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KINDERGARTEN LITERACY SCREENING: CULTIVATING A MULITFACTORIAL PREVENTIVE APPROACH TO LITERACY INSTRUCTION

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KINDERGARTEN LITERACY SCREENING: CULTIVATING A MULITFACTORIAL PREVENTIVE APPROACH TO LITERACY INSTRUCTION

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ABSTRACT

KINDERGARTEN LITERACY SCREENING: CULTIVATING A MULITFACTORIAL PREVENTIVE APPROACH TO LITERACY INSTRUCTION

Susan Schatz

Universal screeners are mandated in many states, but the impact of the use of screeners and pragmatic instructional programs are not well connected. The purpose of this mixed methods study addressed a significant need for understanding how to connect screening instruments to instructional designs that support a preventative approach to literacy instruction. Additionally, this study aimed to uncover teachers' perceptions about the affordances and challenges of screeners to create a multitiered system of supports for reading instruction in an inclusive kindergarten setting. Encompassing a pragmatic research paradigm this study was framed by cognitive behavioral theory revealing a multiple cognitive deficit model of dyslexia. This study utilized a mixed methods explanatory sequential design. The participants included one class of kindergarten students and one kindergarten teacher in a west coast suburban parochial school. Data collection included scores on the PALS literacy screener and KTEA-3 dyslexia screener and a semi-structured teacher interview. A Pearson r correlation coefficient was used to analyze the quantitative data. A significant correlation was noted between constructs within and between the PALS and KTEA-3 screeners. Letter naming facility, letter sound understanding and concept of word all presented as important constructs. A generic coding method was used to analyze the qualitative data and then the quantitative and

qualitative data were integrated. Results from this research offer the potential to guide future research in practical models for inclusive literacy instruction aligned to multi-tiered system of supports within the kindergarten classroom setting.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

Background

Foundational literacy skills are the gateway to developing critical literacy skills needed to actively engage with texts. The ability to read, write, and communicate provides a person the tools they need to grow in knowledge and transfer that knowledge in new and creative ways. Literacy is a civil right unknown to many. Upwards of 63% of fourth grade students in the United States are reading below grade level (*NAEP Mathematics and Reading Highlights*, n.d.). Many of those students have been identified as having dyslexia (Sanfilippo et al., 2019). Affecting 5-17% of children, dyslexia is a common learning disability often diagnosed after being unable to learn to read in elementary school (Ozernov-Palchik et al., 2016; Sanfilippo et al., 2019). Characteristics of dyslexia include a struggle with decoding, speed, and accuracy of single word reading (Zuk et al., 2019). Genetic, environmental, cognitive, and neurobiological components are involved in predisposing a child to developing dyslexia (Ozernov-Palchik et al., 2016). Foundational skills must be developed before a person can engage in the critical literacies necessary in the world today. Kindergarten literacy screenings support movement away from a wait to fail approach toward a preventative approach (Gaab, 2019), but there is much more work to be done.

Even though there is no support for a discrepancy model in education, (Sanfilippo et al., 2019) such criteria is what is traditionally used to identify students in need of educational supports. A misconception between the components and purpose of early literacy screening measures contributes to the resistance against implementing such measures (Gaab, 2019). The purpose of early literacy screening is not to diagnose

students, but to create a risk profile and implement effective literacy supports within the classroom setting (Torgesen, 2004a). Changing from a deficit-driven discrepancy model to a preventative 'support' model is needed to change the trajectory of reading achievement (Gaab, 2019).

Effective literacy screeners include assessment of pre-literacy skills predictive of long-term reading outcomes including phonological awareness, letter-sound knowledge, rapid automatized naming skills, vocabulary, and oral language comprehension skills (Gaab, 2019; Ozernov-Palchik et al., 2017). Learning letters and their sounds is a critical component of early reading acquisition. Alphabetic knowledge (the knowledge of letter names, letter sound patterns, letter forms) and phonological awareness are two of greatest and most consistent predictors of early literacy success (Torgesen, 2004). Using the alphabetic principle fluently combines phonological recoding and letter sound correspondence to read and pronounce words accurately (Baker et al., 2018). Proactively identifying such early literacy skills predictive of later literacy success is crucial in supporting students who may be susceptible to negative long-term achievement effects (Reutzel, 2015). Even so, many teachers struggle with knowing how to properly assesses students and then provide differentiative instruction in foundational literacy skills to support mastery for all students (Jones et al., 2015).

Statement of the Problem

Recent policies including the 2015 Every Student Succeeds Act (ESSA) and frameworks for a multi-tiered system of supports (MTSS) focus on a multifaceted scalable and sustainable approach to education (CA Dept of Education, 2019). Due to the importance of emergent reading skills, the need for universal screenings is well

documented (Ferrer et al., 2015). Yet surprisingly, a direct positive relationship between screening assessments and improved reading outcomes does not always exist (Breaux et al., 2017).

Comprehensive reading instruction incorporates alphabetics, phonological & phonemic awareness, fluency, vocabulary, and comprehension (Foorman & Torgesen, 2001). Given alphabetics and phonemic awareness have positive predictive power of later literacy achievement (Ehri et al., 2001; Piasta et al., 2012), this study addresses a significant need for understanding instructional designs that support the acquisition of foundational literacy skills of phonemic awareness, letter sound knowledge, and decoding by spring of kindergarten. Intervention at later grades may decrease or prevent an achievement gap from widening, but will not overcome the already existing differences in early grades (Ehri & McCormick, 1998; Piasta et al., 2012).

Mixed methods research is uniquely positioned to offer a pragmatic approach to providing such insights for accountability-based instructional reforms (Good, 2014). With this greater understanding educators have the potential to implement sustainable and impactful models of alphabetics instruction and significantly reduce disparities in reading achievement. Establishing a connection (Lyon & Weiser, 2009) between differentiated instruction based on universal screeners and tools to positively impact foundational reading skills in kindergarten students along with teacher feedback regarding the feasibility of implementation fills a void in a timely area of research (Piasta, 2016).

Summary of the Purpose of the Study

The purpose of this mixed methods explanatory sequential study was to examine the relationship between constructs on the screeners, and the teacher's perception of using the KTEA-3 and PALS screeners to create a multitiered system of supports for reading instruction. Additionally, this study addressed the convergence of the data influences on the practical implementation of reading screeners in kindergarten.

Theoretical Rationale

This study was framed by cognitive behavioral research revealing a multiple cognitive deficit model of dyslexia. For many years, single or dual route models of dyslexia prevailed. Dual coding theory is a theory of cognition in which mental representations of verbal and nonverbal experiences are processed in separate mental systems (Sadoski & Paivio, 2013). Dual coding theory and single cognitive deficit models emphasize a phonologic core deficit or a double deficit accounting for a deficit with both phonological awareness and naming speed linked to the nonverbal coding system (Pennington, 2006).

In 2006, Pennington introduced a probabilistic multifactorial model for dyslexia. The multiple deficit model proposed more recently by Pennington evolved from gaps in previous models when addressing comorbidities between dyslexia, attention, deficit hyperactivity disorder, and speech sound disorder (Pennington, 2006). Follow-up research addressed the clinical utility of single versus multiple cognitive deficit models of dyslexia and researchers found multiple predictors made additive contributions to predicting dyslexia (Pennington et al., 2012). Cognitive neuroscientific findings of Ozernov-Palchik, et al (Ozernov-Palchik et al., 2016) further elucidated the multiple risks

and protective factors interacting at the genetic, neurobiological, cognitive, and environmental levels and describe the muticomponential model for dyslexia as an extension of previous models.

Positioned in a prenatal to postnatal timeline, Ozernov-Palchik (Ozernov-Palchik et al., 2016) illustrated the interaction between the multiple risk and protective factors related to developing dyslexia. Such interactions are described throughout this paragraph. At the genetic level, dyslexia has an average heritability of 60%. Specifically, "studies in adults and children have shown that polymorphisms in dyslexia susceptibility genes are associated with structural temporoparietal gray and white matter alterations during development" (Ozernov-Palchik et al., p. 3, 2016). At the brain level, risks develop prenatally with atypical neuronal migration or synaptic cell development and extend to atypical development in the structure and functional connectivity of the reading circuitry postnatally. Sensory and cognitive systems are typically coordinated in the left-hemisphere, yet right hemisphere involvement has been shown to act as a compensatory neural mechanism (Zuk et al., 2019). At the cognitive level, atypical development at the sensorimotor, language, and attention functions before birth can develop into atypical skills related to reading development such as phonological awareness, working memory, rapid naming, letter knowledge, vocabulary, and executive functions. However, high intelligence and rich vocabulary along with other areas of cognition can serve as protective factors against dyslexia (Ozernov-Palchik et al., 2016). Lastly, environmental factors, especially those related to socioeconomic status (SES) are strongly correlated with dyslexia (Zuk et al., 2019). Low home literacy, parent educational background, and SES connected with ineffective schooling and resources are risk factors for dyslexia.

Fortunately, through a multiple deficit model of dyslexia, researchers can also focus on protective environmental variables such as optimizing a home literacy environment and increasing teacher efficiency through shared reading and rich child-directed speech.

Overall, the multi-deficit view of dyslexia through a critical literacy paradigm brings voice to the teacher while providing the individualized intervention needed for each student in order to optimize reading outcomes (Ozernov-Palchik et al., 2017).

Research Questions

This study will be guided by the following research questions:

1. What is the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener?
2. What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multi-tiered system of supports for reading instruction in an inclusive kindergarten setting?
3. How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

Definition of Terms

Alphabetic Principle. Connecting letters and their sounds to read and write. The alphabetic principle contains two components: the alphabetic understanding and phonologic recording. Alphabetic understanding is simply the awareness that words are made up of letters representing the sounds of speech. Phonologic recoding involves the ability to translated printed text into the sounds they make; a necessary skills to read (Baker et al., 2018).

Assessment Capable Learners. Student's accountable for their progress by knowing where they are, where they are going, and next steps. Assessment capable learners recognize when they are ready for the what is next and understand how to select from a range of strategies to promote their learning (Frey et al., 2018)

Collective Efficacy. An attitude that together teachers in school can make a difference in student learning (Donohoo, 2017). Collective efficacy is developed as individual colleagues develop their own self-efficacy and then come together as a group toward a common goal.

Concept of Word. A child's awareness that spoken words match to their written counterparts (Flanigan, 2007). This voice to print matching is seen as a linchpin in connecting more primitive to more advanced levels of phonological awareness.

Dyslexia. Neurodevelopmental disorder characterized by a deficit in the accurate or fluent decoding of single printed words. Dyslexia cannot be explained by poor hearing or vision, low language enrichment, or lack of motivation or opportunity (Pennington et al., 2012; Sanfilippo et al., 2019).

Enhanced Alphabetics Routine. Enhanced alphabetic instruction is based on the five evidence-based advantages influencing letter and sound acquisition: (1) Student's Own Name, (2) Alphabet Order, (3) Letter Frequency, (4) Letter Name Pronunciation, (5) Consonant Phoneme Acquisition Order (Jones & Reutzel, 2012).

Inclusive Practices. Providing multiple tiers of instructional support within the classroom setting. Inclusive practices support the development of the teacher as a professional who differentiates instruction for all students in a heterogenous classroom setting.

Multi-Tiered System of Supports (MTSS). Multi-tiered comprehensive framework focused on aligning the entire system of initiatives, supports, and resources. Includes intentional design and redesign of integrated services and supports including English language learners, gifted, and special education students (*Definition of MTSS - Multi-Tiered System of Supports (CA Dept of Education)*, 2019).

Phonemic Awareness. Phonemic awareness is connected to the facility with which a student manipulates the smallest units of language, individual phonemes (Ehri et al., 2001).

Phonological Awareness (PA). PA is a pre-literacy skill that includes identifying and manipulating units of oral language including words, syllables, and sounds. Poor phonological awareness is one of the most reliable markers of dyslexia prior to reading onset (Zuk et al., 2019).

Rapid Automatized Naming (RAN). RAN represents the ability to rapidly retrieve the name of visually presented items (Ozernov-Palchik et al., 2016) presented as pictures of commonly known items or letters in a series of rows on a page.

Response to Intervention (RTI). A tiered system of supports designed to expertly match the level of intervention with student need (Howard, 2009). Levels of support are often identified over three tiers with each tier increasing in time and frequency of support.

Universal Screening. A quick assessment of early literacy skills predictive of later literacy success most commonly administered to students in kindergarten and first grades. Universal screenings can be general academic screenings or be more specifically constructed as measures assessing a student's risk of dyslexia. Universal screeners are a

snapshot in a student's progress and are not comprehensive assessments that identify dyslexia or other learning differences.

Significance of the Study

When considering how to translate theoretical perspectives it is important to focus on high yield instructional strategies and routines that best influence student learning. Planning must be focused on impact, not instruction (Howard, 2009). An effective literacy model focuses on both the core areas of literacy acquisition as well as teacher clarity as it pertains to organization, explanation, examples, guided practice, and assessment of student learning (Fisher et al., 2019). Universal screeners are mandated in many states, but the impact of the use of screeners and pragmatic instructional programs are not well connected. Results from this research will guide future research in developing practical models for prevention and early intervention aligned to an MTSS model within the kindergarten classroom setting. Such a model will expound the professional capacity of the classroom teacher in their ability to differentiate instruction through multiple tiers of support in an interactive heterogenous setting.

CHAPTER 2: REVIEW OF RELATED RESEARCH

Historical accounts of reading achievement in the United States consistently document an academic achievement gap throughout subsets of the population (Gilmour et al., 2019). Recently, policies have been refined in an effort to prevent an achievement gap in reading (Sharp, 2016). Reading screeners emerged as a theme in the research around preventing reading difficulties as early as kindergarten (Piasta et al., 2012; Reutzel, 2015). The intent of reading screeners is to increase treatment utility by connecting multiple tiers of intervention to students identified as needing academic support. However, there is a gap in the literature addressing practical models of preventative reading instruction in alphabetics aligned to an MTSS framework that fosters the reduction of an achievement gap by the end of kindergarten.

The Persistent Achievement Gap

Subgroups

An achievement gap between high performing and low performing students exists and continues to widen. The current model for reading instruction and intervention does not work well enough to reverse the trend. As exemplified in the National Assessment of Educational Progress (NAEP) report, between 2002-2011 fourth grade reading scores for students without disabilities increased from 220 to 225, whereas students with disabilities declined from 188-186 (Vaughn & Wanzeb, 2014). When comparing the most recent 2017 results to 2015, the national average of students at or above proficient remained stagnant at 35%. Continually, the scores of students in the 25th and 10th percentiles decreased in fourth grade and remained constant for students in grade 8 (*NAEP Mathematics and Reading Highlights*, n.d.). With 65% of fourth graders reading below

proficient levels, (*NAEP Report Cards - Home*, n.d.) the achievement gap is an area of concern for all students, especially those in the special education, English language learner and low socioeconomic populations.

Addressing the persistent achievement gap, Gilmour et al. (2019) conducted a meta-analysis of the reading achievement gap between students with and without disabilities. The meta-analysis included publications in English from 1997-2016. Study samples were coded according to (a) years in which the data were collected, (b) disability type, (c) age and grade level, (d) school, district, state, or national level of data collection, (e) the means by which student disability was determined, and (f) characteristics of students excluded from analyses (Gilmour et al., 2019). Using a random effects meta-analysis, a quantitative analysis revealed an achievement gap between students with and without disabilities of 1.17 standard deviations, equivalent to 2.2 years of reading growth (Gilmour et al., 2019). Gilmour et al. described the achievement gap for students with disabilities as alarming and called for not only evidenced based practices, but also research on the necessary structures and supports for creating sustainable implementation of evidenced based delivery models (Gilmour et al., 2019).

English language learners (ELL) are another subgroup of students vulnerable to the reading achievement gap. According to a report for the Economic Policy Institute (Carnoy & García, 2017) while still large, achievement gaps between black-white and Hispanic-white students are narrowing and Asian students excel in reading achievement. Contrarily, English language learners of Hispanic and Asian decent experienced a widening achievement gap. Additionally, Non-ELL Hispanics are narrowing the achievement gap with whites (Carnoy & García, 2017). Differential access to language

services can create inequities for ELL students to reach achievement levels equitable with their native English speaking peers (Reid & Heck, 2018).

Achievement differences among ELL groups are confounded with socioeconomic status (Goldenberg, 2011). As articulated in the 2017 report by Garcia and Weiss for the Economic Policy Institute, the achievement gap between high and low socioeconomic grew in prevalence between 1998 and 2010 with the low SES students entering kindergarten in 2010 being more likely to be poor readers. Investments in Pre-kindergarten programs had varying effects on reading achievement due to variability in access to programming across states. Interestingly, personal investments that persons with low-SES made in their children in the form of books in the home, engagement in more enriching activities, and higher academic achievement present as greater factors in school readiness (García & Weiss, 2017).

As 80% of fourth grade students from low socioeconomic backgrounds read below grade level, the risk of developing dyslexia is strongly associated with reading achievement (Sanfilippo et al., 2019). Zuk et al. (2019) found at-risk kindergarteners of low SES to be more likely to later develop dyslexia than those with higher SES. Though many children do not meet the specific diagnosis of dyslexia, "children who struggle with reading have been shown to suffer the same adverse health and psychosocial consequences and benefit from interventions that have been primarily developed to address deficits associated with dyslexia" (Sanfilippo et al., p. 5, 2019). Additionally, researchers have found a strong connection between environmental factors, such as SES, with severity and subtypes of dyslexia. Utilizing a latent profile analysis technique and longitudinal regression approaches, with 1,215 kindergarten students across 20 schools

Ozernov-Palchik et al. (2017) found distinct subtype deficits that varied in severity. “Six distinct profiles of reading emerged and were characterized as follows: average performers, high performers, low-average performers, RAN risk, PA risk, and double deficit risk” (Ozernov-Palchik et al., 2017). In general, students in the rapid automatized naming (RAN) group had the highest scores, those in the phonological awareness (PA) group had lower scores, and those in the double deficit group had the lowest scores of all. Additionally, students were divided into low, medium, and high SES groups. There was a significant difference in the profile distribution across the SES groups; the majority of the PA and RAN deficit students belonged to the low SES groups. The double deficit group was proportional to the SES group size. Even more, the results showed complete stability of risk classifications from the beginning of kindergarten to the end of first grade. Overall, research results from Ozernov-Palchik et al. (2017) highlight the influence of social factors in reading achievement and point to the need to provide early literacy instruction aligned to each child’s learning profile.

Achievement and gaps across subgroups have proven to persist but windows of hope have emerged. Ozernov-Palchik et al. (2017) have identified the stochastic independence among letter knowledge, phonological awareness, verbal short-term memory, and rapid automatized naming as robust early predictors of profiles of reading development. Attention to progress through formative feedback (Sanfilippo et al., 2019) and timely personalized instruction routines offer opportunities to mitigate or even prevent an achievement gap in reading.

From Early Intervention to Prevention

It is widely accepted that causes of delayed reading proficiency vary from child to child (Ortlieb & Cheek, 2013). If interventions are delayed beyond first grade, they may decrease or prevent a gap in reading skills from widening but will not overcome the already existing differences. Data from the Connecticut Longitudinal Study, sample survey of Connecticut children entering public kindergarten reflective of the racial and ethnic composition of the nation at the time, revealed data supporting prior reports of the general lack of substantial improvement in reading achievement if interventions are withheld until after first grade (Ferrer et al., 2015). Additionally, Duncan & Seymour (2000) found alphabet knowledge to be a significant predictor of reading achievement for children with multilingual backgrounds and those genetically at risk for dyslexia. Still more, "delayed literacy acquisition in students from low socioeconomic backgrounds is traceable to a delay in acquiring alphabet knowledge" (Jones & Reutzel, 2012, p. 449). As such, universal reading and dyslexia screeners are now mandated across many states as districts shift their focus toward preventing reading failures rather than just remediating existing reading difficulties.

In "'Literacy Lift-Off': an experimental evaluation of a reading recovery program on literacy skills and reading self-concept", Higgins et al. (2015) applied the precepts of a developmental preventative approach to classroom-based interventions. The authors conducted an experiment on the effectiveness of Literacy Lift-Off, a whole class modified version of reading recovery, focused on letter identification, word attack skills, word reading, and reading self-concept beliefs. Prior to intervention, a chi-square analysis was conducted to ensure no significant differences in groupings for age and gender. Pre-

and posttest measures of the Woodcock Johnson Reading Mastery and Reading Self-Concept Scale scores of ninety-two students five to six years of age in mid-west Ireland were analyzed using a 2 x 2 mixed ANOVA. The within-subjects factor was time (pre-intervention and post-intervention) and the between-subjects factor was group (control versus experimental) (Higgins et al., 2015). Significant effects for the intervention group were noted in the areas of word attack, word identification, and self-concept. Results of this study place emphasis on utilizing research based practices for early interventions and promote such interventions containing structured activities that support student learning through scaffolding, modeling, and guidance (Higgins et al., 2015).

Feasibility

Providing early prevention and intervention research-based reading instruction to students, especially those with learning disabilities requires teachers equipped with the skills to deliver such instruction. Historical reading research reveals a large amount of reading instruction regardless of the setting, was spent doing low level tasks such as worksheets and seatwork (Swanson, 2008). Science supports the explicit instruction of the alphabetic principle (visual symbols called letters represent speech sounds known as phonemes). However, providing instruction in the most effective and efficient way is often not common practice (Duke & Mesmer, 2018). A cavity between effective instruction and common practices compounds the achievement gap and creates a critical call for further research in understanding how to develop expert teachers capable of delivering dynamic inclusive reading instruction.

Policies to Prevent an Achievement Gap

ESEA to ESSA

From national law to local district policies, efforts to remediate the achievement gap have been in the works since the 1950s. Following Brown versus Board of Education in 1954, President Johnson signed the Elementary and Secondary Education Act (ESEA) into law in 1965 (Duke & Mesmer, 2018). Increasing the federal government's role in education, ESEA sought to mediate the effects of poverty and racial inequality and provide equitable educational opportunities to all children (Thomas & Brady, 2005). Soon after, the 1966 Coleman Report established an achievement gap between white students and minority students as well as students with varying socioeconomic status. However, the Coleman Report challenged the tenets of ESEA and limited the school's role in influencing and addressing inequalities (Downey & Condron, 2016). A major component of ESEA, Title I intended to provide federal funds to support local education agencies serving high populations of students from low-income families. (Thomas & Brady, 2005). Though the intent was to serve educationally disadvantaged students, Title I services were often provided in pull-out programs tangential to the core curriculum (McDonnell, 2005). In the 80s, education policy reauthorized ESEA to focus on excellence and achievement, climaxing in the reauthorization of ESEA into the assessment driven act known as No Child Left Behind ("Title I: A Historical Snapshot of Key Federal Policy Changes," 2016). Near the same time, the Individuals With Disabilities Education Act was reauthorized, establishing an even greater emphasis on achievement and accountability (*Federal Monitoring and Enforcement of IDEA Compliance,* 2018). Most recently in 2015, the Every Students Succeeds Act (ESSA)

became the current national education law and increased empowerment for local education agencies to use evidenced-based interventions to foster school improvement (Sharp, 2016).

Every Student Succeeds Act (ESSA)

Federally funded, ESSA shifts accountability to local education agencies and requires that all students be taught to academic standards that will provide college and career readiness (*New York State's Final Every Student Succeeds Act (ESSA) Plan Summary*, 2018). State responsibilities include submitting accountability plans to the Education Department. While states can select their own goals, they must address the expectation that all groups including English language learners, students in special education, and those coming from homes with low socioeconomic status close gaps in achievement and graduation rates ("The Every Student Succeeds Act," 2015). New with ESSA is encouragement of evidence and place-based interventions by local educators ("Every Student Succeeds Act," 2017). With funding and flexibility, ESSA paves the way for educators to establish effectiveness with multi-tiered systems of support.

Multi-Tiered Systems of Support (MTSS)

Connecting supports in place through response to intervention and positive behavior supports, an MTSS framework moves the conversation from intervention toward prevention (*Multi-Tiered System of Supports (MTSS) | CDE*, 2019). MTSS is defined in the Every Student Succeeds Act as, "a comprehensive continuum of evidence-based, systemic practices to support a rapid response to students' needs, with regular observation to facilitate data-based instructional decision making" (Mandlawitz, 2016, p. 6). Similar to RTI in many ways, MTSS touts some unique and promising educational

practices. Of particular importance for supporting literacy is an increased integration of classroom instruction, and emphasis on universal design for learning, and intervention through aligning the entire system of initiatives, supports, and resources (*Definition of MTSS - Multi-Tiered System of Supports (CA Dept of Education)*, 2019). Instead of waiting for students to experience gaps in academic achievement, MTSS supports educators in rapidly responding to students' needs through multiple measures to support students at-risk for poor learning outcomes.

The Call for Screeners

Universal screening serves as a critical first step in a layered continuum of supports. Universal reading and dyslexia screeners are now mandated across many states as districts shift their focus towards preventing reading failures rather than just remediating existing reading difficulties. The beginning must start with the end in mind. With an end goal of transfer, early reading screeners must include the tools that will yield the desired results. Skill-specific assessment that probes a child's mastery of prerequisite and taught skills critical to developing foundational literacy skills can be used to differentiate interventions for individual students (VanDerHeyden & Burns, 2017). Given the ultimate goal of teaching for transfer, researchers seek to understand how to utilize a screener that addresses all of the subcomponents of dyslexia yet allows for instruction for all students needing reading support.

Dyslexia in the Context of Screeners. Understanding the place of dyslexia in the context of universal screeners and early intervention helps educators respond rapidly to students' needs. Research in the field of dyslexia is broad. Dyslexia is the most comprehensively studied of the learning disabilities, affecting 80% of all children

identified as learning-disabled. In fact developmental dyslexia is the most common neurobehavioral disorder in children, affecting 17-21% of the school-age population (Ferrer et al., 2015). As early as 1904 the physician Dr. James Hinshelwood "recognized the urgent need for early identification of children with congenital word blindness" (Shaywitz, 2003). Specifically, Hinshelwood urged schools to screen populations of children for signs of congenital word blindness and to provide appropriate teaching to children identified with the disorder (Shaywitz, 2003). Laws around dyslexia have been in the books for some time. For instance, in 1990 AB 3040 called for California to develop guidelines for specific learning disability – specifically dyslexia (Guerin et al., 1993). Current laws clarify the importance of the issue and bring dyslexia screening to the forefront of national and educational matters. In September 2016, the Senate passed resolution 576. Resolution 576 calls on "Congress, schools and state and local educational agencies to recognize the significant educational implications of dyslexia that must be addressed" (B. Shaywitz & S. Shaywitz, 2017, p. 1). In California, AB1369 "Requires updates to the criteria for identifying children with dyslexia for special education services by adding "phonological processing" to the identification process for special education eligibility" (Youman & Mather, 2015). Further, the severity and critical importance of the issue of early identification of dyslexia is crystalized by the prison population in the United States. "No other single mental or physical disorder is found to this great extent in our prison populations. While those in prisons were identified to be around 80% in 2008, the newest research published in July 2015 indicates this has moved upward to around 85%" (*Congressional Documents and Publications*, 2015). On the governmental level, Dr. Sally Shaywitz testified before the U.S. Senates' Health,

Education, Labor and Pensions Committee and explained dyslexia as having both an explanation and solution to the education crisis (Shaywitz & Shaywitz, 2017). Shaywitz implored, “We must act to curb this horrific epidemic by aligning education with scientific principles. Schools must screen for and identify dyslexic students early, provide evidence-based interventions, and importantly, ensure that dyslexic students know their diagnosis and understand that they are smart (Shaywitz & Shaywitz, 2017).

Aligned with the urging of Shaywitz, National and state level laws are beginning to translate into department of education guidelines. Oregon’s department of education now calls for a dyslexia specialist to help schools develop a plan to ensure that every kindergarten and first grade student enrolled in a public school in the state receive a screening for risk factors of dyslexia (Oregon Dyslexia Advisory Council, 2016). Even though California and numerous other states implemented laws for universal screening in kindergarten through second grades, little guidance in the practical application of administering screeners and then matching them to impactful instruction is offered (Council, n.d.). A major impediment in implementation of legislation regarding dyslexia revolves around the screening and assessment measures used to identify the skills and students in need of intervention (Guerin et al., 1993). Evidence from the Connecticut Longitudinal Study conducted by Shaywitz et al. (1990), revealed a referral bias against boys and students with behavior and activity problems, and cautioned against relying exclusively on schools referrals for identification of reading-disabled children (*Congressional Documents and Publications,* 2015). As exemplified by the department of education mandates and state guidelines, diverse interpretation of screening for dyslexia and related reading difficulties exist.

Research connecting realms of cognitive neuroscience, medicine, and education offer a window into the great potential of aligning assessments and prevention measures with findings from neuroscientific studies. In accordance with a multifactorial probabilistic model of dyslexia (Pennington, 2006), educational practices are increasingly addressing the role of protective factors when screening for and remediating dyslexia. Specifically, cognitive-linguistic factors associated with developing language skills and vocabulary through facilitating phonological development and rich contextual information have been shown to serve as a protective factor against at-risk children developing dyslexia (Yu et al., 2018). Environmental factors also offer shielding supports. Enriching home reading environments through shared dialogic reading has demonstrated potential compensatory effects (Ozernov-Palchik et al., 2016). Empirical research regarding increasing right hemispheric brain regions through the above mentioned compensatory factors is still limited, but offers an insight to the screener and related instructional strategies beneficial to students at-risk for dyslexia (Yu et al., 2018).

***Efficacy of a Sampling of Dyslexia Screeners*.** For over two decades, screening tests for dyslexia have been normed and designed to be administered by teachers to children four years and older. However, a significant variance between the administration and audience for the screeners is troubling. A closer look at The Dyslexia Screener, The Shaywitz Dyslexia Screener, and Nessy's Dyslexia Quest revealed correlational research around the efficacy of the screeners as well as the context for administering the screeners. Developed in the late 1980s, The Dyslexia Screener (TDS) is one of the quickest of all, requiring less than five minutes to administer (Guerin et al., 1993). A prediction-performance comparison analyses was used to test the efficiency of the TDS. The

positive and negative predictive values varied between boys and girls, being more accurate for boys (Guerin et al., 1993). TDS was designed for use in grades 2-9, not meeting the needs of early identification.

Another option, the Shaywitz dyslexia screener is normed starting in kindergarten. In the format of a teacher questionnaire, it is completed via an online student subscription. “The estimates of sensitivity and specificity reported by the publisher for the Shaywitz scale were .73 and .71 respectively for kindergarten and .70 and .88 respectively for first grade” (VanDerHeyden & Burns, 2017, p. 26). In a sample of one hundred students, such a level of specificity suggests the distinct possibility of multiple false positives (students without dyslexia being identified as such) and a smaller few of false negatives (students with dyslexia being missed).

A third screening consideration is Nessy’s Dyslexia Quest, a digital game-based dyslexia screening application available for parent purchase. Different from a rating scale, the Dyslexia Quest app was designed to measure cognitive aspects of learning linked to literacy (Carbol, 2014). Designed for ages five and older, areas of assessment include the following subcategories: working memory, phonological awareness, processing speed, visual sequential memory, auditory sequential memory, and visual memory. As Carbol (2014) describes in a research brief, Trials of the Dyslexia Quest app were conducted in 2011 at Belgravia School and Belgravia Dyslexia Centre, United Kingdom. A trained psychologist administered the Wechsler Intelligence Scale for Children (WISC IV) to 40 students ages 7 to 15. “A multiple regression analysis was undertaken to determine whether there was a strong enough relationship between student performance on the DQ and performance on either the WISC or the CTOPP

(Comprehensive Test of Phonological Processing) for the three variables considered (Carbol, 2014, p. 5). Carbol described the trial as yielding reasonably strong correlations: DQ and CTOPP phonological awareness subtest (.79) and the DQ and the WISC processing speed subtest (.73), as well as lower correlations between the DQ and the WISC working memory (.44). Designed as a low-cost learning app that could be used as a non-professional as a screening tool, Dyslexia Quest opens itself to significant error. Overall, the Shaywitz Dyslexia screener serves as the one viable option in the above-mentioned screeners. However, with the use of just the Shaywitz Dyslexia Screener a void in teachers matching screening tools to instruction still exists.

***Benefits, Risks, and Controversy*.** As previously stated, a major obstruction in translating legislation into practice are the tools educators and parents have at their disposal to screen for the skills placing students at-risk for reading difficulties and dyslexia. Guerin et al. (1993), argue for an easily administered, cost-effective, and valid screening instrument for reading disabilities. While potentially helpful in identifying students at risk for dyslexia, well-intentioned screening actions may result in unintended negative consequences (VanDerHeyden & Burns, 2017). Even amongst dyslexia screeners, a clearer determination of what areas of measurement need to be included on effective dyslexia screeners, student directed tests versus teacher and parent questionnaires, and the level of training necessary to provide valid results is crucial to the usefulness of the screeners. Even more, though dyslexia screeners are helpful in identifying a large percent of students with dyslexia, the effectiveness of their use is still debated. As VanDerHeyden and Burns (2017) argue, “Most dyslexia screeners do not provide instructionally relevant data, which results in an expenditure of considerable

resources with little opportunity to improve student outcomes" (p. 26). Screening alone does not improve outcomes. In educational screenings, errors of referral are preferable to under referrals, so children in need of services are less likely to be missed (Guerin et al., 1993). Thus, it is imperative to consider the types of screeners connected to reliable referrals for personalized instruction without prematurely labeling a child with dyslexia.

Universal Screening. Universal screeners measuring subskills correlated with dyslexia but focusing on identifying the needed level of intervention versus the risk of dyslexia, serve as another viable option in the screening process. Understanding the components yielding a high-level universal screener shed light on the usefulness of available options. According to Dykstra, predictive validity, classification accuracy, and normative scoring are major features that distinguish a superior reading screener (Dykstra, 2013). Predictive validity (how strong the predictions are of future performance), classification accuracy (how accurately the screener identifies those students at risk and not at risk), and high correlations of broad reading (.5 or higher) are central to a screener's use (Dykstra, 2013).

Many screeners provide a little information about each student, but they are not well normed (*Congressional Documents and Publications*, 2015). Judicious review of universal screeners is vital to making informed educational decisions. Of high importance is understanding the foundational skills most closely predictive of reading acquisition in order to identify a screening measure closely correlated with such skills.

Phonologic and Phonemic Awareness. In 1997 from direction of Congress, the National Reading Panel (NRP) conducted a meta-analysis to determine the readiness of applying reading research to classroom practice (Foorman & Connor, 2011). Curricular

areas studied by the NRP included alphabetics (phonemic awareness and phonics), fluency, vocabulary, and comprehension (Foorman & Connor, 2011). In the area of alphabetics, phonemic awareness was identified as one of the best predictors of how children learn to read (Ehri et al., 2001). When entering kindergarten, Share et al. (1984) measured students on various measures of early literacy. The researchers then established predictive correlations between individual attributes at school entry and reading achievement at the end of kindergarten and grade one (Share et al., 1984). Results showed phonemic awareness and letter knowledge to be the two top predictors of reading achievement in kindergarten and first grade (Ehri et al., 2001). Phonemic awareness is connected to the facility with which a student manipulates the smallest units of language, individual phonemes (Ehri et al., 2001). Word reading develops when orthographic mapping is developed as students' phonemic awareness and graphemes-phoneme knowledge progresses (Ehri, 2014).

Concept of Word. Morris' model of early reading development connects with Ehri's but attends to a specific part of the progression of phonological awareness skills. Often confused with phonemic awareness, phonological awareness encompasses larger units of sounds and progresses from larger to smaller speech units (Paratore et al., 2011). Morris' model of early reading development documents a progression from beginning consonant knowledge to concepts of word in text onto phoneme segmentation ability and word recognition, with concept of word serving a linchpin role in bridging more primitive phonological awareness to a more sophisticated form of phonological awareness (Flanigan, 2007). Otherwise known as finger point reading (Ehri & Sweet, 1991) concept of word in text is "a child's awareness that spoken words match to their written

counterparts" (Flanigan, 2007). In 2003, Morris, Bloodgood, & Perney studied six kindergarten abilities (alphabet recognition, beginning consonant awareness, concept of word in text, spelling, phoneme segmentation, and word recognition) and their correlation to first grade reading achievement. Each of the factors influenced reading scores differently depending on which time (fall, winter, spring) of kindergarten the assessments were administered. Only alphabet recognition and concept of word predicted first-grade reading achievement at each testing point (Morris et al., 2003). Understanding the necessity of firm concept of word before a student is able to read words in isolation, Ford, Invernizzi, and Meyer conducted a follow-up study to determine whether concept of word in text (COW-T) predicted later sight word reading achievement in Spanish as it does in English (Ford et al., 2015). Using a multiple regression analysis, the researchers affirmed the importance of concept of word in text on reading achievement as it had the highest correlation with fall and spring first grade sight word reading (Ford et al., 2015). Even though concept of word in text is highly predictive of later reading achievement, few researchers have examined the phenomenon of concept of word and how it correlates to a comprehensive screening assessment and instructional program (Flanigan, 2007).

Alphabetics. The components of alphabetics include identifying letters, matching letters to sounds, writing letters, and understanding that letters and letter patterns represent the sounds of the language we hear and the text that we read. Alphabetic knowledge is a critical component of the sound symbol connection to word learning and phonological awareness (Jones & Reutzel, 2012). Recognizing that letter mastery predicts later literacy success, it is important to know how many letters students need to know before entering kindergarten. There is a minimum and optimum cut point for student

alphabet mastery entering kindergarten. Ideally students know 18 uppercase and 15 lowercase letters upon entrance to kindergarten. However, identifying a combination of ten upper and lower case letters has a significant negative predictive power (Jones & Reutzel, 2012). Understanding the optimal benchmarks enables improved classification accuracy in balancing negative predictive power with sensitivity specificity and positive predictive power (Piasta et al., 2012). Specificity with the classification of student need based on simple letter sound assessments empowers educators to provide powerful differentiated instruction from day one of kindergarten.

In addition to understanding the extreme importance of alphabetic knowledge, it is also imperative educational support efforts address the teacher's needs and perceptions of a program. In an experimental study with a double random assignment and a mixed-methods approach, D'Agostino et al. (2016) addressed the important role of letter-name knowledge in learning to read in conjunction with teachers' perceptions about the opportunities and challenges of using an iPad application instead of magnetic letters in Reading Recovery lessons. Data sources included pre- and post-treatment achievement data and teacher interviews. Integrating qualitative and quantitative data revealed significantly higher scores in letter knowledge for the experimental group using the iPad app, but a disconnect between teacher' beliefs about learning and the newly introduced technology. Such findings suggest a need for professional development that addresses how and why instructional routines are effective, as well as teachers' pedagogical beliefs (D'Agostino et al., 2016).

Rapid Automatized Naming. Rapid automatized naming (RAN) is one of the strongest pre-literacy screeners of dyslexia (Ozernov-Palchik et al., 2017). RAN

represents the ability to rapidly retrieve the name of visually presented items (Ozernov-Palchik et al., 2016) presented as pictures of commonly known items or letters in a series of rows on a page. Further, "RAN is thought to index the automaticity with which cognitive processes important for reading are executed and integrated" (Ozernov-Palchik et al., 2017, p. 14). As revealed in the multiple deficit model of dyslexia, not all individuals with a phonologic deficit have dyslexia (van Bergen et al., 2014). Highly predictive of later reading fluency (Paratore et al., 2011), RAN is its own unique predictive measure of dyslexia and is strongly correlated to socioeconomic status (Zuk et al., 2019).

A Closer Look at Three Potential Screening Options. Given the importance of reliability, validity, and instructional utility along with phonological awareness, phonemic awareness, vocabulary, oral language, and concept of word, and alphabetics, three potentially viable screening options emerge. First, The Kaufman Test of Educational Achievement Third Edition (KTEA-3) is a norm-referenced battery of tests for those four to 25 years of age. The KTEA has been used widely to document academic achievement and more recently as a screener for dyslexia. The dyslexia index for K-1 consists of phonological processing, letter naming facility, and letter & word recognition. The assessment takes 18-20 minutes to administer and reports a mean reliability of .92 (Breaux & Eichstadt, 2018). The KTEA-3 offers a unique opportunity to assess students for both academic achievement as well as risk for dyslexia.

Developed by colleagues at the University of Virginia Curry School of Education, the Phonological Awareness Literacy Screening (PALS) also meets much of the rigorous criteria of a worthwhile universal screener. Measuring fundamental literacy skills

(phonological awareness, alphabet knowledge, knowledge of letters sounds, spelling, concept of word, and word recognition in isolation) PALS is designed to identify students performing below grade level benchmarks with a level of specificity designed to support teachers in tailoring instruction to students' needs (Invernizzi et al., 2015). In terms of technical qualifications, PALS reports a high internal consistency (Cronbach's alpha = .89), predictive validity , inter-rater reliability from .93-.99, and test-retest reliability of .78-.92., thus proving to be a valid screening that can be used reliably with kindergarten students (Invernizzi et al., 2015). Follow-up studies have confirmed the appropriateness of the PALS screener with multiple populations. In a sample of 2844 kindergarten students, Huang and Kanold utilized an exploratory factor analysis to investigate the psychometric properties of PALS. The results supported the educational utility of PALS-Kindergarten with Spanish speaking English language learners (ELL) as well as non-ELL students (Invernizzi et al., 2015; Invernizzi et al., 2004). PALS currently does not assess rapid automatized naming. However, development of RAN protocols for kindergarten is currently underway with the first pilot wave expected to start fall 2020. Lastly, the relationship between a PALS screening and planning enriched instruction along a continuum of early literacy skills has been clearly established (*PALS*, n.d.).

In its infancy, the Boston Early Literacy Screening (BELS), also called EarlyBird is in its pilot phase of testing for predictive validity and classroom usability. As such, BELS is not currently available to all schools on the open market. EarlyBird was selected as one of eight winners by the 2019 MIT solve program. Born out of the multiple deficit model of dyslexia (Ozernov-Palchik et al., 2017), this screener developed by Dr. Nadine Gaab and the Innovation and Digital Accelerator at (IDHA) at Boston's Children's

Hospital is an app-based screener requiring minimal adult administration. Like other screeners, BELS is not intended to diagnose. Rather, BELS is designed to provide a risk profile for students scoring below the 25% and evidence-based response to screening platform (EBRS) to support early intervention. The screening battery in BELS includes the following six subtests aligned to risk indicators: rhyming & first-sound matching (phonological awareness), nonword repetition (phonological short-term memory), rapid automatized naming, letter knowledge and letter sounds, vocabulary, and oral sentence comprehension (oral listening comprehension). While not directly addressed within the app, family history and socio-economic status are also listed as risk factors within the BELS framework. EarlyBird offers teachers an efficient, self-administered screening tool and expert-vetted intervention resources designed to support a preventive approach to reading (*EarlyBird: A Screening System That Catches the Earliest Signs of Reading Disabilities*, n.d.).

Components of Effective Literacy Instruction

An incongruity between research supported components of effective literacy instruction and current practice exists (Swanson, 2008; Vaughn & Wanzeb, 2014). According to the 2020 What's Hot in Literacy Survey, 71% of respondents believe the variability of teacher knowledge and effectiveness to be the greatest barrier to equity in literacy education (Bothum, 2020). In fact, increasing professional learning and development opportunities for practicing educators is in the top five ranking topics identified as needing more attention, with a particular emphasis placed on developing a greater understanding of ways to differentiate instruction (*What's Hot in Literacy Report*, 2020). Previous research corroborates the reported challenge with systematically

developing professional capacity in literacy education (Hattie, 2002). Even with efforts to match assessments to instruction, VanDerHeyden and Burns argue there is not a direct positive relationship between screening assessments and improved reading outcomes (VanDerHeyden & Burns, 2017). Thus, of particular importance in early elementary classrooms, is the documented elusiveness of connecting screeners to inclusive and impactful literacy practices (VanDerHeyden & Burns, 2017).

Inclusive Practices

The topic of inclusive reading instruction and intervention within an RTI framework has received moderate attention in the field of literacy. However, the most effective format for ensuring best practices in the teaching of reading for all students remains unclear. Findings from the literature on the topic of inclusive reading instruction has revealed several major themes. Expert teachers and specialists deliver effective reading instruction and intervention in the classroom through informed flexibility and developing efficacy. Studies on expert teaching have shown investing in good teaching the most research-based strategy available (Allington, 2002). As synthesized by Allington's (2002) decade long observational research of expert teachers in first and fourth grades, "Students of all achievement levels benefited from exemplary teaching, but it was the lowest achievers who benefited most"(p. 744). Expert teachers provide crystal clear expectations through modelling and co-creating success criteria, setting up students for developing self-efficacy (Kracl, 2012). Of particular importance, expert teaching moves beyond a focus on explicit strategy instruction to supporting students through a gradual release of responsibility and transfer strategies from structured to independent practice (Ortlieb & Schatz, 2019).

Though expert teaching is critical to creating effective learning environments, the research shows a void in understanding how to implement the tenants of effective literacy instruction across general and special education settings. Vaughn and Wanzeb (2014) engaged in a case study across three data sources in general and special education classrooms. The studies revealed a pervasive lack of effective reading instruction. Multiple observational studies consistently found inadequate instruction for students with reading disabilities prevails in both the general and special education settings. In general, practices paramount to effective learning: time on task and active engagement in printed texts were found to be lacking (Vaughn & Wanzeb, 2014). Swanson's synthesis of observation studies of students with learning disabilities yielded similar results. Large amounts of reading instruction, regardless of the setting, was spent doing low level tasks such as worksheets and seatwork (Swanson, 2008). The resource setting provided minimally more time spent on phonics instruction than the general education setting. Further, students spent more than fifty percent of their time in the resource room completing low level undifferentiated seatwork (Swanson, 2008).

Informed flexibility is a hallmark of expert teaching. Literature on effective inclusive reading instruction places significant emphasis on the importance of informed flexibility as it relates to adjusting intensity of instruction, utilization of resources, teacher efficacy, and collective efficacy. Kracl's (2012) observational study of reading engagement in kindergarten also revealed the importance of informed flexibility as meeting the needs of diverse learners relies on the teacher's ability to balance a complex management system of carefully calibrated instruction focus and groupings.

Overall, both Swanson (2008) and Vaughn and Wanzeb (2014) documented a disconnect between research supported components of effective literacy instruction and current practice. Thus, educating teachers in developing the skills to implement inclusive effective research-based reading instruction is the call to action.

Enhanced Alphabetic Instruction

Successfully learning to read is heavily predicted by accurate, immediate letter-name recognition (Ehri & McCormick, 2013). Explicit and systematic instruction that teaches for transfer is important; the nuances of how to teacher letters and sounds make a big difference not only on acquisition of alphabet knowledge, but on global literacy achievement (Stahl, 2014). Understanding the phases of word learning and alphabetics helps teacher match the instructional technique to the processes needing to be cultivated at that phase (Ehri, 2005; Ehri & McCormick, 2013). Jones and Reutzel studied the role of alphabetic knowledge in reading acquisition. A review of literature highlighted the strong association of alphabetic knowledge (the knowledge of letter names and sound) with phonological awareness, decoding, comprehension, and spelling (Jones & Reutzel, 2012). Examples of the importance of alphabetic knowledge in predicting reading achievement for students with dyslexia, multilingual backgrounds, and low socioeconomic status was also stressed. At the time of the study (2010) many kindergarten classrooms were introducing students to one new letter per week. With this method, the vast majority of the school year passed before kindergarteners were taught all of the letters.

Given the understanding of five factors (or advantages) that influence acquisition of letter names and sounds (Jones et al., 2015), the researchers set out to determine if an

enhanced alphabetic knowledge (EAK) program with distributed cycles of instruction based on the five factors would increase success in acquiring alphabetic knowledge. The five advantages include: student's own name, letter frequency, alphabet order, letters that match their sound, oral language, and look alike (Piasta, 2014). A two-year exploratory research study of alphabetic knowledge in 13 kindergarten classrooms in urban schools in a western U.S. district was conducted. The schools were Title I schools in the school improvement program, because they had not met their annual yearly progress goals; 75% of the student were classified as English Language Learners. The study was broken into two separate years. Year one was a naturalistic quasi-experimental study including 329 kindergarten students. The control group continued teaching on letter of the alphabet a week. The experimental group taught the alphabet over 26 days, assessed the students, and then provided enhanced alphabet knowledge instruction (EAK) to students who had not learned their letters through cycles highlighting one of the five advantages. The EAK instruction was 1.5 times more effective in reducing at-risk students and 2.9 times more effective in increasing at-benchmark students than the control group. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) letter name fluency assessment was used to measure progress. During the second year of the study, all teacher implemented the EAK instruction. Results form year two mirrored year one, adding to the understanding of the effectiveness of the EAK method. Jones and Reutzel underscored the well documented understanding of the importance of alphabetic knowledge and the possibility of EAK to provide teachers with a method for how to differentiate based on student needs (Jones & Reutzel, 2012).

Making Learning Visible

Pedagogical methodology of visible learning as it pertains to teacher clarity, feedback, and assessment capable learners supports inclusive practices, and evidenced based instructional routines that lay a foundation for reading acquisition.

Teacher Clarity. Clear goals foster mastery learning, and mastery experiences are a predictor of academic achievement (Bloomberg & Pitchford, 2017). Clarifying and sharing explicit learning intentions are necessary before teachers can begin to designing effective activities for students (Hattie, 2009, 2012). One has to be clear about what one wants students to be able to do in order to accelerate learning (Wiliam, 2009). Bostas and Padeliadu specifically linked mastery goals and deeper processing. Unearthing a link between mastery goals and high achievement the researchers also discovered students with reading difficulties to be significantly less mastery oriented (Bostas & Padeliadu, 2003). The value of clear goals denotes the importance of effective feedback.

Feedback. With an effect size of d = .75 (Fisher & Frey, 2016), feedback is powerful. For feedback to work within a formative assessment framework, teachers have to understand students' current level of performance, students' expected level of performance, and action they can take to close the gap (Hattie & Clark, 2019). "Feedback from the teacher and peers can provide learners with the information they need to move incrementally toward success (Fisher et al., 2016). Specifically, short cycle formative assessment has the highest impact on achievement (Wiliam, 2009). Well-structured feedback routines develop and advance the student in both knowledge and their growth as a learner.

Assessment Capable Learners. The tenets of assessment capable earners are know where you are, know where you are going, and learn the next step toward your goal (Frey et al., 2018). Agency is developed through the goal setting during short cycle formative assessment, leading to higher effects on learning (Frey et al., 2018). An increased emphasis on clarity, feedback, and goal-oriented learning can serve as a framework for impacting early literacy achievement.

Conclusion

Focusing on treatment utility, asking how this information will benefit the child if we collect it, is critical. This mindframe must act as the beacon lighting the path between early reading screeners and instruction yielding a positive learning trajectory for students. Currently, the classroom teacher has little to do with administering screening tools that help intervene for students with dyslexia (*Congressional Documents and Publications*, 2015) and those at potential risk for reading delays. Most importantly the education community needs a method that can meet the needs of different learners regardless of their socioeconomic status (Tunmer & Nicholson, 2010).

Raising achievement matters. It is related to increased economic growth and societal health. “Our challenge as a profession is to become more precise in what we do and when we do it” (Fisher et al., 2016). A significant gap in the research literature exists. There is a lack of clarification between the types of screeners. Correlational studies connecting the subscales on screeners and the risk of dyslexia are becoming more available, but a lack of organized evidence that the mandated screeners link to increased reading achievement are remarkably scarce. Further research in the area of early literacy and dyslexia screening is needed. The READ Act (*H.R. 601, Reinforcing Education*

Accountability in Development Act | Congressional Budget Office, 2017) and other initiatives to clarify the difference between dyslexia and universal screeners, identify the efficacy of the use of various combinations of screeners as it links to reading achievement, and thus lead to clearer guidelines for implementation of best practices across states are all important. The education community will benefit from mixed method design studies addressing the practical implementation of reading screeners in kindergarten.

CHAPTER 3: METHODS

Research Paradigm

When administering and scoring quantitative data collected from academic assessments and rating scales, the researcher must remain independent and objective. While conducting interviews, the researcher must establish a fair, respectful, and trusting report between herself and the educators being interviewed. This relationship between the collection and utilization of quantitative and qualitative data calls for a mixed methods research method.

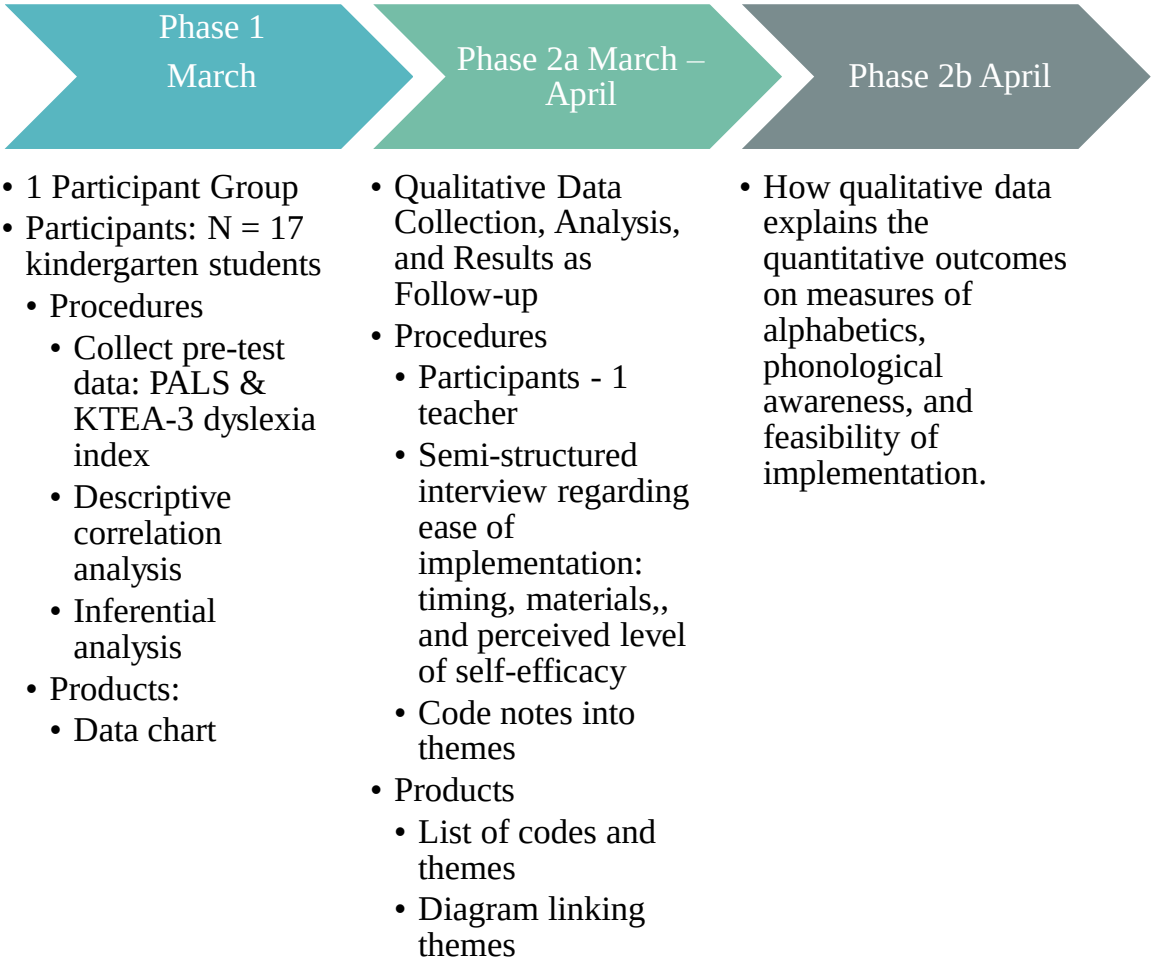
Research Design

In an effort to understand participant views within the context of the quantitative experiment, this proposed study employed a mixed methods explanatory sequential design (Creswell & Creswell, 2018). The phase one quantitative portion of the study sought to better understand the relationship between constructs on the screeners, and the teacher's perception of using the KTEA-3 and PALS screeners to create a multitiered system of supports for reading instruction. Additionally, this study addressed the convergence of the data influences on the practical implementation of reading screeners in kindergarten.

During the phase one implementation the researcher administered participants the KTEA-3 dyslexia screener and the classroom teacher administered the PALS literacy screener. During phase two, qualitative procedures included a semi-structured interview of the classroom teacher and coding interview notes to identify themes, engaging in data reduction, and triangulating data to elaborate, enhance, and clarify the quantitative results (Creswell, 2014; Johnson & Onwuegbuzie, 2004).

Figure 1

Design Overview



Research Questions

This study was guided by the following research questions:

1. What is the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener?
2. What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multi-tiered system of supports for reading instruction in an inclusive kindergarten setting?

3. How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

Phase One Quantitative Study

Participants and Sampling

This mixed methods explanatory sequential study design addressed the relationship between the constructs on the KTEA-3 and PALS literacy screeners. A convenience sample of 17 kindergarten students ranging in age from 5.0-6.4 was recruited from one kindergarten class in a suburban neighborhood. Additionally, one classroom teacher was recruited for this study. The participants were drawn from a parochial school in a middle to upper middle-class neighborhood. Enrollment in the school consisted of a preschool three and four-year-old program, an elementary school with students in kindergarten to grade five, and a middle school with grades six to eight. The total school population was approximately 530 students with two to three classes per grade. The kindergarten class of students involved in the study was one of two kindergarten classes with a teacher to student ratio of 20 to one. Both kindergarten classes were also supported with full time instructional aides.

Each parent of a participant of this study was contacted by letter, and the study explained to him or her. Respondents who agreed to have their child participate were informed of their right to privacy, and of the possibility of educational impact. Parents were also notified of their right to withdraw their child from the study at any point. Pseudonyms were used throughout this study to ensure confidentiality.

Quantitative Phase Research Design

This study employed a mixed methods explanatory sequential design. The quantitative study utilized convenience sampling and sought to include the participants representative of the distribution of a full class of kindergarten students. The quantitative portion of the study occurred between February and early March of 2020. The classroom teacher administered the PALS assessment and this researcher administered the KTEA-3 assessment. The PALS assessments were administered in individual and small group settings as prescribed in the administration manual. The KTEA-3 assessment was administered on an individual basis. The PALS and KTEA-3 assessments were administered in person within the kindergarten classroom setting and both the PALS and KTEA-3 assessments took between 15 to 20 minutes to administer.

A Cronbach's alpha was conducted to determine the internal reliability on each of the PALS and KTEA-3 screening measures. Additionally, SPSS software was utilized to conduct a Pearson r correlation coefficient. The significance of the correlation coefficients was evaluated by testing the null hypothesis of no significant correlation between the constructs in the KTEA-3 and PALS (H_0:$p = 0$) against the alternative hypothesis, there is a significant correlation between the constructs in the KTEA-3 and PALS (H_1: $p \neq 0$).

Instruments

Reading skills were measured using the Phonological Awareness Literacy Screening (PALS) and The Kaufman Test of Educational Achievement Third Edition (KTEA-3). The PALS assessment measures important literacy fundamentals predictive of reading success including rhyme and beginning sound awareness, concept of word, letter

and sound identification, and spelling. The KTEA-3 is a norm-referenced battery of tests for those four to 25 years of age. The KTEA has been used widely to document academic achievement and more recently as a screener for dyslexia. The dyslexia index for K-1 consists of phonological processing, letter naming facility, and letter & word recognition. The assessment took 18-20 minutes to administer and reports a mean reliability of .92 (Breaux & Eichstadt, 2018). The KTEA-3 offered a unique opportunity to assess students for both academic achievement as well as risk for dyslexia.

Description of Subtests

The following is a list of subtests descriptions as provided the in the test battery manuals (Kaufman & Kaufman, 2014; *PALS*, n.d.).

PALS.

Rhyme Awareness. Out of a set of three pictures, students are asked to identify the one that rhymes with the target picture. There are ten items; students who perform below expectation on the group rhyme task take the task in an individual format.

Beginning Sound Awareness. Out of a set of three pictures, students are asked to identify the one that has the same beginning sound as the target picture. There are 10 items; students who perform below expectation on the Group Beginning Sound task take the task in an individual format

Alphabet Knowledge. Students are asked to name the 26 lower-case letters of the alphabet.

Letter Sounds. Students are asked to produce the letter sounds of 23 upper-case letters of the alphabet, as well as three digraphs.

Spelling. Students spell five consonant-vowel-consonant words, receiving credit for phonetically acceptable substitutions.

Concept of Word. The Concept-of-Word task measures children's ability to (a) accurately touch words in a memorized rhyme, (b) use context to identify individual words within a given line of text, and (c) identify words presented outside of the text.

KTEA-3.

Phonological Processing. The examinee responds orally to items that require manipulation of the sounds within words.

Letter Naming Facility. The examinee names a combination of upper and lowercase letters as quickly as possible.

Letter & Word Recognition. The examinee identifies letters and pronounces words.

Descriptive Analysis

A Pearson correlation coefficient was used to determine the strength of linear relationship between dependent variables on the KTEA-3 and PALS subtest as well as the total dyslexia index standard score on the KTEA-3 (Cronk, 2012). The data was analyzed to determine the size of correlation: weak, moderate, and strong. Additionally, a Cronbach's alpha was conducted to determine the internal reliability of the scores within each assessment measure. The results will be discussed along with implications for screening measures and sustainable early literacy programs.

Phase Two Qualitative Study

The teacher engaged in a semi-structured interview at the conclusion of the quantitative study. Semi-structured interviews evoke elaboration regarding question

responses and provide both guidance and flexibility during the interview process (Lichtman, 2013). A multiple deficit model of reading disability guided the coding process (Pennington, 2006). Open coding of journals and interview transcripts involved a six-step process: initial coding of words and phrases, revised initial coding, initial list of categories, modification of the initial list, revision of categories, and conversion of categories into concepts/themes (Lichtman, 2013). In addition to an emphasis on foundational literacy skill acquisition, particular attention was given to social and cultural constructs and the recursive nature of knowledge construction (McVee et al., 2013) as it relates to the educator's perceptions of self-efficacy in themselves and the students.

Given the nature of the design, reflexivity (self-examination of the researcher's thoughts) were an essential component of the qualitative analysis. Reflexivity allows researchers to acknowledge bias, and the "cause-and-effect loop between what is being researched and the researcher" (Lichtman, 2013, p. 158). Through reflexivity, I sorted through my own biases while also questioning various practices (Lichtman, 2013). Reflexivity requires introspection in the moment, which leads to mindfulness, growth, change, and improvement. Consequently, I observed and reflected with an emphasis on trust, trustworthiness, collaboration, and corroboration with participants (Attia & Edge, 2017).

Phase Three Integration

Integration of the data is presented in a joint display. Such a display includes a column of qualitative results with themes derived from the qualitative content analysis in the column to the right. The third column addresses how qualitative findings helped to explain the quantitative results (Creswell, 2014). Triangulation of the data was aimed to

understand the correlation between screening constructs along with the feasibility of conducting such screenings in classrooms. Combined, the results from the quantitative PALS and KTEA-3 coupled with the qualitative interview created an understanding of the essential constructs in a reading screener and related elements necessary for sustainable implementation within an inclusive kindergarten setting.

Ethical Considerations

The teacher participant agreed to and signed a document indicating her informed consent. Additionally, parents of kindergarten students singed a document indicating their informed consent. Participants' parents were advised of their child's rights to privacy. The educator participant was advised that her participation in the implementation and responses during interviews will in no way affect their formal evaluation.

Plan for Presenting the Results

The results from this mixed methods study were included in the dissertation report and may potentially be published in journals focusing on teacher professional capacity and early literacy.

Discussion

"Our challenge as a profession is to become more precise in what we do and when we do it" (Fisher et al., 2016, p. 36). A screening and instructional method that can be adjusted to fit the varying needs of learners, no matter their socioeconomic status, and inspire them to become readers (Tunmer & Nicholson, 2010) is needed. This study addressed the correlation between constructs in literacy screeners and enlightens the field regarding necessary components of constructs in each screener. Additionally, this study attended to the practical elements of implementing screeners in an inclusive kindergarten

setting. Quantitative methods focus on achievement scores on a literacy and dyslexia screener. The qualitative portion highlighted a teacher's sense of self-efficacy connected to administering and interpreting screeners as well as implications for including screeners in a comprehensive literacy program. The data was analyzed and integrated with recommendations for future instruction developed. Overall, such an in-class method of early literacy assessment seeks to further develop emergent literacy perspectives and establish instructional systems and routines that can be generalized to provide high impact literacy instruction to all students.

CHAPTER 4: RESULTS

Introduction

This mixed methods explanatory sequential study was conducted to examine the relationship between constructs on the screeners, the teacher's perception of using the KTEA-3 and PALS screeners to create a multitiered system of supports for reading instruction, and how the convergence of the data influences the use of reading screeners in kindergarten. The literature review highlighted a more recently introduced multiple deficit model of dyslexia (reading disability) illustrating the influence of environmental, cognitive, and neurological factors in reading acquisition (Ozernov-Palchik et al., 2016). A multiple deficit model emphasizes the importance of both rapid naming and phonemic awareness in reading and advocates letter knowledge, naming or processing speed, and phoneme awareness as critical components of literacy screeners (Pennington et al., 2012). The PALS screener has a concept of word subtest which serves as a sensitive measure of the necessary reading skill of voice to print matching but does not offer a rapid naming or processing speed subtest in kindergarten. The KTEA-3 screener does have a rapid naming subtest but does not attend closely to concept of word. Therefore, the research was implemented to attend to the practical utility of the PALS and KTEA-3 reading screeners through examining the correlation between the constructs on the screeners and the teacher's perceptions regarding the feasibility and sustainability of implementing the screenings within a multi-tiered system of supports.

This study was guided by the following questions:

RQ1: What is the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener?

RQ2: What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multitiered system of supports for reading instruction in an inclusive kindergarten setting?

RQ3: How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

Description of Sample

This study took place in a kindergarten classroom within a parochial, suburban school in the Western United States. The researcher provided the principal, teacher, and parents with an in-depth description of the study. Of the 20 students in the kindergarten class, the parents of seventeen students agreed to have their child participate in the study. Demographic data indicated ten male and seven female students participated in the study with eight identifying as Caucasian, six as multiple ethnicities, and three as Asian descent. The classroom teacher was a Caucasian female with a teaching credential and Master of Education in elementary education. Described as Mrs. Bennett in this study, this teacher was serving in her second year as one of two kindergarten teachers at this school. Prior to her tenure in kindergarten, Mrs. Bennett taught grades two and four at another school site, accumulating four years of teaching experience.

After data analysis, the classroom teacher then participated in a semi-structured interview (See Appendix D) in April 2020 focused on her general perceptions of the administration of the assessments, her own self-efficacy related to the assessments, feasibility, and sustainability of utilizing the reading screeners within an MTSS framework. Due to school closures for COVID-19 as of March 15, 2020, the semi-structured interview was conducted over the phone as this researcher typed notes during

the interview. Careful consideration was given to recording the teacher's responses with fidelity.

Quantitative Data Results

Data Cleaning

An essential process prior to data analysis, data cleaning is the process of detecting, diagnosing, and editing faulty data (Van den Broeck et al., 2005). To ensure accuracy and relevancy to the study, the researcher engaged in the following data cleaning process. Since the assessments were recorded on paper and digitally, the researcher first scanned the data to ensure all subtests were administered and recorded accurately. One student was found to have a missing subtest score. During the diagnostic phase (Van den Broeck et al., 2005) the researcher discovered the missing data point was due to the interruption of in person education resulting from the COVID-19 stay at home orders. Thus, the missing data was treated by removing the student's scores from the overall data analysis. The remaining subtests were verified to have been administered and recorded accurately. Data was then imported to Excel spreadsheets and SPSS for analysis.

Descriptive Statistics

The purpose of question one is to examine the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener. Correlations between the constructs on the screeners were analyzed using the Pearson r correlation coefficient. The significance of the correlation coefficients was evaluated by testing the null hypothesis of no significant correlation between the constructs in the KTEA-3 and PALS (H_0:$p = 0$) against the alternative hypothesis, there is a significant correlation between

the constructs in the KTEA-3 and PALS (H_1: $p \neq 0$). Figure 2 presents the correlational analysis in which statistically significant correlations ranged from r = .499 - .894 (p .000 - <.05).

Correlations within the KTEA-3 varied (see Table 1). However, all three subtests, phonological processing, letter & word recognition, and letter naming facility all significantly correlated with the total dyslexia index at the p =.01-.05 level. Correlations between phonological processing and dyslexia index were moderate yielding results of r = .695 (p = .003). The correlation between letter word recognition and total dyslexia score was moderate and found to be r = .612 (p = .012). The largest correlation found between letter naming facility and total dyslexia index was strong with r = .894 (p = .000).

Table 1

KTEA-3 Construct Correlations

	Phonological Processing Standard Score	Letter & Word Recognition Standard Score	Letter Naming Facility Standard Score	Dyslexia Index Standard Score
Phonological Processing Standard Score	1	.088	**.499***	**.695****
Letter & Word Recognition Standard Score	0.088	1	0.373	**.612***
Letter Naming Facility Standard Score	.499*	0.373	1	**.894****
Dyslexia Index Standard Score	**.695****	**.612***	**.894****	1

Note. *p < .05, two-tailed, **p <.01, two-tailed

Figure 2

Correlations Between Constructs on the PALS and KTEA-3 Screeners

Correlations

	Phonological Processing Standard Score	Letter & Word Recognition SS	Letter Naming Facility SS	Dyslexia Index SS	PALS Alphabet Recognition Criterion Score	PALS Letter Sounds Criterion Scores	PALS Spelling Criterion Referenced Score	PALS COW Pointing Criterion Score	PALS COW Word ID Criterion Score	PALS COW List Criterion Score
Phonological Processing Standard Score	1	0.088	.499*	.695**	0.097	0.327	0.139	0.051	-0.108	0.108
Letter & Word Recognition SS	0.088	1	0.373	.612*	0.274	.635**	0.409	.561*	0.382	.694**
Letter Naming Facility SS	.499*	0.373	1	.894**	0.318	0.339	0.177	0.412	0.115	0.373
Dyslexia Index SS	.695**	.612*	.894**	1	0.296	.562*	0.293	0.462	0.135	0.484
PALS Alphabet Recognition Criterion Score	0.097	0.274	0.318	0.296	1	.559*	.683**	.617*	0.437	0.467
PALS Letter Sounds Criterion Scores	0.327	.635**	0.339	.562*	.559*	1	.764**	.715**	0.119	.597*
PALS Spelling Criterion Referenced Score	0.139	0.409	0.177	0.293	.683**	.764**	1	.750**	0.089	0.355
PALS COW Pointing Criterion Score	0.051	.561*	0.412	0.462	.617*	.715**	.750**	1	0.092	0.455
PALS COW Word ID Criterion Score	-0.108	0.382	0.115	0.135	0.437	0.119	0.089	0.092	1	0.342
PALS COW List Criterion Score	0.108	.694**	0.373	0.484	0.467	.597*	0.355	0.455	0.342	1

*. Correlation is significant at the 0.05 level (2-tailed).

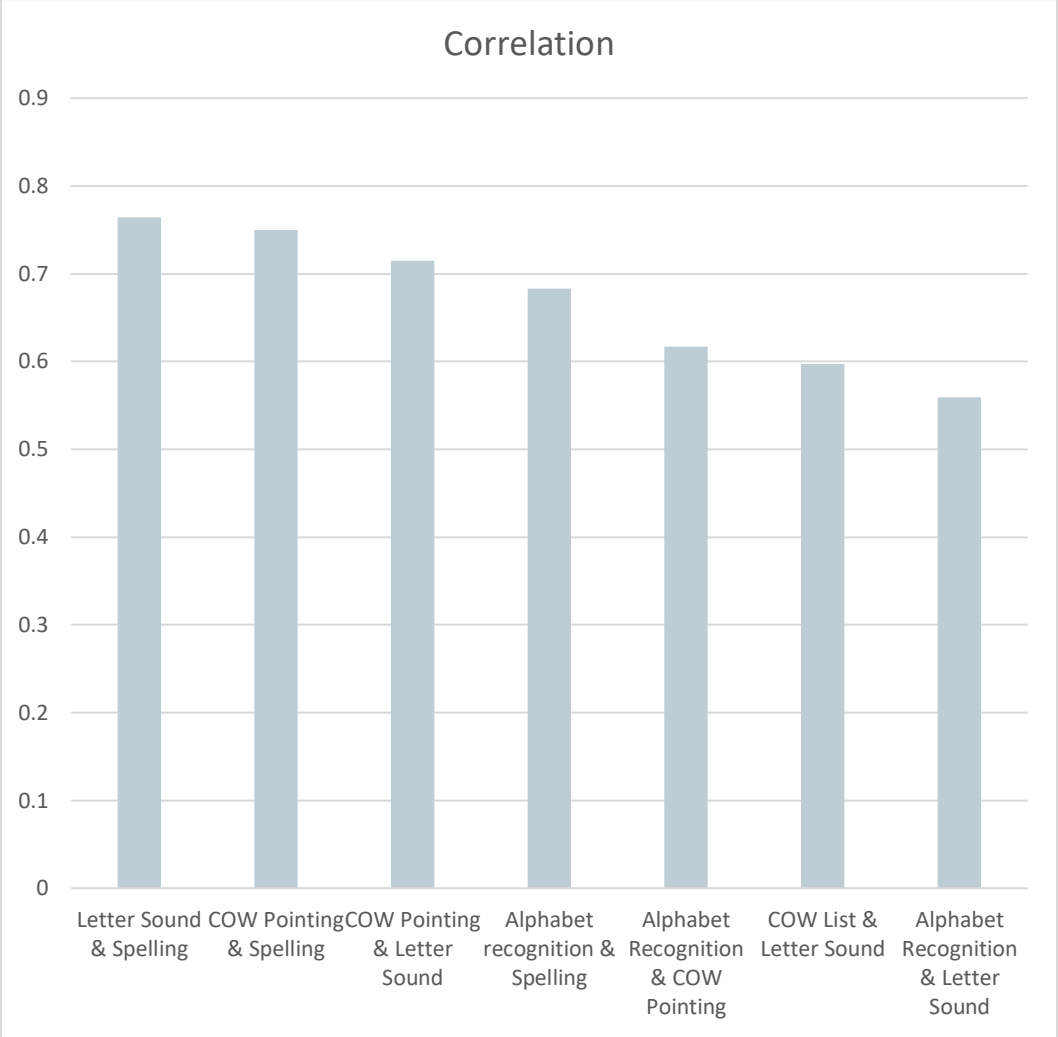
**. Correlation is significant at the 0.01 level (2-tailed).

c. Cannot be computed because at least one of the variables is constant.

Within the PALS screener, levels of correlation varied from weak to strong. The highest correlations coefficients between different subtests was found between letter sound and spelling with r = .764 (p = .001). Other subtests yielding strong correlations included concept of word pointing and spelling as well as concept of word and letter sound. Correlation between concept of word pointing and spelling yielded results of r = .750 (p = .001). The correlation between concept of word pointing and letter sound was found to be r = .715 (p = .002). The remainder of the significant correlations were moderate. Correlations between alphabet recognition and spelling yielded results of r = .683 (p = .004). Alphabet recognition also yielded a moderate correlation of r = .617 (p = .011) with concept of word pointing. Concept of word list and letter sound subtests yielded a correlation of .597 (.015). Correlations between alphabet recognition and letter sound subtests yielded results of r = .559 (p = .024). Correlations could not be calculated for the PALS group rhyming and PALS beginning sound subtests due to a ceiling effect of all students earning the maximum score of 10 on both the subtests. All other correlations within PALS were not found to yield significant results.

Figure 3

Correlations Within the PALS Screener



The strongest correlation between the KTEA-3 and PALS assessments was found between the KTEA-3 letter word recognition subtest and the PALS concept of word list subtest which yielded a moderate correlation of r = .694 (p = .003). The letter & word recognition subtest on the KTEA-3 generated the highest number of correlations with the PALS subtests. Correlations between KTEA-3 letter and word recognition and PALS letter sound yielded results of r = .635 (p. = .008). Correlations between KTEA-3 letter & word recognition and PALS concept of word yielded results of r = .561 (p = .024) with

concept of word pointing and r = .694 (.003) with concept of word list. The KTEA-3 total dyslexia index score yielded a moderate correlation with the PALS letter sound subtest, r = .562 (p = .024). Both the phonological processing and letter naming facility subtests on the KTEA-3 did not yield any significant correlations with the PALS assessment (See Figure 2). Due to the significant correlation between the KTEA-3 total dyslexia index score and the PALS letter name construct as well as the KTEA-3 letter and word recognition subtest with three PALS subtests (letter name, concept of word pointing, and concept of word list), the null hypothesis is rejected and the alternative hypothesis is accepted.

In addition to the correlation between scores, the overall findings of each screener merit reporting. All students reached all benchmark ranges on each subtest of the PALS assessment. Whereas, the KTEA-3 identified one student with having a moderate risk for dyslexia, one with an elevated risk, two as low risk, and the remaining 12 students as have a very low risk for dyslexia (see Figure 4).

Analysis of Quantitative Assessment Results

The researcher examined the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener. The significance of the correlation coefficients was evaluated by testing the null hypothesis of no significant correlation between the constructs in the KTEA-3 and PALS (H_0:$p = 0$) against the alternative hypothesis, there is a significant correlation between the constructs in the KTEA-3 and PALS (H_1: $p \neq 0$). Significant correlations were found within and between constructs, therefor the null hypothesis is rejected.

The KTEA-3 Letter naming facility had a moderate (.499) correlation with the KTEA-3 phonological processing subtest and a large (.894) correlation with the overall dyslexia index score on the KTEA-3. Of all of the subtests across PALS and KTEA-3, the KTEA-3 letter naming facility and total dyslexia index score were the most strongly correlated at r = .894 at an .01 level of significance. This supports the multi deficit model and positions rapid naming as its own unique construct as well as a critical component of reading screeners. Additionally, a strong correlation was found between the KTEA-3 letter word recognition subtest and the PALS concept of word list subtest r = .694 (p = .003). The concept of word test and the letter naming facility tests are unique to the KTEA-3 and PALS screeners respectively; there are no subtests on the other screener that replace assessment of these skills. The significant correlation of the concept of word and letter naming facility tests with other constructs supports the multiple deficit theory and demonstrates the importance of each of these constructs being present in a comprehensive screening assessment.

Figure 4

KTEA-3 Test Battery Scores and Risk Indicators

Paricipant	Phonological Processing		Letter & Word Recognition		Letter Naming Facility		Dyslexia Index Standard Score	Risk for Dyslexia
13332333	119	Very Low	123	Very Low	132	Very Low	125	Very Low
13332909	121	Very Low	104	Very Low	108	Very Low	109	Very Low
13251664	92	Low	97	Low	76	High	84	Moderate
13332950	85	Elevated	100	Very Low	104	Very Low	93	Low
13332992	119	Very Low	127	Very Low	158	Very Low	140	Very Low
13333171	97	Low	84	Moderate	96	Low	87	Elevated
13368256	87	Elevated	115	Very Low	112	Very Low	103	Very Low
13369489	80	Moderate	132	Very Low	73	High	91	Low
13369360	110	Very Low	104	Very Low	102	Very Low	104	Very Low
13369489	108	Very Low	92	Low	106	Very Low	101	Very Low
13405448	105	Very Low	100	Very Low	94	Low	98	Very Low
13405458	87	Elevated	116	Very Low	113	Very Low	104	Very Low
13422584	119	Very Low	104	Very Low	100	Very Low	106	Very Low
13422711	123	Very Low	123	Very Low	113	Very Low	120	Very Low
13422799	110	Very Low	127	Very Low	106	Very Low	113	Very Low
13422950	110	Very Low	104	Very Low	92	Low	101	Very Low
Average	104.5		109.5		105.31		104.94	

Risk for dyslexia	
40-69	Very High
70-76	High
77-84	Moderate
85-89	Elevated
90-97	Low
98-160	Very Low

In addition to correlation analyses, Cronbach's alpha was used to evaluate internal consistency. Cronbach's alpha for the KTEA-3 subscales in the current study was .814. Though the results are lower than the reported mean reliability of .92 (Breaux & Eichstaedt, 2018), both sets of results demonstrate strong internal consistency. Cronbach's alpha for the PALS subscales was .766 for this current study as compared to the reported internal consistency of .89 (Invernizzi et al., 2015). Though the current study revealed a slightly lower average correlation between items on the PALS and KTEA-3 as compared to reported internal consistency, all measures are above .70 and considered to demonstrate strong internal reliability.

Qualitative Data Results

Research Question 2: What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multi-tiered system of supports for reading instruction in an inclusive kindergarten setting?

A semi-structured interview was used for collecting and analyzing data in the second, qualitative phase (Creswell & Plano Clark, 2018). The semi-structured interview served the purpose of providing focus for the questions while also allowing for the flexibility needed to augment questions in order to garner the underlying meaning of responses (Lichtman, 2013). The content of the interview protocol was grounded in the results from the quantitative phase, with the goal of elucidating results from screening instruments and their practical application in the classroom (Creswell & Plano Clark, 2018). The ten core open ended questions were thoughtfully constructed to allow the participant to elaborate on a topic as well as provide the interviewer the opportunity to elicit more information through follow-up questions (Creswell & Plano Clark, 2018). In compliance with the COVID-19 social distancing restrictions, the semi-structured interview was conducted over the phone during April 2020. The researcher sent the questions to the participant in advance. The interview was transcribed through typed notes taken by the researcher during the phone interview. Steps in the qualitative analysis included bracketing and a generic coding method: (1) initial open coding of words and phrases; (2) revisiting initial coding; (3) initial listing of categories; (4) Modifying the initial list; (5) Revisiting categories; (6) generating themes (Lichtman, 2013).

Bracketing

Self-disclosing assumptions, beliefs, and biases cultivate increased validity (Creswell & Miller, 2000). Operating within a critical paradigm, this researcher engaged in reflexivity necessary to bracket thoughts and presuppositions in order to foster neutrality (Creswell & Miller, 2000). Accordingly, the researcher engaged in a reflexive review of the interview questions, respondents' answers, and clarifying statements made during the interview process. This engagement in reflexivity allowed the researcher's biases to surface. After bracketing, it was found questions were already organized into categories based on researcher credence of importance. An examination of the respondent's answers revealed the administration of PALS by the teacher and KTEA-3 by the researcher contributed to the perception of both screening measures. Additionally, emphasis of certain elements of screening made by the researcher during clarifying statements had the potential to affect the respondent's follow-up comments. Overall, engaging in reflexivity allowed the researcher to revisit responses made by the respondent and ensure comments were received as they were intended by the participant. The full six-phase analysis is discussed in the following section.

Phase One: Initial Open Coding of Words and Phrases

The first stage analysis involved open coding in which the researcher chunked the interview data into keyword and larger phrases. An emphasis was placed on creating familiarity with data, checking transcripts for accuracy, and beginning to establish a general list of codes (Braun & Clarke, 2006; Lichtman, 2013). Data was organized in a systematic fashion with an emphasis on connecting data to the research questions and across the entire data set (Braun & Clarke, 2006).

Phase Two: Revisiting Initial Coding

During phase two, an initial list of data were recoded by renaming synonyms and consistently coding attributes to more carefully connect related terms (Lichtman, 2013). For instance, “I liked doing it on my own” and “gives me a better understanding if I administered” became independent. Longer phrases such as “correlation between screeners and standards” were condensed into the key words correlation and standards. Responses were organized related to PALS, KTEA-3, and sustainability. During the implementation of phase two, the frequency of repetitive, meaningful words was noted creating a numerical chart regarding frequency of key terms (see Table 2).

Table 2

Open Coding of Key Terms by Frequency

	Code	Number of times code occurred in respondent's statements
PALS		
C1:	Efficient assessment	8
C2:	Input	8
C3:	Correlation	4
C4:	Interpretable	3
C5:	Independent	3
C6:	Standard	3
C7:	General screener = everyone	1
C8:	Relevant correlation between standards and assessment	1
KTEA-3		
C9:	Dependent	5
C10:	Tier-2	4
C11:	Inexperienced	4
C12:	Lengthy	2
C13:	Dyslexia	2
C14:	Detailed screener = specific students	1
Sustainability		
C15:	Conversation	4
C16:	Specialist	2
C17:	Build	2
C18:	Parent relationships	1
C19:	Open communication	1
C20:	Clearly articulate purpose	1
C21:	Create a team	1
C22:	Put a plan in place	1
C23:	Professional development	1
C24:	Stages of development	1

Phase Three: Initial Listing of Categories

Frequency of key words was reflected when creating initial categories. Additionally, codes and categories reflected affective perceptions, as in feelings and attitude, of the KTEA-3 and PALS screeners. A sentiment analysis was conducted (*Monkeylearn.Com*, 2020) and revealed a 97.9% positive rating regarding PALS and a

61.2% neutral rating for KTEA-3. From there, the most frequent codes and other highly relevant codes were organized into an initial list of categories (see Table 3).

Phase Four: Modifying the Initial List

The iterative process of creating categories continued as the initial list of categories and supporting codes was reviewed for importance and areas of commonality (Lichtman, 2013). On overlap of a multitiered literacy plan and comprehensive teams was found. Additional commonalities were found within the multitiered literacy plan and the positive affective responses associated with heightened self-efficacy.

Phase Five: Revisiting Categories

In this phase the researcher removed redundancies and connected the critical elements found across the areas of creating a multitiered literacy plan, a comprehensive literacy team, and heightened self-efficacy (Lichtman, 2013). This phase culminated with candidate categories and subcategories lending themselves to the development of overarching themes (Braun & Clarke, 2006).

Table 3

Initial List of Categories

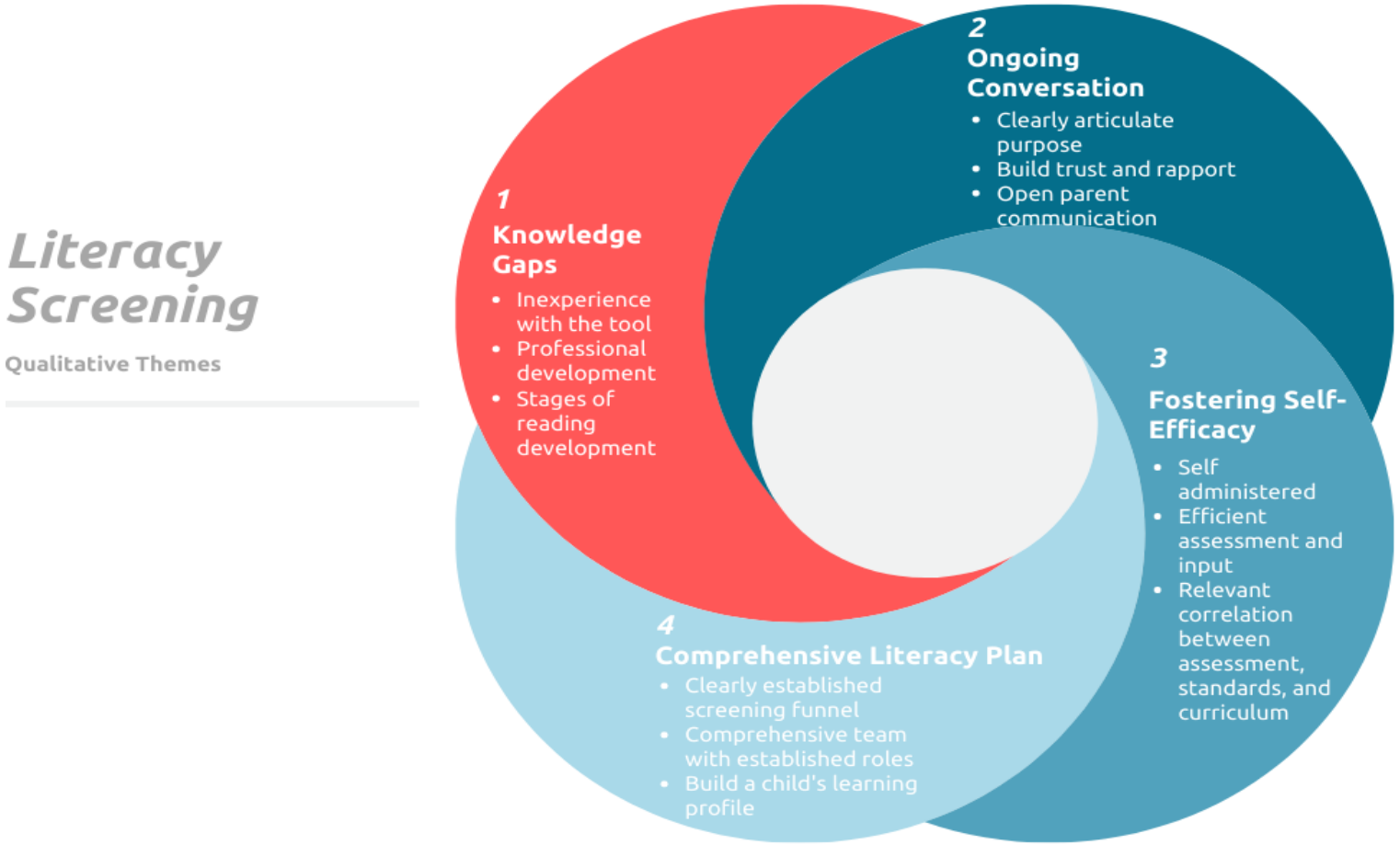
Ongoing Conversation	Multitiered Literacy Plan
C:14 Ongoing conversation	C10: Tier-2
C:17 Build trust and rapport	C13: Dyslexia
C:18 Parent relationships	C17: Build a child's learning profile
C:19 Open communication	C7: General screener = everyone
C:20 Clearly articulate purpose	C14: Detailed screener = specific students
Comprehensive Team	**Heightened Self-Efficacy**
C:12 Work with specialists	C1: Efficient assessment
C:21 Create a team	C2: Input
C:22 Put a plan in place	C3: Correlation
	C4: Interpretable
	C5: Independent
	C8: Relevant correlation between standards and assessment
Gaps Creating Friction	
C6: Dependent	
C8: Inexperienced	
C9: Lengthy	
C23: Professional development	
C24: Stages of development	

Phase Six: Generating Themes

The final step captured the importance of the data in relation to the research questions and established a patterned response within the data set (Braun & Clarke, 2006). The codes served as guideposts and key words for developing concepts/themes (see Figure 5).

Figure 5

Qualitative Themes and Corresponding Codes



Presentation of Data and Results

The following four main themes emerged from the analysis of respondent data: knowledge gaps, ongoing conversation, fostering self-efficacy, and comprehensive literacy plan. The first theme highlights the challenges of literacy screening while themes two through four explicate elements of supporting and sustaining screening methods.

Theme 1: Knowledge Gaps

Inexperience with the Tool. As the bracketing process revealed, the researcher's administration of the KTEA-3 assessment affected the teacher's affective perception of the assessment. The KTEA-3 differs from the PALS in that it is specifically described as a dyslexia screener. While the screening battery is not intended to diagnose dyslexia, administration and interpretation of the assessment requires careful attention to student responses (Flanagan et al., 2017). When discussing the KTEA-3 within a MTSS framework, the respondent stated, "It's a bit nerve wracking, because I don't have a lot of experience with it." This feeling of tension experienced by the teacher is commensurate with research conducted by Tschannen-Moran and McMaster (2009) in which demonstration without follow-up coaching led to a decrease in teacher's sense of self-efficacy for reading instruction.

Professional Development. Questions regarding the teacher's understanding of and educational background around dyslexia buttressed the discomfort created by a lack of focused development in keystone facets of reading development. Though this teacher (given the pseudonym Mrs. Bennett) has a teaching credential and master's degree in elementary education, she explained, "I didn't have classes that specifically taught about it (dyslexia). It was generally talked about. The instructor taught about differentiation, but

I didn't have much sustained education in the dyslexia area." As researched by Tschannen-Moran and Hoy (2007), mastery experiences serve as the strongest contribution to self-efficacy judgements for both novice and experienced teachers. Mrs. Bennett reported a strong sense of self-efficacy in regard to providing high impact differentiated instruction in foundational literacy skills and attributed her stronger sense of efficacy to the kindergarten and literacy coaches hard work and focus on alphabetics and concept of word instruction over the past two years. A lack of modeling and opportunities to cultivate mastery experiences around dyslexia and other core components of reading development within teacher education program and professional development offerings contributed to her discomfort with the KTEA-3 screeners and the topic of dyslexia. Overall, Mrs. Bennett expressed the desire for more focused professional development "I'd like to receive more PD in the area of more advanced screeners like a dyslexia screener, especially in the younger grades where it's important to look into these areas early."

Stages of Reading Development. Mrs. Bennett reported teacher preparation programs as offering general discussion around differentiation and textbook explanations of dyslexia. The respondent articulated a desire for a more explicit form of education, "It would be nice to have it broken down with what to expect in each stage of development." Typical reading development is characterized by a sequence of overlapping phases with each phase of development characterized by a predominant type of linkage between orthographic patterns to pronunciation in memory (Ehri, 2014). A combination of the research and respondent's responses may indicate teacher preparation and professional

development offerings need to include instruction explicating the nuances of the phases of reading development with modeling and coaching that facilitate mastery moments.

Theme 2: Ongoing Conversation

Clearly Articulate Purpose. A well-defined purpose clearly articulated to the parents was identified by this teacher as a launch pad for creating fruitful ongoing conversations. As Mrs. Bennett reports, “It’s the most intimidating thing as a teacher not having the information coming in, assess, and then breach the topic of dyslexia or reading support.” Mrs. Bennett continued, “An assessment/screening funnel needs to be clearly articulated to parents and staff from the very beginning.”

Build Trust and Rapport. “A big part of teacher and parent relationships is building trust and rapport.” Openness and honesty with assessment plans, data, and educational implications was identified as a key component of building the level of trust and rapport necessary to partner with parents in their child’s educational planning. Mrs. Bennett indicated it is intimidating to enter a conversation around assessment results, “if we don’t have a foundation and we haven’t previously opened this conversation.”

Open Parent Communication. Mrs. Bennett identified the beginning of kindergarten as an opportune time in which to open communication regarding the assessment funnel. Communicating screening assessments as part of the instructional plan offers an opportunity to change the tone of the conversation with parents. “We need to change the conversation from acceptance and nonacceptance.” Rather than only emphasizing kindergarten readiness, this teacher views literacy screeners as an opportunity to meet student needs “from the get-go.”

Theme 3: Fostering Self-Efficacy

Self-Administered. Independently administering and inputting assessment data were some of the most common occurring key words. Mrs. Bennett iterated why administering the assessment herself is important, "I liked doing the PALS on my own because it gives me a better understanding if I've administered the test and seen the results." The ability to independently administer an assessment allowed for inclusive assessment practices within the classroom setting. On the other hand, not administering the KTEA-3 assessment left this teacher feeling less confident in interpreting the results at a deeper level and uncomfortable with speaking to parents about the assessment results. Finally, independently administering the assessment was identified by Mrs. Bennett as offering her the ability to identify student's needs as a first step in a multitiered system of supports, followed by partnering with a reading specialist and other experienced peers for the following phases of assessment.

Efficient Assessment and Input. Mrs. Bennett described PALS as "really practical" and "time efficient." This teacher went on to describe the elements of the PALS screener that made her feel it was a practical assessment. " I like the mix between small group and one to one. I was able to assess and put in the data in a two-week time frame. Inputting it is easy. I liked the online input they have." Ease of inputting and retrieving data as well as length of assessment emerged as key contributors to a practical assessment.

Relevant Correlation between Assessment, Standards, and Curriculum. The importance of a strong association between the assessment, instructional materials, and report cards emerged as a crucial component of literacy screeners. Such an emphasis on

the connection was evident when Mrs. Bennett described the PALS assessment, “All of the information I gained, I can correlate between the screener and the standards. I could use the data for creating reading groups, measuring mastery against the standards, and communicating to parents.” When discussing the subtests on the PALS assessment, Mrs. Bennett stated, “They were all pretty useful.” She went on to highlight the letter naming and letter sound identification as critical to know on the screener and communicate on the report cards. Mrs. Bennett elucidated the importance of the spelling assessment, “the students can wiggle their way around with rhyme or beginning sounds, but the spelling can really identify what they can do independently and ties into Fundations (the classroom phonics curriculum).” A desire to connect assessment to both risk and instructional planning has emerged as categorizing assessments as either screening or diagnostic assessments (*Assessment,* 2014). Mrs. Bennett’s description of screening assessments in practice in the kindergarten classroom pointed to a more nuanced approach of screening that combined both risk indicators and information fostering calibrated differentiated instruction within the classroom setting. Such an approach is commensurate with culturally responsive instruction and multiple deficit model of reading acquisition addressing the following cognitive and environmental risk indicators: phonological awareness, phonological short-term memory, rapid automatized naming, letter (sound) knowledge, vocabulary, oral listening comprehension, family history and socio-economic status (Ozernov-Palchik et al., 2016).

Theme 4: Comprehensive Literacy Plan

Clearly Established Screening Funnel. The interview conversation frequently surrounded the importance of an ongoing conversation within a well-orchestrated

comprehensive literacy plan. Mrs. Bennett emphasized the need to "put a game plan in place." Elaborating on her statement, Mrs. Bennett asserted an, "assessment/screening funnel needs to be clearly articulated to parents and staff from the very beginning." Respondent answers demonstrated such a funnel would fit within an MTSS framework beginning with disseminating assessment plans to parents, engaging all students in an efficient assessment at the beginning of kindergarten, and then progressing from a more general to specific plan based on the needs of each student.

Comprehensive Team with Established Roles. Clearly articulated roles and responsibilities within a team emerged as an essential component of moving from skill-based assessments to those that identify risk of dyslexia or difficulty with reading acquisition. Mrs. Bennett described a possible scenario as paraphrased here: If I've identified student needs based on the PALS, I wouldn't mind doing something like the KTEA-3. However, I'd like someone with more experience to come do some together and work together on interpreting it. Then we can bring in parents or vice-principal and communicate the results. Such a plan asserts the need for a clear funnel between initial assessment, and more detailed assessments with collaboration and communication between parents and service providers as key aspects of the plan.

Build a Child's Learning Profile. The importance of ongoing conversations within a comprehensive literacy program connected to a greater purpose of creating a meaningful learning profile for each child. Mrs. Bennett iterated how the focus of assessment affects the conversations had within faculty and between teachers and parents. Mrs. Bennett described the need to, "Change the conversation from acceptance and nonacceptance for kindergarten enrollment, but to instead start building a child's learning

profile, so from the get-go we can start meeting their needs." An emphasis on attending to differentiation needs early in kindergarten is supported in the research (Simmons et al., 2015) with efforts around both acceleration and intervention proving successful.

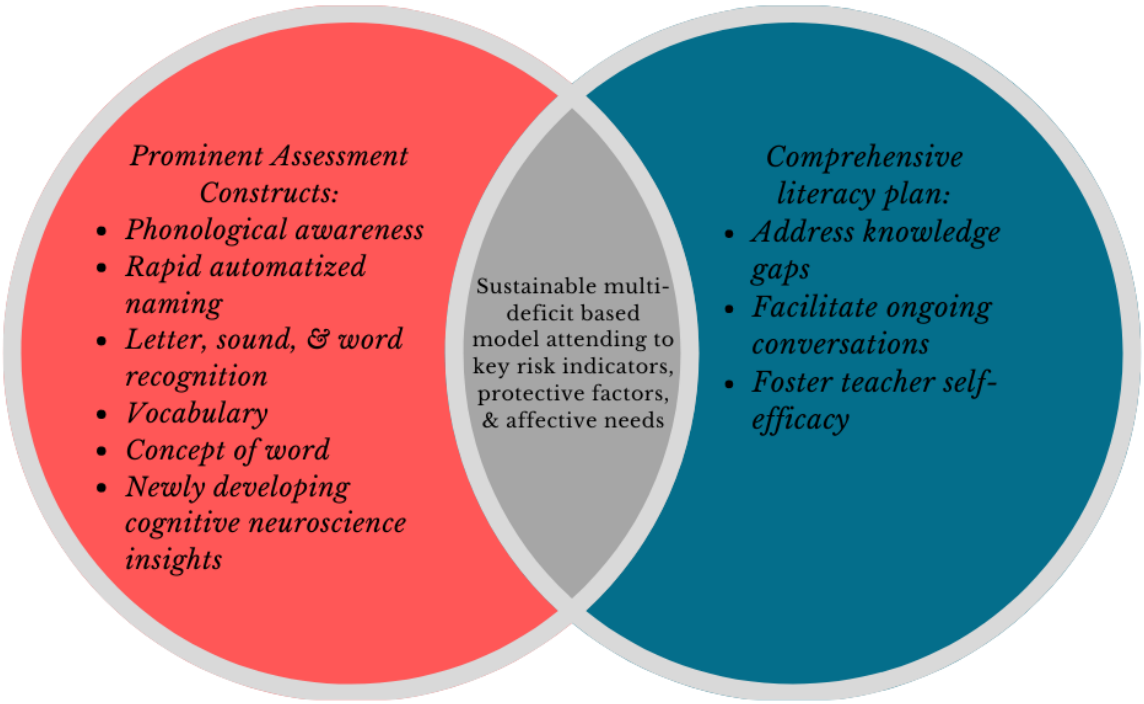
Integration

Research Question 3: How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

Qualitative assessment data pointed to the importance of connecting screener constructs with classroom instruction (Figure 6). Multiple cognitive deficit theory addresses the need to include letter naming facility subtests and measures of phonemic awareness within a screening battery. The correlation between the letter naming facility subtest and total dyslexia score supports multiple deficit model. Affective dimensions of implementing and communicating screening assessments proved critical to creating a sustainable assessment funnel in kindergarten. Attention to both quantitative and qualitative domains are essential in a comprehensive literacy plan.

Figure 6

Assessment Constructs and Affective Domains of Screening



Summary

In this chapter, the quantitative and qualitative research methods and resulting data was explained to answer the following research questions:

RQ1: What is the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener?

RQ2: What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multi-tiered system of supports for reading instruction in an inclusive kindergarten setting?

RQ3: How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

The researcher described the instruments applied and the analyses conducted as a result of the administration of the PALS and KTEA-3 assessments as well as the semi-structured teacher interview. Statistical quantitative results as well as themes that emerged from the qualitative analysis were presented. Quantitative analysis revealed significant correlations between constructs, thereby rejecting the null hypothesis in question 1. The largest correlation within the KTEA-3 occurred between the dyslexia index and letter naming facility. Due to the significant correlation between the KTEA-3 total dyslexia index score and the PALS letter name construct as well as the KTEA-3 letter & word subtest with three PALS subtests (letter name, concept of word pointing, and concept of word list), the null hypothesis is rejected and the alternative hypothesis is accepted. A multiple factorial probabilistic model of dyslexia attends to both risk indicators and predictive factors. At a minimum, comprehensive screeners include the following key risk indicators: phonological awareness, rapid automatized naming, letter (sound) knowledge, and vocabulary. The large correlation between the letter naming facility subtest and total index score on the KTEA-3 highlights the importance of this construct that is absent from the PALS screener. Additionally, both screeners are missing an assessment of vocabulary as well other potentially important areas such as socioeconomic status. The significance of the correlation between constructs as well as the lack of data on important areas is discussed in the following chapter.

CHAPTER 5: DISCUSSION

Kindergarten to first grade is a dynamic period of heightened brain plasticity in children (Sanfilippo et al., 2019). When educators have the tools to capitalize on this window of amplified brain growth, upwards of 56% to 92% of students receiving early reading intervention achieve average reading ability (Torgesen, 2004). Historically, educational systems have been challenged with incorporating research supporting early intervention, instead relying on an ineffective discrepancy model in education (Sanfilippo et al., 2019). Achievement gaps, especially for students coming from homes with a low socioeconomic status and those with learning disabilities, as well as poor overall performance in grade four reading assessments continue to persist (Gilmour et al., 2019; Vaughn & Wanzeb, 2014).

More recent policies are designed to specifically address the lack of access to early intervention addressing the achievement gap. Policy shifts including the more recent Every Student Succeeds Act (ESSA) move accountability to local education agencies and encourages evidence and place-based intervention by local educators ("Every Student Succeeds Act," 2017). Within a multi-tiered system of supports, ESSA aims to implement systemic practices supportive of a rapid response to students needs alongside data-based instructional decision making (Mandlawitz, 2016). Even though assessing pre-literacy skills predictive of long-term reading outcomes is necessary in moving to a preventative support model (Gaab, 2019), a roadmap for connecting effective screening measures to differentiative instruction in foundation literacy skills to support mastery for all students has yet to be established (Jones et al., 2015). There is a need for a community based support model of instruction connecting cognitive neuroscience, "early

screenings, and evidence-based responses to screenings through empowered well trained teachers within a general education framework" (Sanfilippo et al., 2019, p. 15).

Revisiting the Purpose of the Study

As called for in previous research, the purpose of this study is to support the translation of empirical findings around the science of reading to an efficacy study in an authentic classroom setting (Solari et al., 2020). The present study sought to explore the relationship between constructs on kindergarten literacy screeners and the teacher's perceptions of using the KTEA-3 and PALS screeners to create a multitiered system of supports for reading instruction. Additionally, this study addressed the convergence of the data influences on the practical implementation of reading screeners in kindergarten.

This study is grounded in cognitive behavioral research supporting a more recently introduced probabilistic multifactorial model for dyslexia (Pennington, 2006). Initially proposed by Pennington in 2006, such a multiple cognitive deficit model of dyslexia is seen as an extension to the previously emphasized dual coding theory of dyslexia. Follow-up research further supported the notion of a multifactorial model for dyslexia as multiple predictors were found to make additive contributions to predicting dyslexia (Pennington et al., 2012). The probabilistic multifactorial model for dyslexia addresses risk indicators connected to preliteracy skills including family history and socio-economic status as well as the dynamic interplay between genetic, neural, cognitive, and environmental risk and protective factors influencing literacy achievement (Ozernov-Palchik et al., 2016).

The explanatory sequential mixed methods design was employed to answer the research questions. Quantitative data collection resulted from scores on the PALS and

KTEA-3 screeners for kindergarten students (n =16) from a Western suburban parochial school. Qualitative findings developed from a semi-structured interview with the classroom teacher. The following chapter will summarize the quantitative results and qualitative findings followed by a contextualized discussion of both. Quantitative results will include explanations of the significance between correlations while also noting missing constructs. Qualitative findings will be discussed in relation to the patterns that emerged during the six-step coding process. The convergence of the outcome quantitative instrument data and the qualitative data will be then be discussed with all summaries of results discussed in relation to research. Lastly, this chapter will discuss the significance of the study; limitations of the study; recommendations for future research; and recommendations for practice.

Summary of Quantitative Results

RQ1: What is the relationship between the constructs in the KTEA-3 dyslexia screener and the PALS reading screener?

The aim of the quantitative portion of the current study was to investigate the relationship between constructs on the KTEA-3 and PALS literacy screeners with students within a kindergarten classroom setting. To reach this goal, descriptive statistics were used to identify significant correlations between subtests on the two measures. A Pearson r correlation coefficient revealed statistically significant correlations ranging from r = .499 - .894 (p .000 - <.05). Therefore, the null hypothesis was rejected and the alternate hypothesis accepted.

Correlations of importance occurred within and between screening measures. On the KTEA-3 assessment, all three subtests (phonological processing, letter & word

recognition, and letter naming facility) all significantly correlated with the total dyslexia index at the p =.01-.05 level. Of particular interest is the largest correlation between the letter naming facility and total dyslexia index score with r = .894 (p = .000). The letter naming facility subtest is a measure of rapid automatized naming, a measure not currently included in the PALS assessment. Two of the four students identified as having moderate, elevated, or low (compared to very low) risk of dyslexia had letter naming facility scores in the high-risk category. One student's score fell in the moderate risk category under phonological process, and another student's moderate risk score was on the letter & word recognition subtest. Interestingly, the one student with increased risk noted on the phonological processing (standard score of 80 = moderate risk) and letter naming facility (standard score of 73 = high risk) subtests had an overall total dyslexia score of 91, due to a standard score of 132 on the letter and word recognition subtest. The total combination of scores placed this student in the range of having an overall low risk of dyslexia. Correlation analysis on this assessment may demonstrate each construct as being uniquely related to dyslexia.

The variance of correlations was greater on the PALS assessment than the KTEA-3 assessment with levels varying from weak to strong. Letter sound and spelling had the highest correlation on the PALS with r = .764. Spelling is not a measure included on the KTEA-3 assessment. Within the PALS measure, concept of word pointing (the ability to engage in voice to print matching by pointing at a memorize script of words) was connected to the other two strong correlations. The correlation between concept of word pointing was r = .750 (p =.001) with spelling and r =.715 (p =.002) with letter sound. All other significant correlations were moderate.

Concept of word domain remained a significant factor when analyzing correlations between screeners. The strongest correlation between the KTEA-3 and PALS assessments was moderate. A correlation of r =.694 (p= .003) was found between the PALS concept of word list (reading a list of words previously read as part of a memorized book with pictures) and the KTEA-3 letter word recognition subtest. Additionally, the letter & word recognition subtests garnered the most significant correlations with the PALS subtest. Of additional significance is the notable lack of correlation between the phonological processing and letter naming facility subtest on the KTEA-3 measure with any of the PALS subtests. Furthermore, it is also worthy to note the discrepancy between students identified as "at-risk" for dyslexia on the KTEA-3 assessment and identified as needing additional support on the PALS screener. All students met benchmark on the PALS screener, leaving no students identified as needing interventive supports. Whereas the KTEA-3 identified one student with having a moderate risk for dyslexia, one with an elevated, risk, and two at low risk, suggesting two to four students may need supplemental instruction or further attention.

Quantitative Results in Relation to Research

Unique RAN Variance. All subtests on the KTEA-3 assessment demonstrated significant correlations and the highest correlation between subtest on the KTEA-3 assessment was found between the letter naming facility subtest and the total dyslexia score. This finding aligns with previous research (Zuk et al., 2019) which indicated rapid automatized naming skills, in addition to letter sound knowledge and phonological awareness, is a key predictor of later literacy outcomes. Additionally, these results support the identification of rapid naming as having its own unique brain region

supporting this process (Ozernov-Palchik et al., 2017). As stated previously, children identified as having a low, moderate, or elevated risk for dyslexia on the KTEA-3 showed different subtypes of reading difficulties. This finding supports the work (Ozernov-Palchik et al., 2017) around implications for dyslexia risk subtypes. Additionally, these findings bolster calls for giving careful consideration to child by instructional models of prevention (Gaab, 2019) and intervention based on a holistic profile of a student's relative strengths and weaknesses (Zuk et al., 2019).

Key Constructs. Often hidden within the realm of phonological awareness, concept of word is often a subskill omitted from screening measures (Flanigan, 2007) such as the KTEA-3. Results correlating components of the concept of word assessment with the KTEA-3 measure support the importance of concept of word within kindergarten screening measures (Morris et al., 2003) as o ther subtests may not demonstrate predictive validity at each assessment window.

Missing Constructs. As identified within a multifactorial probability model of dyslexia, risk and protective factors at the genetic, brain, cognitive, and environmental levels influence the likelihood of developing reading difficulties. While phonological awareness, rapid automatized naming, and letter, sound, and word knowledge are known as strong predictors of later literacy achievement, verbal working memory and vocabulary are other important areas to consider. Verbal short-term memory (VSTM), the storage and active processing of current information, has been connected with familial risk for dyslexia as well as actual reading performance. Specifically, "VTSM, short-term memory for linguistic (verbal) material (e.g., a string of letters), is sometimes subsumed under PA, since both involve phonological processing, but there is evidence that it

represents a distinct construct" (Ozernov-Palchik et al., 2017, p. 3). Additionally, vocabulary is positively linked with higher SES and reading development (Zuk et al., 2019). Previous research (Ozernov-Palchik et al., 2017) identified students with low socioeconomic status as being over represented in a group of students with a reading profile showing a weakness in either phonological awareness or rapid automatized naming. Reading intervention in early elementary grades has been shown to increase cortical growth and be especially beneficial for children displaying reading difficulties who come from lower SES homes (Romeo et al., 2018). Both the KTEA-3 and PALS are missing key constructs related to reading screeners and may be better used as part of a compendium of assessments. A void in cognitive, heritable, and environmental constructs as part of a kindergarten reading screening may lead to a misallocation of instructional resources. Identifying who is truly at-risk is necessary to support better allocation of resources (Zuk et al., 2019).

Qualitative Results in Relation to Research

RQ2: What are the teacher's perceptions of using the PALS and KTEA-3 screeners to create a multitiered system of supports for reading instruction in an inclusive kindergarten setting?

Knowledge Gaps

The teacher reported experience with an assessment tool and related professional development around the phases of reading development to be critical factors for implementing and sustaining a comprehensive screening program within a MTSS framework. Both tests require 15-20 minutes to administer. However, the flexibility with some small group portions of the PALS assessment versus the individual assessment of

the KTEA-3 assessment affected the logistics of administration. Mrs. Bennett attributed more positive feelings to the PALS universal screening assessment she administered and associated feelings of unease with the KTEA-3 dyslexia assessment that she did not administer. This experience supports the previously documented challenges in research revealing the classroom teacher has little to do with administering screening tools used to identify student's risk for reading difficulties (*Congressional Documents and Publications*, 2015). Additionally, research around the gradual release of responsibility (McVee et al, 2018) in teacher professional development as well as the need for mastery moments (Tschannen-Moran & Hoy, 2007) addresses this teacher's lack of comfort with the KTEA-3 assessment tool and topic of dyslexia. Commensurate with best practices in research, the teacher emphasized a need for professional development to translate to the classroom teacher by informing teachers about how to differentiate instruction based on stages of reading development (Ehri, 2005). Expert teaching is characterized by informed flexibility (Kracl, 2012). Mrs. Bennett communicated the desire to engage with the assessment instruments in a way that fosters her ability to understand a student's current level of performance in comparison to expected levels and feel equipped to take action to close the gap (Hattie & Clark, 2019).

Ongoing Conversation

Gaps in knowledge are not only present within the classroom, but also within the parent community as parents develop their understanding of the role screening measures play at the onset of formal education. Clearly articulating the purpose and importance of literacy screenings and commensurate instruction with parents was identified by this teacher as a critical component of creating a comprehensive literacy plan. Mrs. Bennett's

sentiments tap into a dearth in education research around best practices in communicating with parents regarding dyslexia and literacy screenings. This connects to previous research identifying a misunderstanding regarding the purpose of early screening measures as meant to diagnose rather than identify risk profiles as a reason parents and teachers have been resistant to implementing screening programs (Gaab, 2019). Many states have developed comprehensive dyslexia handbooks (*Dyslexia Handbook*, 2018), but the handbooks fail to address effective means by which educators communicate with parents prior to a screening for dyslexia in a way that clearly articulates a purpose, builds trust and rapport, and fosters open communication.

Fostering Self-Efficacy

Creating an ongoing conversation around literacy screening and related instructional support is important, and it requires a teacher to have a high sense of self-efficacy in enacting the agreed upon program. Participating in the assessment screening was a factor identified by this teacher as considerably impacting the positive and negative emotions connected with a screening measure. Self-efficacy can be interpreted as the belief in one's ability to enact the changes they seek to be made (Hattie, 2012). Mastery moments promote self-efficacy (Bandura & Schunk, 1981). This teacher's perceptions are commensurate with previous research around professional development as being most effective when mastery experiences are supported through follow-up coaching (Tschannen-Moran & Hoy, 2007).

The practicality of an assessment tool emerged as another important factor. An emphasis on efficient assessment and input is another facet of screening measures that substantiates recommendations by leading cognitive neuroscientist Nadine Gaab. Gaab

describes effective measures as following the acronym SCREENED: short, comprehensive, resourceful, early, and inclusive of ESL/dialect (Gaab, 2017). Another important factor in creating self-efficacy is understanding the correlation between assessment, standards, and curriculum. The teacher's desire for assessments to be directly related to instruction is commensurate with previous research, such as that around differentiating instruction with an enhanced alphabet method, documenting the importance of providing teachers with a method for how to differentiate instruction for each student (Jones & Reutzel, 2012). Fostering self-efficacy in teachers is part of creating a comprehensive literacy plan.

Comprehensive Literacy Plan

Mrs. Bennett spoke frequently of moving from more general to specific assessments while building a child's learning profile. This is facilitated through clearly establishing a screening funnel articulated to parents before the onset of assessment, so each stakeholder understands the tiers of support in place for educating children. Such an MTSS framework is mandated in current legislation (*Multi-Tiered System of Supports (MTSS) | CDE*, 2019). Mrs. Bennett envisioned an effective literacy plan as one with the teacher and support providers working in tandem as they interpret successively more involved assessments. Importance placed on a comprehensive team with established roles working to build a child's learning profile validates previous research proving acceleration and intervention efforts successful in kindergarten (Simmons et al., 2015). A comprehensive literacy plan is vital to address knowledge gaps, facilitate ongoing conversations, and foster teacher self-efficacy.

Integration of Results

RQ3: How does the convergence of the outcome quantitative instrument data and the qualitative data influence the use of reading screeners in kindergarten?

The confluence of data and findings made requisite a sustainable multi-deficit-based model of literacy attentive to key risk indicators, protective factors, and affective needs. Kindergarten literacy screeners were identified as effective tools when they were connected with a teacher's ability to administer and decipher the results, and then feel empowered to translate results into practice. Additionally, screening measures varied in their identification of students at risk for reading delays, documenting the need for carefully choosing a comprehensive reading screener. Though only in its pilot phase, the Boston Early Literacy Screener (BELS), otherwise known as EarlyBird is a screener aligned to the needs identified within this study. This screener encourages collaboration between pediatricians, cognitive neuroscientists, and educators. EarlyBird assesses the following six risk indicators: phonological awareness, phonological short-term memory, rapid automatized naming, letter (sound) knowledge, vocabulary, and oral listening comprehension. The screening battery in BELS does not directly assess family history and SES within the app, but it does document those areas as risk indicators within the screening battery. Efficiently administered by a classroom teacher in a small group setting, predictive of general reading risk and developmental dyslexia, and connected to detailed intervention supports for students falling below the 25th percentile, EarlyBird is designed to fit within a RTI/MTSS framework (*Our Solution*, n.d.).

Though the findings of from this study are not generalizable to the greater population, the substantial connection between the quantitative data and qualitative

findings from the current study and the preceding literature are noteworthy. The predictive validity of screening measures, the necessity of teachers participating in screening assessments (*Congressional Documents and Publications*, 2015), and the importance of early prevention and intervention efforts (Simmons et al., 2015) give credence to continued efforts to situate early screening measures within a clearly articulated assessment funnel. This study also supports continued efforts around understanding treatment utility of assessment measures with an emphasis of connecting measures to improved reading outcomes.

Significance of the Study

The current study supports and expands upon the extant literature in the field of early literacy screening. Though legally required in many states, the effective implementation of screening measures as part of a sustainable multi-tiered system of supports remains a work in progress. This study elucidates key factors involved in creating effective kindergarten literacy programs. Additionally, this study highlights missing pieces of many screening measures frequently used by schools, documenting the potential for over and under identifying students in need and misallocating resources. Further, this study brings to light application of a multifactorial probabilistic model of dyslexia (reading disability). Expounding upon a multifactorial probabilistic model calls attention to both the risk and protective factors associated with reading difficulties and achievement. Addressing genetic, brain, cognitive, and environmental factors such as socioeconomic status, heritability, home literacy, and teaching efficiency to the forefront of the conversation around dyslexia promotes a dialogue away from a quick glance at a

few scores and towards a more robust ongoing conversation seeking to harness each child's learning potential.

This study also situates screening measures within a compendium of assessments aligned to a MTSS framework designed around a multifactorial probabilistic model of dyslexia. A variety of assessments including direct assessments predictive of later reading success, criterion-based assessments, and observational assessments are needed to create a holistic learning profile for each child. Such a consortium of assessments offer both cut score reference points to foster arrangement for services as well as monitoring progress in individual domains and making instructional decisions accordingly (National Research Council, 2008). Kindergarten screening measures are one piece of a carefully designed framework of direct and observational assessments sensitive to the individual backgrounds and learning needs of each child.

Limitations

The proposed study has a number of limitations that require consideration when interpreting the findings. Firstly, the students and teacher selected for this study were from a convenience sample in a suburban Catholic elementary school; their similar backgrounds limits the generalizability of results. Secondly, only one teacher participated in the semi-structured interview, significantly limiting the generalizability of qualitative results. Additionally, there was little representation of minority students, English language learners, and students with identified special education needs. Further, no students were on free and reduced lunch and there was not a distinction made between students coming from homes with varying SES. The external validity is further limited as results can only be applied to the outcome measures of phonological processing, letter

naming facility, and letter & word recognition and does not consider vocabulary, comprehension, or oral language. Follow-up experiments across settings will be needed.

While some may be mediated, threats to internal validity remain. After the onset of the study, the state suspended in person instruction due to the 2020 Coronavirus pandemic. The teacher interview occurred remotely during the pandemic. Though pre-test measures occurred in person during the time preceding the school closure, the influence of unprecedented outside stressors may have impacted results. The researcher's role in selecting, administering, and analyzing results may have impacted objectivity during the analysis.

Delimitation

The research questions were limited to the confines of the current study and do not extend beyond the boundaries of the instruments and perceptions of educators involved in the study.

Recommendations for Future Research

Create a Connection Between Family Literacy and Dyslexia Initiatives

Research studies with designs that bring voices from families and teachers to the forefront are needed. Education around reading development in home and at school along with specific terminology, creating an ongoing conversation around each child's learning profile will serve in advancing literacy growth. For instance, research may address the effectiveness of explicitly introducing foundational literacy skills to parents through interactive means such as approved videos with voice-overs along with an invitation to create community via a class collection of videos and images of reading at home or in the community. Another opportunity for research incorporates teachers offering a family

engagement connection with a specific activity incrementally throughout the year to build parent's sense of efficacy in serving as their child's first teacher of literacy. Such research provides the opportunity to identify effectiveness of specific approaches to enriching student's literacy opportunities.

Research connecting family literacy and dyslexia initiatives focus on a means by which teachers and families feel empowered to create a successful literacy plan for each child. Surveying parent responses to visually mapping the assessment funnel and instructional system of supports provides an opening to cognize communication supportive of parent understanding. Additionally, research addressing the screening assessments and the effectiveness of parent participation within the literacy planning process reinforces utilizing a clearly articulated process to gain such parent involvement. Lastly, research around student growth and teachers and parent perceptions affords the education community with an understanding of the academic and affective factors impacting sustainability of literacy programs.

Connect to Affective Domains of Literacy

Motivation and self-efficacy garner less coverage in terms of kindergarten screening assessments. However, motivation and self-efficacy are important to consider as additional exacerbating and protective factors in acquiring reading skills (Ozernov-Palchik et al., 2016). Teacher's comfort levels with an assessment as well as their perception regarding the efficiency and effectiveness of a measure influence the sustainability of a program. Further research in the affective domains, assessment, instruction, and acquiring foundational reading skills is warranted.

Continue the Research Around Multifactorial Models of Dyslexia and MTSS

A multifactorial probabilistic model of dyslexia expands previous research around single and dual deficit models of dyslexia. A multifactorial model incorporates an understanding of comorbidity between conditions such as attention deficit hyperactivity disorder and dyslexia (Pennington, 2006). Additionally, a multifactorial approach emphasizes varying levels of risk factors, including environmental factors such as SES. Even more, a multifactorial approach shifts the narrative from solely deficit based to identifying both risk and protective factors. Further research on the practical application of a multifactorial model of reading risk and developmental dyslexia will bridge the research on assessment and instruction, providing a clearer road map for teachers and practitioners.

Recommendations for Practice

Move to a Multifactorial Probabilistic Preventative Approach to Literacy Instruction

Include RAN and Other Often Omitted Subtests. Screening tools are changing and developing rapidly. For instance, the PALS screener is currently in the process of being updated to include a rapid automatized naming (RAN) component. It is important for educators to stay abreast of research across education and cognitive neuroscience settings, so they are able to create a compendium of assessments that meets the needs of their unique set of students. Formal assessments such as the BELS/EarlyBird assessment offer much promise. Informal, formative assessments may be another necessary component of a screening funnel. For instance, concept of word is something that can be assessed informally at the beginning of kindergarten and then addressed immediately

through small group interactive writing and shared dialogic readings. Education systems must acknowledge gaps in their assessment protocol while also forging ahead with the tools available to them. Increasingly improved technology including digital platforms and apps may play an increasingly important role as educators, families, and health practitioners increase the efficiency of identifying and addressing each child's unique literacy needs. There is no one-size-fits-all assessment for each school. Instead, a comprehensive literacy plan must include a streamlined assessment funnel that both identifies risk and provides preventive instruction.

Acknowledge and Address the Impact of SES on Literacy. SES is highly correlated with reading achievement; 80% of fourth grade students from low SES backgrounds read below grade level (*NAEP Reading: National Achievement-Level Results*, n.d.). Factors related to low SES such as fewer books at home and less shared reading (Ozernov-Palchik et al., 2016) impact a student's risk for developing dyslexia. Additionally, concept of word plays a linchpin role in developing the more sophisticated form of phonological awareness needed for reading (Flanigan, 2007). Dialogic reading serves to play a potentially important role in developing both concept of word and the reading skills in students coming from homes with lower SES status. For example, engaging in dialogic reading fosters language skills related to developing vocabulary and voice to print matching connected to developing phonemic awareness skills. (Gately, 2004). Including SES and concept of word in a kindergarten reading screening offers educators an opportunity to more carefully match instruction to a student's needs and provide efficient, effective classroom based instructional supports.

Create a Comprehensive Literacy Plan. Schools may wish to engage in comprehensive backwards mapping to ensure a clearly articulated goal of literacy for all and coordinated steps for achieving the goal. Parent communication in advance of screening is an imperative component of a comprehensive plan. Another suggested practice is engaging in culturally responsive pedagogy (Ladson-Billings, 1995) embracing family literacy as an asset to instructional planning and harnessing those rich resources to augment school programming. Additionally, it is recommended to include a robust assessment funnel that engages formal and informal assessments aligned to informed instructional practices coordinated with ongoing professional development. Such a funnel explicates roles, responsibilities, and communication streams within the school and between the school, families, and community. Schools shall also consider teacher self-efficacy surveys and self-assessment as well as student reading attitude surveys in an effort to connect the affective and academic domains of literacy. Continually, an emphasis on inclusive practices rooted in evidenced based instruction, such as enhanced alphabet instruction, connected to assessment results is encouraged. Overall, it is recommended to establish a comprehensive plan attending to the needs of students, parents, and educators in an efficient and effective way.

Conclusion

Findings from this current study grounded in a multifactorial probabilistic view of dyslexia corroborate the extant research identifying multiple risk and protective factors aligning to distinct dyslexia subtypes. Combined, the results from the quantitative PALS and KTEA-3 coupled with the qualitative interview created an understanding of the essential constructs in a reading screener and related elements necessary for sustainable

implementation within an inclusive kindergarten setting. Creating a comprehensive assessment plan inclusive of screeners that address critical subskills of early literacy, including phonological awareness, phonological short-term memory, rapid automatized naming, letter sound knowledge, vocabulary, and oral listening comprehension are one critical step to creating an early intervention program. Additionally, thoughtful ongoing conversations with parents delineating the power and promise of early literacy screenings and related instructional supports along with considering impacts of family history and socioeconomic status are essential components of an elementary literacy plan. In conjunction, professional development around early literacy and ongoing collaboration between education professionals further supports a successful preventive approach to education. Combined, literacy screeners as part of a clearly articulated assessment funnel, ongoing conversations with families, and established roles and responsibilities of a team of education (and possibly medical) professionals offer promise to reducing the achievement gap and ensuring literacy achievement for all students, regardless of background.

APPENDICES

Appendix A: Contact Letter

Principal Consent Form

Dear Principal:

Your school has been selected to be used as a site to conduct a research study to learn more about the effect of enhanced alphabetic instruction and using bookmarks to monitor progress as a means to increase literacy skills. This study will be conducted by Susan Schatz, Department of Education Specialties, St. John's University, as part of her doctoral dissertation work. Her faculty sponsor is Dr. Evan Ortlieb, Department of Education Specialties.

If you agree to allow your school and students to participate in this study, the researcher may ask to gain access to student files and records and/or test scores. The participating kindergarten students will be given small group instruction in alphabetics within the classroom reading block unless you choose to opt out of this participatory project. Some students will receive a bookmark to monitor their progress in learning letter and sound patterns. The study is anticipated to be ten to twelve sessions lasting ten to fifteen minutes per session. Photographs of student work (not the students) will be taken during the study. There are no known risks associated with your site participating in this research beyond those of everyday life.

Federal regulations require that all subjects be informed of the availability of medical treatment or financial compensation in the event of physical injury resulting from participation in the research. St. John's University cannot provide either medical treatment or financial compensation for any physical injury resulting from your participation in this research project. Inquiries regarding this policy may be made to the principal investigator or, alternatively, the Human Subjects Review Board (718-990-1440).

The students may benefit educationally from receiving this instruction. This research may help the investigator understand the effects of the enhanced alphabetic instruction and bookmarks for progress monitoring and may help to increase this option for teaching literacy to your students.

Confidentiality of your student's records will be strictly maintained by removing names and any identifiers will be replaced with a pseudonym. Consent forms will be stored in a separate location from the interview documentation and will be stored in a locked file. All information will be kept confidential with the following exception: the

researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others.

Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. For student documents or academic records, you may refuse access to the researcher. Nonparticipation or withdrawal will not affect your grades or academic standing.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Susan Schatz, schatzs1@stjohns.edu, St. John's University 8000 Utopia Parkway, Queens NY, 11439 or the faculty sponsor, Dr. Evan Ortlieb, at ortliebe@stjohns.edu, St. John's University, 8000 Utopia Parkway, Queens NY, 11439.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

You have received a copy of this consent document to keep.

Agreement to Participate

Yes, I agree to have my school participate in the study described above.

_____ _____

Principal's Signature Date

Yes, I agree to allow the researcher permission to photograph student work related to this study.

_____ _____

Principal's Signature Date

Appendix B: Teacher Consent Form

Teacher Consent Form

Dear Participant:

You have been invited to take part in a research study to learn more about the effect of enhanced alphabetic instruction and using bookmarks to monitor progress as a means to increase literacy skills. This study will be conducted by Susan Schatz, Department of Education Specialties, St. John's University, as part of her doctoral dissertation work. Her faculty sponsor is Dr. Evan Ortlieb, Department of Education Specialties.

If you agree to be in this study, you will be asked to do the following: Complete a 45 minute online course on enhanced alphabet instruction, take part in two interviews to help the researcher understand your perception of the affordances and challenges of enhanced alphabetics instruction and student progress monitoring, engage students in ten to twelve enhanced alphabetic instruction sessions. Some students will receive a bookmark to monitor their progress in learning letter and sound patterns. The study is anticipated to be ten to twelve sessions lasting ten to fifteen minutes per session. Photographs of student work (not the students) will be taken during the study. There are no known risks associated with your site participating in this research beyond those of everyday life.

Federal regulations require that all subjects be informed of the availability of medical treatment or financial compensation in the event of physical injury resulting from participation in the research. St. John's University cannot provide either medical treatment or financial compensation for any physical injury resulting from your participation in this research project. Inquiries regarding this policy may be made to the principal investigator or, alternatively, the Human Subjects Review Board (718-990-1440).

The student may benefit educationally from receiving this instruction. This research may help the investigator understand the effects of the enhanced alphabetic instruction and bookmarks for progress monitoring and may help to increase this option for teaching literacy to your students.

Confidentiality of your student's records will be maintained by removing his/her name and any identifiers will be replaced with a pseudonym. Consent forms will be stored in a separate location from the interview documentation and will be stored in a locked file. Your responses will be kept confidential with the following exception: the researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others. Your responses will be kept confidential by the researcher, but the researcher cannot guarantee that others in the group will do the same.

Participation in this study is voluntary. You may refuse to participate or withdraw your child at any time without penalty. Nonparticipation or withdrawal will not affect your child's grades or academic standing.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Susan Schatz, schatzs1@stjohns.edu, St. John's University 8000 Utopia Parkway, Queens NY, 11439 or the faculty sponsor, Dr. Evan Ortlieb, at ortliebe@stjohns.edu, St. John's University, 8000 Utopia Parkway, Queens NY, 11439.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

You have received a copy of this consent document to keep.

Agreement to Participate

Yes, I agree to participate in the study described above.

_____ _____

Participant's Signature Date

Appendix C: Participant Consent Form

Participant Permission Form

Dear Parent of Participant:

Your son/daughter has been selected to participate in a study to learn more about the effect of enhanced alphabetic instruction and using bookmarks to monitor progress as a means to increase literacy skills. This study will be conducted by Susan Schatz, Department of Education Specialties, St. John's University, as part of her doctoral dissertation work. Her faculty sponsor is Dr. Evan Ortlieb, Department of Education Specialties.

Your child will be given small group instruction in alphabetics within the classroom reading block unless you choose to opt out of this participatory project. Some students will receive a bookmark to monitor their progress in learning letter and sound patterns. The study is anticipated to be ten to twelve sessions lasting ten to fifteen minutes per session. Photographs of student work (not the students) will be taken during the study. There are no known risks associated with your site participating in this research beyond those of everyday life.

Federal regulations require that all subjects be informed of the availability of medical treatment or financial compensation in the event of physical injury resulting from participation in the research. St. John's University cannot provide either medical treatment or financial compensation for any physical injury resulting from your participation in this research project. Inquiries regarding this policy may be made to the principal investigator or, alternatively, the Human Subjects Review Board (718-990-1440).

The student may benefit educationally from receiving this instruction. This research may help the investigator understand the effects of the enhanced alphabetic instruction and bookmarks for progress monitoring and may help to increase this option for teaching literacy to your students.

Confidentiality of your child's records will be maintained by removing his/her name and any identifiers will be replaced with a pseudonym. Consent forms will be stored in a separate location from the interview documentation and will be stored in a locked file. Your responses will be kept confidential with the following exception: the researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others. Your responses will be kept confidential by the researcher, but the researcher cannot guarantee that others in the group will do the same.

Participation in this study is voluntary. You may refuse to participate or withdraw your child at any time without penalty. Nonparticipation or withdrawal will not affect your child's grades or academic standing.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Susan Schatz, schatzs1@stjohns.edu, St. John's University 8000 Utopia Parkway, Queens NY, 11439 or the faculty sponsor, Dr. Evan Ortlieb, at ortliebe@stjohns.edu, St. John's University, 8000 Utopia Parkway, Queens NY, 11439.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

You have received a copy of this consent document to keep. All kindergarten students will be included in the study unless parents wish their student not participate. If you do agree to have your child participate in the study, no further action is necessary. If you would not like your student to participate, return this form to your child's teacher by February 28, 2020.

Opt-Out Participation Form

No, I do not agree to have my **son/daughter** participate in the study described above.

_____

Child's Name

_____ _____

Parent's Signature Date

Appendix D: Interview Questions

Questions for semi-structured teacher interviews

General Perceptions

1. What is your perception of using the PALS assessment to create a multitiered system of supports for reading instruction in your classroom?
2. What is your perception of using the KTEA-3 assessment to create a multitiered system of supports for reading instruction in your classroom?

Self-efficacy

1. How would you describe your sense of self-efficacy as it pertains to providing high impact differentiated instruction in foundational literacy skills including alphabetics, phonological awareness, concept of word, and phonemic awareness?
2. How would you describe your understanding of dyslexia?
3. How would you describe the ease or challenge with which you interpret the results from the assessments?

Feasibility

1. How practical is the timing of administering these assessments?
2. Are there constructs of the screeners that are the most helpful to planning instruction connected to a multitiered system of supports? If so, which constructs and in what way?
3. Are their constructs of the screeners that do not seem to be helpful in planning instruction connected to a multitiered system of supports? If so, which constructs and why?

Sustainability

1. What aspects of the PALS and KTEA-3 screeners impact the sustainability of such assessment practices within a kindergarten classroom setting?
2. What are components of screeners you consider important to increased sustainability of use?

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