (b) the *Test of Language Development—Primary: Third Edition* (TOLD-P: 3; Newcomer & Hammill, 1997), and (c) the *Kaufman Assessment Battery for Children—Second Edition* (KABC-2; Kaufman & Kaufman, 2004).

In the Greenslade et al. study, correlations ranged from .40 (low positive) to .86 (high positive). While the SPELT-2 strongly and significantly correlated with TEEM, the SPELT-2 demonstrated lower correlations with the TOLD-P: 3 and the K-ABC-II. Importantly, even though not all correlations were gauged as high, the authors summarized the results as supporting the concurrent validity of the SPELT-2. In comparison, the correlations from the current ELP-MAT study were all quite high (*r* = .70 to .87). As such, the interpretations of the data in the current paper are supported; the
ELP-MAT provides promising results pertaining to the development of a valid progress-monitoring tool.

A similar study, conducted by Wilson and Lonigan (2009), evaluated an emergent literacy screening tool for preschoolers, the Get Ready to Read! –Revised (GRTR-R; Whitehurst & Lonigan, 2010). Wilson and Lonigan examined the psychometric properties (test-retest reliability and concurrent validity) and utility of the GRTR-R by correlating participant’s scores on the screening instrument to scores on a norm-referenced diagnostic assessment, the Test of Preschool Early Literacy (TOPEL; Lonigan et al., 2007).

To examine test-retest reliability, the researchers administered the GRTR-R to participants on two occasions, first in July and again three months later in October. Participant’s scores from the initial administration were correlated with their scores from the second test administration ($r = .73, p < 0.001$). Results indicated that the GRTR-R showed a strong positive correlation between the first and second test administrations, indicating that participant’s scores on the GRTR-R remained relatively consistent over time, implying good accuracy and reliability of the tool (Crocker & Algina, 2006; Mindes, 2007; Wilson & Lonigan, 2009).

To examine concurrent validity, the researchers administered the TOPEL to all participants during the initial assessment and compared the children’s performance on the norm-referenced TOPEL to GRTR-R results. Correlation data between the TOPEL and the GRTR-R demonstrated significant positive correlations ranging from low to strong ($r = 0.43$ to $0.73$). Based on the results of the study, the authors indicated that the GRTR-R is a reliable and valid measure of emergent literacy skills in preschoolers.
The interpretations of Wilson and Lonigan (2009) provide further evidence that the results obtained in the current study of the ELP-MAT are significant; the correlations established for the ELP-MAT were higher than those reported in the Wilson and Lonigan study discussed above. In addition, the limitations of the tools discussed by the researchers (i.e., lack of item sensitivity and unnatural nature of tasks) were avoided in the ELP-MAT design. The ELP-MAT moves naturally at a comfortable pace for the child and does not contain timed items. The ELP-MAT has several items with hierarchal scoring to provide greater sensitivity for concepts that may be emerging (i.e., rhyming tasks). The results of the current study are promising considering the potential value of such a tool in early childhood settings.

**Limitations**

Authentic assessment of preschoolers’ emergent literacy skills is important in order to identify students who may need intervention. Although the ELP-MAT exhibited good preliminary evidence, this study represented only one step in the development of the instrument. Additional large-scale concurrent and discriminative validity studies should be conducted to continue the evaluation and revision process of the ELP-MAT.

The test-retest reliability portion of the study described above, conducted by Wilson and Lonigan (2009) documented a possible evaluation needed for the ELP-MAT. For example, a test-retest reliability study of the ELP-MAT could assess a group of children using the ELP-MAT on two separate testing occasions. Calculation of a correlation coefficient would document the relationship between children’s scores on the first and second test administrations. For example, one potential study design could assess children with the ELP-MAT at the start of the school year and again two to four
weeks later. The goal of the study would be to document evidence of stable scores across test administrations.

There are other limitations to the current study. First, the researcher served as examiner for all of the assessments, a factor that could result in potential bias (i.e., an internal validity issue). This study attempted to control for internal validity by conducting inter-rater reliability measures. However, further studies should train additional examiners to administer the ELP-MAT and document the consistency of administration between examiners.

A second limitation is the elapsed time between the administrations of each individual test for each child. Maturation is a concern, as children’s scores naturally improve over time. In this study, the researcher attempted to control for this effect by randomizing and counterbalancing test administration and completing all assessments within a brief time interval (i.e., all assessments were completed within a four-week period). Unfortunately, due to time constraints and child fatigue, it was impossible to administer all three assessments to each participant in one testing session.

A third limitation centers on the lack of subject diversity. The children in this study were all from northwest Ohio school districts and of similar socio-economic status (SES). The children within the individual groups were all of similar cognitive and language skills. While this was intentional to control for the influence of confounding variables, future research should expand the diversity of the sample to include a broader spectrum of ethnicities, SES, disability categories, and regions of the country.

The variation in ages of the participants and variations in individual attention to task also presented a potential limitation. Some children required more than one testing
session to complete the TERA-3 and/or the TOPEL PA subtest. While most children completed both tests in one session, several children required two sessions due to limited attention to the task, which may have influenced the results. However, assessment “best practice” suggests that shorter sessions are needed for some young children and that skilled examiners must always prioritize children’s needs and comfort with the assessment process (McConnell, Priest, Davis, & McEvoy, 2000; NAEYC, 2003).

Finally, the researcher noted that the youngest children in this study had difficulty comprehending and participating in some of the TOPEL PA tasks. This was especially true for the children with language impairments. As noted in Chapter 3, the TOPEL PA is constructed into multiple subsections, each requiring a separate basal and ceiling. Children who struggled with phonological awareness tended to show frustration on these tasks, resorting to guessing or requesting to be finished. The examiner observed that the children between 3 years 6 months to approximately 4 years appeared to have the most difficulty, as well as the children with more significant language delays. The observed behaviors likely mirror classroom performance, as children who struggle with literacy concepts in learning situation don’t participate as independently as his/her typical peers (Greenwood et al., 2002).

Differences in skills between age groups did not influence the overall results of the study, as each child was compared to him or herself when computing correlations. However, differences can contribute to large variation or range in scores within each group (typical and language impaired). In a classroom setting, teaching PA skills is generally implemented with adult scaffolding. Unfortunately scaffolding must be carefully controlled during administration of the standardized assessments.
Engaging in further research regarding the psychometric properties of the ELP-MAT will assist developers in addressing the limitations discussed. By completing additional studies, the ELP-MAT can be evaluated on a broader scale, utilizing a larger and more diverse sample. Exploring additional psychometric components generally included in test development would provide further validation of the ELP-MAT for use in early childhood settings. Additional components should include measures of: (a) content validity, (b) test-retest reliability, (c) inter-rater reliability, (d) predictive validity, and (e) construct validity. Conducting longitudinal studies, tracking student’s literacy development from preschool to kindergarten, would also provide valuable information regarding the usefulness of the ELP-MAT as a progress-monitoring tool.

This study represented an important early step in the initial validation and piloting of the ELP-MAT. Without demonstrating preliminary levels of efficacy, obtaining approval and funding for further studies is difficult if not impossible. This study provides promising results pertaining to the development of the ELP-MAT as a valid emergent literacy progress-monitoring tool.

**Summary**

There is a rising demand in the field of early childhood for assessment instruments that reliably and validly assess young children’s emergent literacy skills (Cabell, Justice, Zucker, & Kilday, 2009). The ELP-MAT was developed to address the need for a contextually and developmentally appropriate early literacy progress-monitoring assessment tool. The purpose of the ELP-MAT is to: (a) identify at-risk children during their preschool years to provide early intervention and (b) monitor young children’s emergent literacy development (Kaderavek, 2009). Results of the current
study established measures of concurrent and discriminative validity for the ELP-MAT, suggesting it is an appropriate progress-monitoring tool worthy of use with both typically developing and language impaired children in early childhood settings.

The ELP-MAT has the potential of assisting educators to engage in classroom-wide screenings of preschoolers, identifying those who are at-risk or not developing age-appropriate emergent literacy skills. The ELP-MAT can assist educators in targeting specific skills for intervention, implementing strategies to remediate deficits, and monitoring progress toward literacy acquisition. In summary, findings from the current study offer support that the ELP-MAT has successfully demonstrated evidence of good concurrent and discriminative validity across several variables. The ELP-MAT was found to be a valid and effective progress-monitoring tool, measuring emergent literacy using a natural and authentic task. The results of this study provide an encouraging outlook for not only the utility of the ELP-MAT, but for authentic progress monitoring of children at-risk for literacy failure in early childhood settings. The ELP-MAT will be able to assist educators in catching increasingly more children “before they fall” (Torgeson, 1998).
References


studies of reading, 9(2), 167-188.


reading practices for response to intervention (pp. 29-42). Baltimore: Paul H. Brookes Publishing Co.


Hollingshead, A. B. (1975). Unpublished working paper: Four factor index of social status. (Available from August B. Hollingshead, Yale University, Department of Sociology, P.O. Box 208265, New Haven, Connecticut 06520).


Educational Research and Improvement.


Ohio Department of Education (2008, September 25). *Pyramid of interventions framework for meeting the needs of all children.* Retrieved April 1, 2009, from [www.ode.state.oh.us](http://www.ode.state.oh.us)


Stahl, S. A. & Yaden, D. B. (2004). The development of literacy in preschool and


Appendix A

Parent Informational Letter
Dear Parents,

Thank you for considering having your child participate in the early literacy research study being conducted by the University of Toledo, Department of Early Childhood, Physical, and Special Education. If you give your permission for your child to participate, please sign the attached consent form and return to your child’s teacher in the enclosed envelope. You will be notified if your child is chosen for participation and your child will receive two books at the completion of the study as “thank you” for participating. All activities will take place during the regular school day and will not exceed a total of 60 minutes over several weeks. All information collected will be kept confidential. Thank you for your assistance. Please feel free to contact me at (419) 354-9011, ext. 109 with any questions.

Sincerely,

Andrea L. Glesser
University of Toledo, Doctoral Student
Appendix B

ELP-MAT Short Story: “Max Finds His House”
Max Finds His House.
Max, a brown dog, wanted his very own house. He decided to take a walk and look for his house.
He met three dogs, who he had met before.
The first dog's name was ______. The second dog’s name was ______. The third dog’s name was ______.
Kit, Spot, and Fang did not know about any houses.
Max walked and walked. “I wish I had a house,” he said.
Max saw a newspaper. Maybe this paper tells me how to find a house.
The newspaper had letters on it.
He tried to read the paper, but it did not help him find a house.
Max was worried and he felt **sad**.
He wanted a house and he wanted it **_____**.
Max really wanted to find a **house**.
So he decided to ask a **_____**.
Max walked so far he started to feel lost.
But then he recognized some papers and signs and he knew he was close to home.
After a long day, Max finally reached his own backyard. And to his great surprise, someone had built Max his very own house!
Appendix C

ELP-MAT Assessment Protocol
BOOK NAME: Max finds his house

CHILD'S NAME: 

CHILD'S AGE: 

DO/SAY: (PLACE THE BOOK UPSIDE DOWN ON THE TABLE IN FRONT OF THE CHILD). SAY: CAN YOU GET THE BOOK READY FOR US TO READ?

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POINT</td>
<td>0 POINT</td>
<td></td>
</tr>
</tbody>
</table>

SCORING: CHILD GETS ONE POINT IF ALIGNS BOOK CORRECTLY

SAY: PUT YOUR FINGER ON THE NAME OF THE BOOK. (CUE: CAN YOU PUT YOUR FINGER ON THE TITLE OF THE BOOK?)

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POINT</td>
<td>0 POINT</td>
<td></td>
</tr>
</tbody>
</table>

SCORING: CHILD GETS ONE POINT IF POINTS TO ONE OR MORE WORDS IN TITLE

READ: Max finds his House.

| SAY: WHERE DO I BEGIN TO READ? |
|-------------------------------|-----------------|-----------------|
| SCORING: TWO POINTS IF POINTS TO FIRST WORD, TOP LINE, ONE POINT IF POINTS TO ANYWHERE ON TEXT |

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 POINTS</td>
<td>1 POINT</td>
<td>0 POINT</td>
</tr>
</tbody>
</table>

SAY: WHICH WAY DO I READ?

| SAY: WHICH WAY DO I READ? |
|----------------------------|-----------------|-----------------|
| SCORING: TWO POINTS IF SWEEPS LEFT-TO-RIGHT, ONE POINT IF SWEEPS TOP-TO-BOTTOM |

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 POINTS</td>
<td>1 POINT</td>
<td>0 POINT</td>
</tr>
</tbody>
</table>

READ: Max, a brown dog, wanted his very own house. He decided to take a walk and look for his house.

| READ He met three dogs, who he had met before. |

| SAY: PUT YOUR FINGER ON JUST ONE LETTER ON THIS PAGE |
| SCORING: ONE POINT IF POINTS TO ONE LETTER |

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POINT</td>
<td>0 POINT</td>
<td></td>
</tr>
</tbody>
</table>

| SAY: PUT YOUR FINGER ON THE FIRST LETTER ON THIS PAGE |
| SCORING: ONE POINT IF POINTS TO FIRST LETTER |

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POINT</td>
<td>0 POINT</td>
<td></td>
</tr>
</tbody>
</table>

| SAY: PUT YOUR FINGER ON A CAPITAL LETTER ON THIS PAGE. (CAN ALSO SAY: DO YOU SEE AN UPPER CASE LETTER? PUT YOUR FINGER ON IT.) |
| SCORING: ONE POINT IF POINTS TO CAPITAL LETTER |

<table>
<thead>
<tr>
<th>FRONT</th>
<th>PA</th>
<th>ALPHABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POINT</td>
<td>0 POINT</td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>PRINT</td>
<td>PA</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>3 POINTS</td>
<td>2 POINTS</td>
</tr>
<tr>
<td>1</td>
<td>0 POINTS</td>
<td>0 POINTS</td>
</tr>
</tbody>
</table>

SAY: WHEN I READ THIS PAGE, SOMETIMES I AM GOING TO SAY A WORD IN A SPECIAL WAY. LISTEN AND TRY TO SOUND OUT THE WORD I AM SAYING.

**READ** The first dog’s name was **K-it**.

**SCORING:** THREE POINTS IF BLENDS WORD ACCURATELY ON FIRST TIME; TWO POINTS IF BLENDS WORD ACCURATELY AFTER SECOND PRESENTATION; ONE POINT IF ATTEMPTS TO PRODUCE SOUNDS AND BLEND THEM (EVEN IF THEY AREN’T AN ACCURATE REPRESENTATION OF THE SOUNDS PRODUCED)

**READ** The second dog’s name was **S-p-o-t**.

**SCORING:** THREE POINTS IF BLENDS WORD ACCURATELY ON FIRST TIME; TWO POINTS IF BLENDS WORD ACCURATELY AFTER SECOND PRESENTATION; ONE POINT IF ATTEMPTS TO PRODUCE SOUNDS AND BLEND THEM (EVEN IF THEY AREN’T AN ACCURATE REPRESENTATION OF THE SOUNDS PRODUCED)

**READ** The third dog’s name was **F-a-ng**.

**SCORING:** THREE POINTS IF BLENDS WORD ACCURATELY ON FIRST TIME; TWO POINTS IF BLENDS WORD ACCURATELY AFTER SECOND PRESENTATION; ONE POINT IF ATTEMPTS TO PRODUCE SOUNDS AND BLEND THEM (EVEN IF THEY AREN’T AN ACCURATE REPRESENTATION OF THE SOUNDS PRODUCED)

**READ** Kit, Spot, and Fang did not know about any houses.
| 5 | READ Max walked and walked. “I wish I had a house,” he said. |
|   | SAY: SHOW ME WHERE MAX IS TALKING |
|   | SCORING: TWO POINTS IF POINTS TO DIALOGUE BUBBLE, ONE POINT IF POINTS TO ANY TEXT |
| 6 | READ Max saw a newspaper. Maybe this paper tells me how to find a house |
|   | SAY: PUT YOUR FINGER ON A VERY SMALL WORD ON THIS PAGE |
|   | SCORING: ONE POINT POINTS TO A, ME, TO, HOW, SAW, MAX |
|   | SAY: PUT YOUR FINGER ON THE SPACE BETWEEN TWO WORDS |
|   | SCORING: ONE POINT POINTS TO SPACE BETWEEN TWO WORDS |
| 7 | READ The paper had letters on it. |
|   | SAY: LOOK MAX IS READING ALL THE LETTERS IN THE ALPHABET. NAME THE LETTERS WHILE I PUT MY FINGER ON EACH ONE |
|   | SCORING: ONE POINT FOR EACH LETTER (CIRCLE THE LETTERS THE CHILD NAMES CORRECTLY) |
|   | Q | C | L | V | K | E | W | A | Y | M |
|   | S | N | Z | D | O | F | T | B | J | I |
|   | X | U | P | C | H | R | OUT OF 26 LETTERS |
READ: He tried to read the paper, but it did not help him find a house.

SAY: Put your finger on just one word on this page.

SCORING: One point if points to one word

SAY: Put your finger on the first word on this page.

SCORING: One point if points to first word

SAY: Put your finger on the second word on this page.

SCORING: One point if points to second word

SAY: Put your finger on the last word on this page.

SCORING: One point if points to last word

---

SAY: There are four lines on this page (put your finger on each one, two, three, four during pointing): Which one do I read first?

SCORING: One point if points to top line

SAY: Which one do I read last?

SCORING: One point if points to bottom line

SAY: Now I am going to need your help on this page. I need you to help me make a rhyme. See if you can tell me the rhyming words that go with the story.

READ: Max was worried and he felt sad. He wanted a house and he wanted it (b)___

SCORING: Two points if child says a rhyming word on first attempt, (doesn’t have to be real word, just must rhyme), one point if child produces rhyming word on second attempt. Say the first sound of the target word.

READ: Max really wanted to find a house; so he decided to ask a (m)___

SCORING: Two points if child says a rhyming word on first attempt, (doesn’t have to be real word, just must rhyme), one point if child produces rhyming word on second attempt. Say the first sound of the target word.
READ: Max walked so far he started to feel lost.

SAY: MAX IS READING SOME SIGNS AND PAPERS; TELL ME WHAT MAX IS READING.

SCORING: TWO POINTS IF THE CHILD SAYS THE "REAL LOGO." ONE POINT IF CHILD SAYS THE CATEGORY (E.G. RESTAURANT FOR "ARBY'S." CEREAL FOR "FRUIT LOOPS." WRITE DOWN WHAT THE CHILD SAYS FOR EACH LOGO.

<table>
<thead>
<tr>
<th>LOGO</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TACO BELL</td>
<td>2 POINTS</td>
<td>1 POINT</td>
</tr>
<tr>
<td>SKITTLES</td>
<td>2 POINTS</td>
<td>0 POINTS</td>
</tr>
<tr>
<td>KRAFT</td>
<td>2 POINTS</td>
<td>1 POINT</td>
</tr>
<tr>
<td>LAYS</td>
<td>2 POINTS</td>
<td>1 POINT</td>
</tr>
</tbody>
</table>

READ: After a long day, Max finally reached his own backyard. And to his great surprise, someone had built Max his very own house!
SAY: NOW THAT WE ARE DONE, I WANT YOU TO WRITE YOUR NAME ON THE BACK TO SHOW ME WE READ THE BOOK TOGETHER  

<table>
<thead>
<tr>
<th>TOTAL POINTS</th>
<th>PRINT</th>
<th>PA</th>
<th>ALPHABET</th>
<th>NAME WRITING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OUT OF 27</td>
<td>OUT OF 13</td>
<td>OUT OF 26</td>
<td>OUT OF 7</td>
</tr>
</tbody>
</table>
Appendix D

Scoring Criteria for Name Writing Domain
Name Writing Scoring Criteria

<table>
<thead>
<tr>
<th>Points</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Name is a scribble with picture representing both picture and written name</td>
</tr>
<tr>
<td>1</td>
<td>Name is a scribble intertwined with a picture, child identifies picture or part of picture as written name</td>
</tr>
<tr>
<td>2</td>
<td>Name is an unrecognizable scribble</td>
</tr>
<tr>
<td>3</td>
<td>Name consists of random letters and symbols</td>
</tr>
<tr>
<td>4</td>
<td>Name consists of some correct letters and possibly some filler letters or symbols</td>
</tr>
<tr>
<td>5</td>
<td>Name consists of many correct letters with no filler letters or symbols</td>
</tr>
<tr>
<td>6</td>
<td>Name is generally correct, some letters may be written backwards or may be a complete mirror image</td>
</tr>
<tr>
<td>7</td>
<td>Name is correct with no backwards letters or mirror image writing</td>
</tr>
</tbody>
</table>

Adapted from Invernizzi, Sullivan, Meier, & Swank, 2004
Appendix E

Recruitment Flyer
Would you be interested in having your child participate in an Early Literacy Project?

- What is it?
  - A project to develop a child-friendly assessment
- What does the assessment focus on?
  - Prereading skills (e.g., letter names, rhyming)
- Where and when will it take place?
  - During the day at your child’s school
- How much time will it take for my child to participate?
  - Approximately 60 minutes spread out over several weeks*
- How can I learn more?
  - Read the permission slip sent with this flyer
  - Call or email Andrea Glessner at andrea.glessner@utoledo.edu or 419-354-9011, x 109 or Joan Kaderavek at 419-530-2505 or joan.kaderavek@utoledo.edu

*Please Note: Project will also include a brief file review to determine developmental levels, hearing status, etc.
Appendix F

Letter of Consent
Early Childhood, Physical, and Special Education  
Mail Stop 954  
Gilham Hall  
University of Toledo  
Toledo, OH 43606

CHILD RESEARCH SUBJECT - INFORMED CONSENT FORM  
Early Literacy Project

Principal Investigator: Joan N. Kaderavek, Professor, 419-530-2505

Student Investigator: Andrea L. Glesser, Doctoral Student, 419-354-9011, ext. 109

Purpose: Your child is invited to participate in an early literacy research project being conducted at the University of Toledo under the direction of Dr. Joan Kaderavek. The purpose of this study is to evaluate the effectiveness of a child-friendly early literacy assessment tool.

Description of Procedures: This project will take place in your child’s school over the fall/winter months. Your child will be given several assessments to evaluate early literacy skills. We will work closely with the school administration and your child’s preschool teacher to minimize any disruption to the school day. If you decide to allow your child to participate, we will randomly select a group of children to be assessed. If selected, your child will participate in one short assessment (approximately 10 minutes) and one longer assessment (approximately 30-45 minutes). During the assessments, your child will participate in several early literacy activities (e.g., pointing to pictures, naming letters, writing name). Following the assessments, your child will be given two high quality age-appropriate books to take home as a “thank you.” Your child’s results on the assessments will not be shared with his/her teacher or any other school personnel. Participation is completely voluntary; your decision regarding your child’s participation will not affect any educational programming or decisions for your child.

During or after your child’s participation we are happy to tell you more about the data, theory, and study, and answer any questions you may have.

Potential Risks: There are minimal risks (psychological, emotional, physical, or other) expected as a result of your child’s participation in the assessments. The assessments are designed for preschool children and are child-friendly activities, typical of early childhood settings. The assessments are administered by a highly qualified educator.

Potential Benefits: Your child will receive two storybooks as a “thank you present.”

Confidentiality: The researchers will make every effort to prevent anyone who is not on the research team from knowing any details about your child. The consent forms with signatures will be kept separate from responses and data will be coded to protect confidentiality. Although we will make every effort to protect your confidentiality, there is a low risk that this might be breached.
Voluntary Participation: If you decide that you do not want your child to participate in this study, there will be no penalty or loss of benefits to which you are otherwise entitled and will not affect your relationship with The University of Toledo or your child’s school. In addition, you may discontinue participation at any time without any penalty or loss of benefits.

Contact Information: Before you decide to accept this invitation to take part in this study, you may ask us any questions. If you have questions at any time before, during, or after your child’s participation you should contact Joan Kaderavek, Principle Investigator, at 419-530-2505 or by email at joan.kaderavek@utoledo.edu. If you have questions beyond those answered by the research team or your rights as a research subject or research-related injuries, please feel free to contact the Chairperson of the SBE Institutional Review Board, Dr. Barbara Chesney, in the Office of Research on the main campus at (419) 530-2844.

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. If you would like your child to participate, please sign this form and return to your child’s teacher.

SIGNATURE SECTION – Please read carefully

You are making a decision whether or not to participate in this study. Your signature indicates that you have read the information provided above, have had all your questions answered, and you have decided to allow your child take part in this research.

The date you sign this document to enroll in this study, that is, today’s date must fall between the dates indicated at the bottom of the page.

Name of Child (please print)                     Child’s Date of Birth

Parent’s Name (please print)                     Signature                     Date

THE UNIVERSITY OF TOLEDO
SOCIAL, BEHAVIORAL & EDUCATIONAL INSTITUTIONAL REVIEW BOARD

The research project described in this consent form and the form itself have been reviewed and approved by the University of Toledo Social, Behavioral & Educational Review Board (SBE IRB) for the period of time specified below.

SBE IRB #: ___________________  Approved Number of Subjects: ___________________

Project Start Date: ___________  Project Expiration Date: ___________________

____________________________  __________________________
Barbara Chesney, Ph.D., Chair     Date: ____________________
UT Social Behavioral & Educational IRB
Appendix G

Parent Letter
Dear Parents,

Thank you for allowing your child to participate in the early literacy research study being conducted by the University of Toledo, Department of Early Childhood, Physical, and Special Education. Your child will be participating in several emergent literacy activities over the next several weeks involving storybook reading and other related tasks. In order to complete the data collection process, I am requesting that you fill out the following questionnaire and return it to school with your child. All information will be kept confidential. Thank you for your assistance.

Sincerely,

Andrea L. Glesser
University of Toledo, Doctoral Student
Appendix H

Student Information Sheet
STUDENT INFORMATION:

Child’s Name: ____________________________ Parents Names: ________________

Gender: □ Male □ Female Date of Birth (child): ________________

Address: _______________________________ City/State/Zip: ________________

Phone: _______________________________ Email: _______________________

Ethnicity/Race: □ White □ Hispanic □ Black □ Am Indian □ Asian □ Multi-Racial □ Other

Child’s Native Language (if not English): ____________________________________

Parent’s Native Language (if different than child): ____________________________

Languages other than English spoken in the home: ____________________________

Mother’s Educational Level: □ Did not graduate high school
□ High school □ Some college □ College graduate □ Graduate school

Father’s Educational Level: □ Did not graduate high school
□ High school □ Some college □ College graduate □ Graduate school

Mother’s Occupation: ____________________________

Father’s Occupation: ____________________________

Siblings living with the child:

Name Age Relationship (i.e. brother/sister)

__________________________________ _______ _______________________

__________________________________ _______ _______________________

__________________________________ _______ _______________________

__________________________________ _______ _______________________

__________________________________ _______ _______________________

Does your child have a history of speech/language, hearing, or developmental delays?

□ Yes □ No

If Yes, please describe: ____________________________________________________