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Elementary School Teacher's Perception of Occupational Therapy

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Abstract

Low literacy levels in childhood cause detrimental, lifelong effects. Intervention services provided to struggling readers are currently limited.

A preliminary study was conducted following a mixed methods approach to explore teacher perception of the benefits of occupational therapy intervention in the Response to Intervention model for reading delays.

Research questions were as follows:

1. To the teacher's knowledge, are occupational therapy services currently available to students in the Response to Intervention model?
2. Do teachers perceive occupational therapy intervention within the Response to Intervention model beneficial for reading delays?

Data was collected via an electronic survey. Sixty-seven participant responses were analyzed using descriptive statistics. Results suggest a general lack of knowledge and familiarity with occupational therapy services available and the benefits of occupational therapy interventions. However, regardless of the lack of familiarity with occupational therapy services, participant responses indicate a positive perception of the benefits of occupational therapy as an intervention for reading delays within the Response to Intervention model.

Keywords: Occupational therapy, interventions, Response to Intervention model, reading delays, handwriting delays, elementary school teachers, IEPs

Introduction

Literacy is the foundation of academic achievement. If an individual struggle to read or comprehend written material, potential for academic success is greatly hindered (Hernandez, 2011). Children are introduced to literacy at a young age. Story time reading, rhymes, and picture books all promote childhood development of literacy. Children begin to formally learn foundational skills for reading in pre-school and kindergarten. A multitude of factors effect and influence a child's ability to read, such as socioeconomic status, parental involvement, developmental delays, behavioral problems, teaching styles, and academic success (Bellocchi, 2017; Hernandez, 2011; Lopez-Justicia, 2001; Rootman, 2005).

When a child fails to read at an academically appropriate level by the end of elementary school, they are significantly more likely to fall, and remain behind, their peers, are at an increased risk for behavioral problems, more likely to not graduate high school on time, and less likely to get higher paying jobs (Grimm, 2008). A large portion of a child's future is determined by the time they are nine or ten years old (Chard, 2008). However, children are most often not referred to additional intervention services for reading until it is too late (Grimm, 2008). Children who fall behind in reading experience delays in mathematics, science, and general academic skills as a result (Grimm, 2008).

In addition to a gap in the literature regarding occupational therapy services for reading delays, there is limited information regarding occupational therapy services within the RTI model. The RTI model focuses on identifying and providing services to struggling students at the earliest stage (Mesmer, 2008). Currently there is limited information regarding the role of occupational therapy services in this model. However, the few studies conducted suggest occupational therapy services are beneficial when included and would be even more beneficial if

regularly included in the process (Cahill, 2014). Additional research regarding occupational therapy services within the traditional school setting and within the RTI model, specifically with regards to reading delays, will further advance the practice and promote additional interventions for students to reduce low levels of literacy and promote grade level reading.

Literature Review

Reading Achievement in Children and Long-Term Impact on Literacy Levels and Health Outcomes

Reading improves comprehension, foundational academic skills, vocabulary, fluency, and writing in children (Miller, 2010). Early reading comprehension is significantly related to a greater conceptual understanding and application of mathematics (Grimm, 2008). Children who read well earlier on tend to be more successful in the future and experience greater success in math, history, science, literature, and geography (Grimm, 2008).

In 2017, more than one-third of children in the United States were delayed in language and literacy skills. Delays in language and literacy skills increase the risk for developing long-term reading difficulties (Hunter, 2017). In 2019, Peng estimated 5-10% of school-aged children were at risk for serious reading delays. In addition, Peng determined fall-of-first grade general academic skills, working memory, nonverbal reasoning, and processing skills predicted word reading and comprehension growth (Peng, 2019).

Despite intervention, poor readers read three times less than their stronger reading peers and despite intervention, tend to remain behind for the rest of their academic career (Miller, 2010). Students with poor reading skills are more likely to fall behind in other academic subjects, are at an increased risk for behavioral issues, are more likely to drop out of high school, and tend

to work lower-paying jobs for the duration of their life (Grimm, 2008). Low literacy levels negatively affect the development of self-confidence, motivation to learn, and overall school performance (Grimm, 2008). Ultimately, low literacy levels during early childhood are likely to persist throughout development when not addressed, resulting in life-long literacy and reading delays (Letourneau, 2015).

General literacy skills include the ability to read and listen, numeracy skills, speaking ability, negotiation skills, critical thinking, and judgment (Rootman, 2005). A person is considered adequately literate when he or she has “acquired all the knowledge and skills in reading and writing which enables him to engage effectively in all those activities in which literacy is normally assumed in their culture group” (Rootman 2005, p. S64). Adequate literacy skills are typically achieved with no less than 9 years of formal schooling (Rootman, 2005).

Literacy levels predict health status more accurately than education level, income, and ethnic background (Fleming, 2004; Topitez, 2009). Low literacy levels are strongly associated with poor self-reported health, difficulty understanding and utilizing health material, reduced use of the health care system, increased chronic disease management, and increased smoking rates (Letourneau, 2015). Individuals and families with low literacy levels are at increased risk of harm due to difficulty reading and understanding medications, baby formulas and food labels, and other health-related written material (Rootman, 2005)

People with low literacy levels are often less aware of available and preventative services, less likely to seek care, have higher rates of hospitalizations, and experience increased difficulty using the health-care system (Rootman, 2005). For many, literacy is a means of personal empowerment and control over one's own health. Low literacy levels potentially cause higher stress levels and increased feelings of vulnerability (Rootman, 2005).

Individuals with low literacy levels tend to live in less healthy environments and experience increased difficulty obtaining employment and income security (Rootman, 2005). Indirect effects of low literacy levels include use of available services, negative lifestyle behaviors, lower income, unhealthy work environments, and increased stress levels (Rootman, 2005).

Reading Comprehension: Language, Visual Processing, and Motor Development

Reading comprehension refers to the active construction of meaning as students read text. In order to perform well academically, proficient reading skills are required (Carbell, 2008). General language development during early childhood predicts later literacy development and reading success.

There are a variety of skill sets essential to language development. Foundational knowledge of phonological awareness is required to detect and manipulate individual speech sounds (Bellocchi, 2017). This skill is essential for children to be aware of phonemic segments in spoken words before understanding their relationship with letters or groups of letters. Phonological awareness influences reading acquisition and predicts word-reading development (Bellocchi, 2017).

In order to decode written words, students must exhibit proper visual processing skills. Visual-spatial attention in preschoolers predicts future reading development (Bellocchi, 2017). Children with poor reading skills during the first and second year of school performed worse on visual-search tasks and spatial cueing tasks (Bellocchi, 2017).

Gross motor skills are significantly correlated to reading ability. Fine motor skills in kindergarten, specifically visual motor skills and manual dexterity/hand-eye coordination, predict reading at the end of first grade (Bellocchi, 2017).

Instructional Targets for Reading Development

High-priority instructional targets for preschoolers include print concepts, alphabet knowledge, oral language, emergent writing, and phonological awareness. Print concepts refer to the student's ability to understand and organize different print forms and features. Alphabet knowledge refers to the knowledge of letter names and understanding the correspondence between sounds and words (Cabell, 2008).

Emergent writing skills include the student's ability to understand how print works and the progress from non-directional scribbles to recognizable letters. Phonological awareness begins as a shallow processing set of skills and develops to sensitive individual segmented units of speech (Cabell, 2008).

High-priority instructional targets for kindergarten through third grade include phonemic awareness, phonics, fluency, vocabulary, and comprehension skills (Cabell 2008). Phonemic awareness is the most complex form of phonological awareness and refers to the student's ability to segment, blend, and manipulate the smallest unit of sound. This skill is important for reading and helps the child understand how spoken words are mapped into letters (Cabell, 2008). This skill is particularly important for children at risk of developing reading difficulties (Cabell, 2008).

Additional literacy skills required for proficient reading include rapid automatic naming, writing, and phonological memory. Rapid automatic naming requires students to rapidly name

sequences of letters, numbers, colors, or objects (Handley-Moore, 2015). Writing refers to the ability to write letters and words on request (Handley-Moore, 2015). Phonological memory is the ability to remember orally presented information for a short length of time (Handley-Moore, 2015).

A sound understanding of phonics helps students sound out words rather than recognize them from memory. Phonics is the relationship between sound and letters (National Center for Learning Disabilities [NCLD], 2006). Phonic development is most effective during the earlier school years, kindergarten or first grade, and the knowledge lasts for approximately two years (NCLD, 2006). Ultimately, the goal is for children to sound out words rather than recognizing and memorizing the words. This builds on the ability to understand the systemic relationship between sounds and letters and how they are applied to written language (Cabell, 2008). Fluency refers to the ability to automatically and effortlessly read. Fluency depends on the content of information and level of familiarity with words. Continued practice facilitates automatic, rapid, and effortless word recognition (NCLD, 2006). Fluency develops overtime as the student practices reading, but also develops when students regularly hear a model of fluent reading, such as storybook reading (Cabell, 2008). Although fluency develops through continued practice, children struggling with reading often need additional instruction to develop fluent reading skills (NCLD, 2006). In addition to modeling fluent reading, introducing vocabulary before, during, and after stories boosts vocabulary skills (Cabell, 2008)

Developmental Progression of Skills Necessary for Reading

Literacy development occurs in stages. The preliteracy stage refers to the development of joint attention, nonverbal communication, ability to vocalize needs, perception of speech and language, recognizing and understanding pictures, handling books properly, and appropriate

listening skills (Handley-Moore, 2015). The emergent literacy stage includes the development of first words, conventional language development through gaining attention, making requests, describing items, vocabulary gains, language comprehension, recognition of symbols and print, and beginning to understand the function of print (Handley-Moore, 2015). The early literacy stage includes development of fundamental literacy skills, such as understanding words are made of units of sound, or phonemes, analyzing and playing with language, letter and word recognition, and invented spelling, trying to sound words out and guessing the letters (Handley-Moore, 2015). The conventional literacy stage includes the development of reading and writing skills, such as decoding words, reading out loud, reading and writing fluently, comprehending text, generating text, and spelling (Handley-Moore, 2015).

Although primarily a linguistic task, children need adequate visual-perception skills in order to decode written words. Letter recognition and reading acquisition require proper visual-perceptual skills and visual motor skills (Bellocchi, 2017).

Participation in early literacy activities for infants, toddlers, and young children facilitates school readiness. The American Academy of Pediatrics recommends pediatricians promote early literacy, especially from birth to kindergarten, by encouraging parents to read aloud and engage in shared-reading activities (Handley-Moore, 2015).

Literacy development in early childhood and elementary school shifts from learning to read to developing the skills necessary to read in order to learn, analyze information, and develop opinions (Handley-Moore, 2015). Writing informally helps children learn subject area control and how to use writing to show what they know. During this period, motivation to learn and read greatly determines level of engagement or disengagement with literacy activities (Handley-

Moore, 2015). Textbooks for this age range are typically designed for average to above average readers (Handley-Moore, 2015).

Children with disabilities develop literacy skills differently than neurotypical children. Literacy allows individuals to engage more fully in the community. (Handley-Moore, 2015). Children with disabilities experience less opportunities for literacy rich activities (Handley-Moore, 2015). Literacy instructions for children with severe disabilities ideally includes increased accessibility to literature and instruction to promote increased independence in reading. Evidence-based instructional strategies targeting writing skills promote an increased overall reading comprehension levels (Hanley-Moore, 2015). Occupational therapists can assist children with disabilities to explore reading and writing topics interesting to them (Hanley-Moore, 2015).

Influences, Risk, Factors, and Predictors of Academic Performance

The literature identifies numerous factors influencing academic development and achievement of students. These factors include self-concept, parental involvement, social-emotional influences, academic predictors, and effortful control.

Influence of self-concept. Since the 1950s, researchers have analyzed the impact of self-concept on academic performance. Jersild (1951), Combs (1965), and Rodriquez (1982) defined self-concept as “a set of attitudes that an individual holds about themselves and is comprised of three fundamental elements; identity, self-esteem, and a behavioral component reflecting how self-concept influences and conditions individual behavior.” (Lopez-Justicia, 2001, p. 150). As an adult, self-concept is relatively stable, but develops the most between ages 5-11 (Lopez-Justicia, 2001). For children, self-concept develops based on relationships with significant persons in their environment and positive and negative experiences. Self-concept plays a critical

role in education (Lopez-Justicia, 2001). Children who score lower on self-concept tests typically feel more dependent on their parents, experience worse emotional health than peers, experience greater feelings of failure, feel rejected by peer groups, and feel as though they have fewer friends (Lopez-Justicia, 2001).

Parental influences. Parents and family members largely predict academic and literacy development in children (Hunter, 2017). Parental attitudes significantly influence literacy development. Rootman (2005) discusses the effects of the home environment on academic performance. Students with more stimulating home environments perform better than other students. In 2000, the scores for the Program for International Skills Assessment (PISA) were analyzed and the level of parental involvement greatly impacted student scores. Students whose parents took them to cultural events and encouraged conversations about current events and leisure reading outperformed their peer on the PISA (Rootman, 2005).

Social-emotional influences. Violence and abuse contribute to an individual's learning capacity. According to the National Longitudinal Survey of Children and Youth, students who reported being bullied *sometimes* or *often* scored significantly lower in math and reading scores (Rootman, 2005). Hyperactivity, impulsivity, and poor concentration skills are linked to poor academic performance. Teacher reports of attention problems and classroom behaviors predict academic achievement (Fleming, 2004).

Academic predictors. The first few years of elementary school predict later academic achievement. Juel (1998) calculated the importance of end-of-first grade oral reading fluency performance to account for 77% of the variance of end-of-third grade reading proficiency, suggesting intervention prior to the end-of-first grade produces the most beneficial results

(Chard, 2008). Chard (2008) emphasized the relationship between the prediction of spring-of-first grade passage comprehension and SAT-10 scores at the end of third grade (Chard, 2008).

Effortful control predictors. Effortful control predicted academic success. Effortful control refers to the ability to integrate aspects of inhibition, attention, planning, and shifting focus purposefully to different responses and processes. In one study, Lafavor reported emotional control uniquely predicts mathematical and reading abilities (Lafavor, 2018). Children who experience both academic problems and behavioral issues are at greater risk for school failure compared to students with difficulties in one area (Chard, 2008).

Reading Influences, Risk Factors, and Predictors of Reading at Grade Level

The literature identifies numerous risk factors predicting a child's ability to read at grade level. Education, early childhood development, aging, living and working conditions, personality characteristics, genetics, gender, and culture all influence reading development (Rootman, 2005).

Demographics influences and risk factors. Children from low-income families enter elementary school at an average of 2 years behind their peers for literacy development (Clark, 2005). Parental involvement greatly impacts literacy development. Parents who read to their children at a young age positively influence language growth, emergent literacy, and reading achievement (Letourneau, 2015). Parental involvement supports the development of foundational skills necessary for reading and literacy development. Parental involvement in literacy development is influenced by personal literacy levels, childhood literacy experiences, level of education, employment status, family dynamics, and access to resources (Letourneau, 2015). Studies show when teachers perceive parental involvement in literacy development as low,

teachers are less likely to attempt to establish, maintain, and strengthen home-school connections to facilitate growth (Hunter, 2017; Letourneau, 2015).

Visual motor skills as a predictor. Bellocchi (2017) examined the relationship between visual motor skills and reading abilities. Visual motor skills in kindergarten predicted reading outcomes one year later. The stronger a child's visual motor integration skills, the stronger they read. In addition to visual motor skills, a child's phonological awareness predicts reading outcomes one year later. Students greatly benefit from receiving phonological awareness training prior to learning to read (Bellocchi, 2017; Kjeldsen, 2019). Top predictors of reading difficulties include deficits in alphabetic coding, print-related decoding, and phonological awareness (Chard, 2008).

Letter knowledge as a predictor. Early word, oral language skills, vocabulary, and nonverbal reasoning predict reading comprehension. Letter knowledge predicts growth in word reading (Peng, 2019). General cognitive skills such as working memory and nonverbal reasoning directly and indirectly relate to reading comprehension (Peng, 2019).

Peng (2019) analyzed trajectories and predictors of word reading and reading comprehension development among at-risk youth readers and determined letter knowledge as the sole predictor of growth in reading. Vocabulary and nonverbal reasoning predicted comprehension development, but letter knowledge was a more important index than phonological awareness, vocabulary, and nonverbal reasoning in predicting reading development of at-risk beginner readers.

In addition, Peng (2019) determined vocabulary as more important than letter knowledge and phonological awareness in predicting comprehension development. Domain-specific skills,

like nonverbal reasoning, predicted comprehension growth, but not growth in word reading.

Weak reading skills negatively impact a child's achievement in mathematics, science, and social adjustment, as well as their general enjoyment of leisure reading (Peng, 2019).

Reading at Grade Level

Significant predictors of future word reading skills and general reading comprehension for preschool and kindergarten students include code-related skills, like letter knowledge and phonological awareness (Peng 2019). Kjeldsen (2019) determined if students receive no remedial interventions for poor reading by the end of first grade, they tend to remain behind their peers for the rest of their academic careers. Studies prove strong reading skills in first grade are a unique predictor of print exposure data collected in tenth and eleventh grade (Kjeldsen, 2019). The literature suggests early intervention in phonological awareness promotes reading comprehension through improved metacognition. In addition, the literature shows a significant link between reading and strong reading comprehension (Kjeldsen, 2019).

When a student is unable to read at grade level by the middle of elementary school, they experience deficits and delays for the remainder of both their academic and personal careers. Grimm (2008) found third grade reading comprehension to be a positive significant predictor of change for mathematics, faster changes in problem solving and data interpretation, and general rapid academic change. Duncan and colleagues (2007) found reading and mathematics skills as early as the fall of kindergarten to predict later academic achievement (Grimm 2008).

According to Peng (2019), academically appropriate reading comprehension, word recognition, and oral comprehension skills are most important before fourth grade. Once a

student with impaired reading comprehension reaches fourth grade, they are significantly more likely to experience lifelong deficits (Peng, 2019)

Research has long recognized the importance of mastering reading by the end of third grade. Students who cannot read proficiently by the end of third grade often remain behind their peers, earn poorer grades, and are four times more likely to drop out of high school (Hernandez, 2011). For children who have not mastered basic reading skills by third grade, the rate increases to six times more likely to drop out. Skills required for proficient reading include the ability to integrate and interpret written text, apply their understanding of the information, draw conclusions and make evaluations (Hernandez, 2011). Third grade is a pivotal point in a child's education as they shift from learning to read to beginning to read to learn (Hernandez, 2011).

Children who struggle with reading account for one-third of all students but represent over three-fifths of those who drop out or fail to graduate on time (Hernandez, 2001, p. 6). Eighty-eight percent of children graduate from high school on time. Only 4% of proficient readers do not graduate on time as compared to 16% of the students who do not read at grade level. Among those who are not proficient in reading, 9% of those with basic reading skills fail to graduate and 23% of students with below basic skills fail to graduate (Hernandez, 2011). In 2009, the National Assessment of Educational Progress reported only 33% of fourth graders read at a proficient level, 34% of students read at the basic level, and 33% of students read at a below basic level (Hernandez, 2011).

Effective Learning Environments that Facilitate Growth in Literacy

Every child develops and learns differently. As a result, some children learn well in a conventional classroom setting, whereas other students require a more individual approach.

Several different intervention approaches and environments exist designed to promote learning and reading comprehension. The Response to Intervention paradigm, or RTI, emphasizes the importance of providing multiple opportunities and approaches for children to learn. The RTI approach focuses on providing universal screenings, early intervention services, multitiered levels of support, evidence-based interventions, data-based decision intervention approaches, and student responsiveness (Jenkins, 2012). Since the support of RTI through the revision of IDEA in 2004, a majority of school districts implemented RTI at some level (Jenkins, 2012). The shift towards a more RTI focused education approach provides additional support and interventions to students at the first signs of academic struggling within the classroom rather than waiting for the student to fail (Klotz, 2007; Mesmer, 2008). The RTI model focuses on student responses to intervention approaches, not test scores (Mesmer, 2008).

The RTI model follows five basic steps. The first step begins with universal literacy screenings to identify potential students at risk. Students are screened approximately three times throughout the academic year (Mesmer, 2008). Step two focuses on implementing scientifically valid and data-driven interventions to children who show signs of struggling academically. If students do not respond to this level of intervention, further interventions may be warranted (Mesmer, 2008). Step three emphasizes progress-monitoring assessments evaluating the specific skills of the child. Progress-monitoring measures must be reliable, valid, and brief (Mesmer, 2008). Step four provides additional individualized intervention approaches for children continuing to struggle. Teachers, reading specialists, school psychologists, and parents collaboratively evaluate progress monitoring assessments to develop a more intense intervention approach. In step five, if the child continues to struggle, special education services are considered (Mesmer, 2008).

There are three main tiers for RTI, Tier 1, 2, and 3. A Tier 1 approach is a typical general education provided in a typically developing classroom. Students are identified as “at-risk” through universal screenings. When a child struggles in a Tier 1 classroom, a child is moved to Tier 2 interventions, such as small-group or one-on-one supplemental teaching. During this period, student progress is closely monitored. If progress is shown, the student typically returns to the general classroom program (NCLD, 2006). A Tier 3 approach focuses on the children continuing to struggle in Tier 1 or Tier 2 (Chard, 2008). During Tier 3, the student’s eligibility for additional special education services is considered (NCLD, 2006).

A multitude of opportunities to learn are available in a Tier 1 environment. Effective teaching in a Tier 1 environment incorporates embedded and explicit strategies to promote reading (Chard, 2008). Embedded strategies include activities such as children performing written activities around the classroom, and explicit strategies include activities such as modeling appropriate left to right reading (Chard, 2008). In a Tier 1 preschool setting, activities designed to foster literacy development include circle time, storybook reading, and dramatic play (Chard, 2008). Circle time introduces a daily routine, incorporates songs, conversations, and planning activities, and promotes skill generalization and practice. Storybook reading promotes interactive discussions about story plots and introduces print reading. Promoting discussion about storybooks promotes conversations, inferential reading, and alphabet knowledge. Dramatic play incorporates print into everyday activities, such as a teacher requesting students to go “grocery shopping” to collect items on a list (Chard, 2008).

In elementary school, an effective Tier 1 environment focuses on incorporating group work. Similar to preschool and kindergarten environments, group session reading fosters growth in vocabulary, comprehension, and fluency (Chard, 2008). Strong group work may look like a

teacher reading a book to students beyond their grade level to enhance vocabulary and comprehension. A teacher can preselect advanced vocabulary words and introduce them throughout the story and provide an appropriate definition within a familiar context to foster vocabulary growth (Chard, 2008).

Directed listening-thinking activities develop comprehension instruction. During story time, a teacher may ask students what they predict will happen in a story using inferential thinking and context (Chard, 2008). During group session storybook reading, children are introduced to fluent reading, phrasing, pausing, and appropriate expression (Chard, 2008). In addition to group session work, small groups of students at various skill levels promotes reading development. Through this approach, teachers group students together to focus on decoding and understanding phonemics and phonics of a text using a variety of skillsets and strengths (Chard, 2008).

In 1996, Velluntino et al. noted several students with poor reading skills with no other academic disabilities benefited greatly from early reading interventions. The lack of early intervention services available to this group of students contributed to their long-term reading difficulties. Strong early intervention models are prevention-focused, multitiered to meet the demands of all students, integrate, coordinate, and differentiate between different academic supports, screen and monitor progress, and employ strong-evidence based teaching practices (Chard, 2008).

High-quality early education is a cost-effective investment for school success, specifically for low-income students and minorities (Hernandez, 2011). Studies show gains made in high-quality preschools transfer over to later grades if preschool learning objectives line up with elementary school classroom objectives. The integrated preschool-third grade approach

includes six core components (Hernandez, 2011). The six components of a successful preschool-third grade approach includes an aligned curriculum, standards, and assessments from preschool through third grade, consistent instructional approaches and learning environments, availability of preschool through third grade, availability of preschool for all children ages 3-4 and full-day kindergarten for older children, classroom teachers with at least a bachelor's degree and teacher certification, a small class size, and strong partnership between school and families (Hernandez, 2011).

The Universal design for learning (UDL) provides flexibility in activities and information presentation, reduces barriers, provides appropriate supports and challenges, and maintains high standards for all students, including those with disabilities (The American Occupational Therapy Association [AOTA], 2015). Occupational therapists are specialized in activity analysis, environmental adaptations and modification, and assistive technology designed to facilitate success in the application of UDL in classroom settings (AOTA, 2015). UDL emphasizes multiple, flexible ways of presenting and engaging students with information so all students can participate and be successful in the classroom (AOTA, 2015). UDL focuses on diversity and variability of abilities rather than disabilities by promoting mainstream classrooms and specialized technology to promote success (AOTA, 2015).

Demographics

Gender. In addition to genetics, parental environment, and education opportunities, demographics predict and influence reading development. Grimm (2008) determined students on free or reduced lunch programs, students of Hispanic and African American descent, and boys tend to perform worse on reading comprehension and mathematics. Grimm (2008) reported females tend to have a faster rate of change as compared to male students in the same area of

research (Grimm 2008). Rootman (2005) reported girls scored significantly higher than boys on reading tests in the 2000 PISA (Rootman, 2005).

Ethnicity. Children from minority ethnicity groups are less likely to graduate. African American and Hispanic students are more likely to live in poverty, go to lower-performing schools, and live in poorer neighborhoods (Hernandez, 2011). In 2011, the National Assessment of Education Progress (NAEP) determined 42% of white students read at least at a proficient level in fourth grade, but only 16% of African American students and 17% of Hispanic read at a proficient level. Twenty-five percent of African American and Hispanic students in the survey who did not read at a proficient level by third grade did not graduate on time, as compared to 13% of students of other ethnicities. Graduation rates for African Americans and Hispanic students who were not proficient in reading were lower than their white peers with the same reading skills (Hernandez, 2011).

Poverty. Research shows children from low socioeconomic backgrounds experience more challenges with regards to special education services (Hunter, 2017). Students living in poverty experience more risk and adversity, ultimately affecting academic achievement (Lafavor, 2018). In 2014, the U.S. census data reported 21.1% of children live in poverty. Living in poverty impacts development in executive functioning, social and emotional competence, behavioral regulation, and overall academic achievement (Lafavor, 2018).

Twenty-two percent of children who have lived in poverty do not graduate from high school, compared to 6% of students who have never lived in poverty. Thirty-two percent of children who have spent half their childhood in poverty drop out or fail to graduate high school (Hernandez, 2011). Of the children who lived in poverty for at least one year and were not reading at a proficient level by third grade, 26% did not graduate high school, as compared to 9%

of below proficient readers who never experienced poverty. Eleven percent of top readers who experienced living in poverty for at least a year failed to graduate on time, compared to 2% of top readers who never experienced poverty (Hernandez, 2011).

Children whose family live in poverty more often than not lack resources for decent housing, health care, food, clothing, books, and access to high quality child and early education. Children from low socioeconomic families are more likely to live in poverty ridden neighborhoods with lower-performing schools, tend to have worse academic skills, and less academic success (Hernandez, 2011). Many children from low-socioeconomic families arrive to kindergarten with delays and inadequate language or social skills required for successful learning (Hernandez, 2011)

Children living in poverty miss more school than their peers due to poor health or family issues. The negative effect of school absences for low-income students is 75% greater than moderate-to-high income students. These students fall further behind their peers during the summer due to lack of access to stimulating educational programs and adequate meals (Hernandez, 2011). In 2011, the National School Lunch Program determined 55% of fourth graders' families from moderate-to-high income fell below the proficient mark, but 83% of children from low-income families fall below the proficient mark (Hernandez, 2011).

Individuals with Disabilities Education Act

In 1975, the federal government recognized a need to guarantee educational services to children with disabilities and passed the Education for All Handicapped Children Act (NCLD, 2006). In 1990, the name changed to The Individuals with Disabilities Education Act, or IDEA. The act was revised again to the most up to date version, the IDEA 2004 (NCLD, 2006). The

IDEA Act provides federal funds to schools to optimize special education services for children with disabilities. In addition, the act provides explicit guidelines to ensure a Free and Appropriate Education (FAPE) to children with disabilities (NCLD, 2006). Within the FAPE, children are entitled to receive special education services at “public expense, under public supervision and direction, and without charge to the parent, and that meet the standards of the state education department” (NCLD, 2006, p. 53). Special educational services are provided in accordance to Individualized Education Programs (IPE) (NCLD, 2006).

Eligibility for an IPE requires the student to show one or more of the 13 disabilities listed in IDEA. The disabilities include: autism, deaf-blindness, deafness, emotional disturbance, hearing impairment, mental retardation, multiple disabilities, orthopedic impairment, other health conditions, specific learning disabilities, speech or language impairment, traumatic brain injury, visual impairment, and developmental delay (NCLD, 2006, p. 67). In addition to having an identified disability, the student must require special education in order to make academic gains and benefit from the general education setting (NCLD, 2006).

If a student meets the requirements of an IPE, a draft of a proposed IPE is submitted to the school to determine specific needs. The IPE team consists of the child's parents, one general education teacher of the student, one special education teacher, a school district representative, an individual capable of interpreting evaluation results, individuals with specific knowledge or clinical expertise regarding the student and his or her specific disabilities, and the student, when appropriate (NCLD, 2006). The IPE plan considers the individual child's “academic, developmental, and functional needs” (NCLD, 2006, p. 104). The team develops measurable goals, supported by peer-reviewed research, to allow the child to participate in academics within the least restrictive environment (NCLD, 2006).

In addition to the act, the U.S. Department of Education published specific guidelines and federal regulations defining the act and how it should be interpreted within different schools. These regulations became effective on October 13, 2006 (NCLD, 2006). Along with specific guidelines and regulations imposed by IDEA, each state has one Parent Training and Information Center with information for parents regarding state specific special education and information on involvement in the special education process (NCLD, 2006).

An additional provision in the 2004 revision of IDEA includes early intervention services. This provision is designed to provide additional support to students who struggle in the general educational setting. IDEA 2004 allocates up to 15% of federal special education funds to facilitate early intervening services for children in grades kindergarten through twelfth grade not currently identified as having special education needs (NCLD, 2006). This money further trains teachers, provides educational and behavioral evaluations for students, provides remedial reading instructions, behavioral interventions, facilitates small group work, and aids in instruction and implementation of adaptive and instructional software programs (NCLD, 2006). All interventions funded through the early intervention service funds must be scientific and evidence-based (NCLD, 2006).

The latest version of IDEA 2004 includes the Elementary and Secondary Education Act, or the No Child Left Behind (NCLB), Reading First program. Designed to provide additional reading programs for children in kindergarten through third grade, the Reading First program allocates additional funds for teacher training, reading screenings and evaluations, and intervention material and strategies to improve reading delays (NCLD, 2006). The NCLB act focuses on stronger accountability for evaluation and screening results, increased flexibility and

local control, additional options for parental involvement, and stronger emphasis on teaching qualifications and methods (NCLD, 2006).

Since the latest revision in 2004, IDEA has become increasingly interested in implementing the RTI approach. This interest is due to the change in IDEA 2004 in which schools are no longer required to determine if a student shows a “severe discrepancy” between intellectual abilities and academic achievement with regards to having an identified specific learning disability (NCLD, 2006, p. 13). Prior to the 2004 revision, children had to show a “severe discrepancy” in one of the following areas: oral expression, listening comprehension, written expression, basic reading skills, reading comprehension, mathematics calculation, and or mathematics reasoning (NCLD, 2006,p. 33). The 2004 revision eliminated this portion as it allowed students to struggle and fail for a prolonged period of time prior to intervention services (NCLD, 2006).

Reading Interventions and Specialists

Reading specialists provide alternative services to students to accommodate their needs as well as provide education for teachings regarding the reading process and additional reading instructions (Woodwar, 2009). According to the International Reading Association, a highly qualified literacy professional must have previous experience as a classroom teacher and is responsible for “supporting, supplementing, and extending quality classroom teaching” (Woodwar, 2009). In addition, the IRA highlights three main objectives for reading specialists; provide expert instruction for struggling readers, guide assessment efforts, and provide leadership for school reading programs (Hathway, 2016).

In the Standards for Reading Professionals, the IRA stated reading specialists must be capable of teaching students who struggle with reading, serve as a literacy coach, and or supervise and coordinate reading programs for school (Hathway, 2016). The five qualifications to meet the needs of an effective reading specialists include; “foundational knowledge, knowledge of instructional strategies and curriculum materials, knowledge of assessments and evaluations, the ability to create a literate environment, and the ability to conduct professional development” (Hathway, 2016).

Although many children would benefit greatly from reading specialist interventions, test scores determine eligibility in most cases (Woodwar, 2009). The No Child Left Behind act requires mandatory testing for students in third through eighth grade. The number of students who fall below grade level or qualify for additional services continues to increase (Woodwar, 2009). School districts determine where additional support is needed based on five targets identified by the National Reading Panel: comprehension, fluency, vocabulary, phonemic awareness, and phonics (Woodwar, 2009). According to the RTI model, students who struggle in the typical classroom setting qualify for additional services from reading specialists (Woodwar, 2009). Students who qualify for more intense interventions typically continue to fall further behind their peers due to a lack of foundational skills (Woodwar, 2009).

The U.S Department of Education identified 10 key characteristics of an effective reading intervention; small group sizes of three to six students with similar reading difficulties, daily intervention for 30 minutes, interventions targeted at addressing the five key components of reading instruction, explicit and direct instruction that is both engaging and fast paced, feedback for errors, and ample opportunities to respond to questions (Woodwar, 2009).

Additional reading support as a separate intervention outside of the classroom may benefit students who require individualized attention and a quieter setting (Woodwar, 2009). In addition, some reading interventions are specifically formatted away from the classroom (Woodwar, 2009). Smaller group settings increase student confidence and comfortability with specific reading skills (Woodwar, 2009). Although separated intervention benefits some students, separated intervention is subject to stigmatization. There is some concern regarding separated intervention and the lack of interaction with the regular classroom and peers (Woodwar, 2009).

In addition to separated intervention, reading specialists provide additional support within the classroom setting. One approach for classroom intervention is student-focused coaching. This approach focuses on collaborative problem solving between both the regular classroom teacher and the reading specialist to identify and address a specific problem and develop an appropriate plan (Woodwar, 2009). The teachers and reading specialists collect data from observing the student's responses to interventions and different instructional approaches (Woodwar, 2009). Benefits from classroom support receive less stigmatization and maximize instructional time within the classroom setting (Woodwar, 2009).

In addition to reading specialists, literacy coaches provide professional development for teachers, conduct group presentations, facilitate teacher study groups, work individually with teachers, and provide supplemental information for grade level meetings (Hathway, 2016). Literacy coaches promote student learning. In the Standards for Reading Professionals, the IRA defined a literacy coach as "a reading specialist who provided professional development for teachers by supplying the additional support needed to implement a variety of instructional

practices and programs” (Hathway, 2016). Several of the literacy coach roles fall under the identified services of a reading specialist (Hathway, 2016).

Occupational Therapy in the School System

Occupational therapy supports children in performing daily activities and occupations important to them, like playing, learning, sleeping and resting, social interaction, grooming and self-care, and dressing. Occupational therapy evaluates how a particular condition affects a child’s participation in necessary and desired occupations (AOTA, n.d). With the help of their parents, occupational therapists work with the child to determine what they child can do, needs to do, and wants to do in order to create an intervention plan. Occupational therapy facilitates personal growth and caregiver strategies for families (AOTA, n.d.).

Occupational therapists in the school system evaluates a child’s skills and barriers to a desired or necessary performance, the environment and contextual factors, and the required learning task to make appropriate modifications or suggestions to facilitate learning (AOTA, 2015). Occupational therapists focus on participation in academic and nonacademic factors, like math, reading, writing, physical education, recess, sports, vocational self-help skills and activities of daily living (Reeder, 2010). The occupational therapist collaborates with educators, administrators, and parents to determine and direct appropriate services. Occupational therapists suggest appropriate adaptive devices to facilitate independence in learning (AOTA, 2015). Trained in environmental assessments and evaluations, occupational therapists help identify potential barriers or supports to the student’s performance and provide recommendations for alternative strategies to facilitate classroom success. Occupational therapist encourages student participation and positive behavior (AOTA, 2015; AOTA, n.d.). In addition to the aforementioned roles, occupational therapists can aide in developing individualized student

goals, modify equipment, utilize assistive technology, provide suggestions for managing classroom behaviors, and create interventions (Reeder, 2010).

Within the school setting, occupational therapists help students identify long-term goals for post-school and provide transitional interventions and strategies for after high school. Occupational therapists collaborate with the student to develop self-advocacy and self-determination, improve performance in learning environments throughout the school setting, and facilitate success in desired and necessary performances through specific strategies and accommodations (AOTA, 2016). The occupational therapist collaborates with the parents to promote engagement in school activities, homework management, and to monitor success and any potential issues (AOTA, 2016).

Occupational therapists collaborate with administrators to provide adequate and appropriate training for students, staff, and parents in addition to recommendations for the school buildings and curriculum to support a UDL (AOTA, 2016).

Occupational Therapy and Reading Delays

While limited literature regarding the role of occupational therapy and reading interventions exists, one article highlights considerations for this topic. The holistic approach of occupational therapy allows for interventions to address several potential factors in reading delays. Reading requires student interest and motivation in the occupation, for the student to possess the skills required to perform at grade level, a level of familiarity with the material, preferences over reading choices, and self-efficacy throughout the process (Grajo, 2014). Historically, occupational therapists mainly address handwriting issues in school. Research shows a high predictive value of early writing ability and later success in reading and literacy

development (Gerde, 2014). Engagement in invented spelling requires children to understand phonemics and helps children decode words, skills necessary for reading and writing.

Occupational therapists encourage children to write leisurely and read their work aloud to bridge the connection between reading and writing (Gerde, 2014).

Recently, the Diagnostic and Statistical Manual of Mental Disorders replaced the term *dyslexia* and *reading disorders* to “specific learning disorders with impairments in reading” (Grajo, 2014). This change highlights a shift towards a more global understanding of disabilities and reading beyond skill acquisition, allowing occupational therapists to showcase their holistic therapy approach (Grajo, 2014). Occupational therapy in reading interventions focuses on increasing engagement in reading as an occupation, allowing the child to develop the skills more efficiently and effectively (Grajo, 2014).

Occupational therapy as an intervention for reading difficulties is not limited to visual-perceptual, cognitive, or sensory processing skills, but on a holistic approach (Grajo, 2014). Engagement and participation in reading occupations encourages development of autonomy in problem solving and emphasizes feelings of mastery. The ultimate goal of occupational therapy is to increase motivation and feelings of self-mastery through engagement in academic, leisure, and functional reading within the school, home, and community contexts (Grajo, 2014).

The practice model, the Occupation of Reading, led by Lenin Grajo and framed by the theory of occupational adaption, emphasizes the importance of a multidimensional approach using five basic steps (Grajo, 2014). The first step emphasizes participation and engagement in the occupation of reading (Grajo, 2014). The occupational therapist should allow the child to choose the reading material and be directly involved in the goal making process. The aim of the intervention should shift from teaching the child skills to read to reading as an occupation (Grajo,

2014). The occupational therapist can assist the child in determining where they want to read, what they want to read, and encourage participation. Participation and engagement in the occupation increases with client-centered and meaningful goals. The Occupation of Reading practice model assumes when a child engages and participates in meaningful reading activities, the child feels confident in reading, allowing reading skills to be transferred and generalized to various academic contexts (Grajo, 2014).

The second step focuses on self-generation of strategies (Grajo, 2014). During the occupation of reading, the occupational therapist should refrain from correcting the child's mistakes but should ask questions and let the child come to conclusions about his or her mistakes on their own (Grajo, 2014). Questions should allow the child to develop corrective strategies for his or her mistakes. Having the child name their strategy is a useful intervention tool. This intervention allows the specific reading strategy to become more personalized and meaningful, facilitating use of the strategy as compared to strategies taught by the therapist (Grajo, 2014). During this intervention, the therapist should avoid giving direct instruction to children. Children in elementary school receive hours of direct instruction from teachers, parents, etc., and the child needs to feel in control of the therapy session and in control of achieving his or her goals (Grajo, 2014).

The third step involves use of various contexts (Grajo, 2014). When the occupational therapist utilizes various contexts, acquired skills are more likely to be generalized and transferred to other academic domains. Facilitating the use of reading academically, for leisure, and functionally, in various contexts allows opportunities for practice, use of strategies, and for the student to incorporate academic reading goals into multi-contextual activities. The child should be encouraged to create his or her own contexts in which reading is done "routinely,

naturally, and actively as a part of his or her therapy and daily repertoire of activity choices” (Grajo, 2014, p. 17).

Occupational therapists should collaborate closely with parents and teachers to monitor progress and participation (Grajo, 2014). Parents can use a journal to provide feedback on how often the child initiates and participates in reading outside of academics (Grajo, 2014). Teachers can provide feedback on classroom observation on change in confidence and performance in reading. Collaboration with parents and teachers should emphasize the importance in allowing the child to be creative and in control in their designated contexts (Grajo, 2014). Occupational therapists, teachers, and parents should avoid assuming the “expert” role and allow the child to engage in child-initiated reading activities (Grajo, 2014).

The final step in the Occupation of Reading practice model is to facilitate mastery and competence (Grajo, 2014). When a child feels confident in his or her level of mastery and competence in reading, they are more likely to be successful. Grading reading activities allows for gradual progress. Celebrating small victories empowers the child to feel successful in their reading abilities and feel responsible for their success (Grajo, 2014).

Occupational Therapy and Response to Intervention

Under IDEA 2004, occupational therapy services include “developmental, corrective, and other supportive services as are required to assist a child with a disability to benefit from special education” (AOTA, 2012). Occupational therapists generally work in interdisciplinary teams with schools and teachers to promote physical, cognitive, behavioral, social and emotional development, and communication (AOTA, 2012). Within the school setting, occupational therapists promote the development of academic and functional participation in school, home,

and community life (AOTA, 2012). Similar to occupational therapy interventions in other settings, occupational therapy in the school system utilizes a holistic, evidence-based approach to provide interventions (AOTA, 2012). The level of involvement of occupational therapy within the school system under IDEA 2004 currently limits therapists to screening and evaluating children currently receiving or in consideration for special education services (AOTA, 2012). However, under IDEA 2004, occupational therapists can act as providers for early intervention services within the general classroom setting (AOTA, 2012).

Within the last decade, occupational therapy services have begun to expand past direct services exclusively. In a census at the 2010 Occupational Therapy Compensation and Workforce Study, 62% of occupational therapists practiced primarily direct client interventions and 34.4% provided indirect interventions, administrative work/and or consultation (AOTA, 2012). In 2007, AOTA published a fact sheet regarding potential roles for occupational therapists within the RTI process (Reeder, 2010).

Under the RTI model, 80% or more of students should perform at the established academic standards. If less than 80% perform at this level, additional and alternative instructional practices may be utilized (AOTA, 2012). Occupational therapy intervention within the RTI is currently limited but could provide several benefits to a variety of students (AOTA, 2012). Within the RTI scope, problem solving is an important component. According to RTI framework, problem solving includes, "identification of the problem, generation of hypotheses that account for the cause of the problem, development and implementation of a plan to address the problem that is conceptually congruent with the proposed hypothesis, and evaluation of the effectiveness of the plan in diminishing the problem" (Cahill, 2014, p. 234).

Few studies show how occupational therapy provides benefits within the RTI scope; however, some studies exist (Cahill, 2014). Within Tier 1 of the RTI model, occupational therapists can conduct educational workshops for teachers and professional in early education and childhood development on sensory processing deficits, how to conduct handwriting screenings for younger students, provide recommendations for classroom behavior management, and or assist new teachers in establishing classroom routines (AOTA, 2012). Within Tier 2, occupational therapists can provide strategies to facilitate academic growth in children who struggle in the general education setting. Services include working with teachers on developing appropriate intervention plans for smaller groups of struggling students with handwriting skills or behavioral management (AOTA, 2012). For Tier 3 children, occupational therapy services can include sensory or organization strategies to foster academic development (AOTA, 2012).

In addition to specific strategies within the different tiers, occupational therapists can be involved in progress monitoring and data collection to help develop appropriate intervention plans for struggling students. Occupational therapists can analyze progress data and make appropriate recommendations for children who require a more intensive therapy approach (AOTA, 2012).

In a national survey of occupational therapy practitioners' level of involvement in the RTI process, 1,000 surveys were distributed randomly to practitioners in AOTA's Early Intervention and School Systems Special Interest Selection to determine practitioners' attitudes towards occupational therapy intervention in the RTI model. Of the 1,000 surveys distributed, 276 practitioners responded (Cahill, 2014). Of the 276 practitioners, 77.5% responded RTI was implemented at some level within their school districts (Cahill, 2014). Ten percent of

participants stated their districts were not considering implementation of RTI, and 11.9% reported their districts were considering the implementation of RTI (Cahill, 2012).

The majority of participants believed active participation in RTI is beneficial to occupational therapy, however, 60.1% of participants state school districts do not fully understand occupational therapy and the benefits it could provide for RTI (Cahill, 2014). Over half of the participants indicated fellow colleagues expressed a desire for occupational therapy to become more involved in the RTI process (Cahill, 2014). Approximately half of practitioners believed their clinical expertise was not utilized to the fullest extent within the school system and occupational therapy contribution would greatly benefit students and educators (Cahill, 2014).

Participants recognized kindergarten through third grade as the most involved in the RTI process, followed closely by preschool and fourth through eighth grade (Cahill, 2014). The domains most often addressed in RTI were activities of daily living, social participation, and play (Cahill, 2014). Fifty-six percentage of participants stated they were involved in some level of school-based problem solving, 53.3% were involved in coaching, and 50.4% were involved in direct intervention with students receiving RTI services (Cahill, 2014).

Sixty-seven percent of participants believe school or district guidelines regarding occupational therapy involvement in the RTI would help to increase participation. According to 50.4% of participants, heavy caseloads with increased responsibilities and multiple students with special needs negatively impact their ability to engage in the RTI process (Cahill, 2014). In addition, continuing education opportunities on providing services in RTI and guidance on how to advocate for change from a caseload to workload model would positively impact RTI involvement (Cahill, 2014). According to 39.5% of participants, clearer interpretation of national policies would also increase RTI involvement (Cahill, 2014).

Current and New Research

Recently several countries have implemented newborn literacy programs to foster literacy-rich environments between parents and children (Letourneau, 2015). These programs teach parents pro-literacy activities, such as reading and rhyming, to promote literacy development. Letourneau (2015) recruited convenience samples from three Canadian provinces, Nova Scotia, Prince Edward Island, and New Brunswick, and to perform a quasi-experimental approach to determine the effectiveness of newborn literacy programs.

Parents were asked how often they intended to read to their children in a prenatal questionnaire and asked how many times a week they actually read to their children in a postnatal questionnaire. Parents were also asked at what age they intended to start reading to their child and how old they actually were in pre and postnatal questionnaires, respectively. The questionnaire asked parents how important they perceived reading to their children was and how reading influenced their child's physical or social development, intelligence, and relationship with parents. Participation in the newborn literacy resulted in higher importance placed on literacy behaviors, how often and when they would read to their children, perception of the importance of reading, and developmental areas influenced by reading, as compared to the control group (Letourneau, 2015). When the parents received the intervention, they were more likely to report reading to their children at younger ages, reported more enjoyment reading to their children, emphasized greater importance in reading to children, and more overall positive parent-child interactions (Letourneau, 2015).

Research Questions

Occupational therapy is a holistic profession. Occupational therapists analyze a multitude of factors contributing to a deficit in any meaningful or desired activity. Although an established profession for over a century, many people are unaware of several of the benefits of occupational therapy. Within the school system, occupational therapists most commonly provide services for students with Autism, ADHD, handwriting delays, and students struggling with participation in academic, social, and leisure activities. Although rarely utilized or researched, occupational therapy can be a beneficial intervention for children with reading delays. In most schools, children do not receive intervention, especially services like occupational therapy, until they experience significant delays and qualify for an IEP or 504 plan. Within the past few years, more schools are utilizing the RTI model to assist children who are struggling in the typical classroom setting but are not yet eligible for an IEP.

For my project, I want to focus on teacher perception of occupational therapy within the RTI model for reading delays. By identifying students who are struggling earlier on and providing a holistic approach, low literacy levels would conceivably decrease and promote both academic success and higher rates of high school graduation.

Research questions are as follows:

1. To the teacher's knowledge, are occupational therapy services currently available to students in the Response to Intervention model?
2. Do teachers perceive occupational therapy intervention within the Response to Intervention model beneficial for reading delays?

Method

Introduction

This research was a preliminary study intended to explore teacher perception of occupational therapy within the Response to Intervention model for reading delays (Smith, 2015). All research received Institutional Review Board approval.

Specific research questions were as follows:

1. To the teacher's knowledge, are occupational therapy services currently available to students in the Response to Intervention model?
2. Do teachers perceive occupational therapy intervention within the Response to Intervention model beneficial for reading delays?

Design

Research was a preliminary study conducted following a mixed methods approach (Aramo-Immonen, 2011; Smith, 2015). Survey questions were constructed as close-ended and structured, Likert scale, and multiple-choice questions. Both single- and multiple-response categories were included depending on the nature of the question (Cowles, 2015). Check-all-that-apply questions were also utilized (O'Leary, 2017). Research was conducted via an electronic survey. The survey was created on Microsoft Forms, owned by Elizabethtown College. Participants were provided with information regarding consent prior at the start of the survey.

Participants

Sixty-seven participants completed the survey. The Primary Researcher (PI) utilized three tiers of participant recruitment. All research was approved by Institutional Review Board prior to recruitment. PI used snowball and convenience sampling to form the initial sample pool (McCombes, 2019). PI identified eleven elementary schools from previous connections. Initial recruitment email was sent to the principals of the eleven identified elementary schools. The

email described the purpose of the research and requested site consent. Site consent was received from seven of the eleven identified schools. When site consent was received, an additional email was sent to the designated individuals responsible for distributing the surveys. If no alternative individual was identified by the principal, the email for survey distribution was sent directly to the elementary school principals.

The email for survey distribution contained the research purpose and instructions for survey completion. The beginning of the survey included participant consent information. Participant consent information included the study's purpose, survey instructions, risks and discomforts, benefits, compensation policy, confidentiality, withdrawal procedures, and contact information. Since participation was strictly voluntarily, the sample pool included elementary school teachers willing to participate in the study.

Despite receiving site consent from seven schools, participant response rates were low, therefore, PI utilized a second approach to recruitment. PI used convenience sampling and identified a retired elementary school aide. With the assistance of the aid, ten more participants were recruited. The retired elementary school aide contacted actively employed and retired elementary school teachers and explained the purpose of the study. The participants were instructed to respond whether or they would be willing to participate and to include their email addresses for the PI to contact. Ten participants were recruited from the aforementioned method. Once consent and email addresses were received, PI sent an email containing the purpose and instructions for survey completion. The beginning of the survey included participant consent information.

PI utilized a third tier of participant recruitment. PI posted a Facebook post containing the survey purpose, inclusion criteria, and instructions for completion to identify additional

participants. The post contained information for instructions on how to share the post to recruit more participants.

Inclusion and exclusion criteria

When the survey was created, the initial sample pool was actively employed elementary school teachers. However, since response rates were low, the survey was already created and active, and the survey link was posted to Facebook, the sample pool was extended to incorporate retired elementary school teachers as well. No question clarifying whether or not participants were retired was added. PI interpreted participant group of *15+ years* as potentially including a population of retired teachers.

One participant did not answer Question 6. Two participants did not answer Question 7. One participant did not answer Question 8. Sixty-six participants answered Question 13, 62 participants answered Question 14, and 66 participants answered Question 15 and Question 17. All other demographic questions were answered by all participants.

Pearson Chi Square and p-value results were included for all analysis. Spearman correlation results were reported if results met the minimum “weak” or “poor” interpretation of +0.1 or -0.1 (Akroglu, 2018).

No data was excluded due to the emphasis on solely elementary teachers answering the survey in the recruitment email and Facebook post. Participants who did not answer all survey questions were still included in data analysis. Any question left unanswered was understood as an issue with terminology or interpretation. No screening questions were utilized during the survey since only elementary school teachers were recruited for the study. The revised

requirement for participation was the participants must be retired or practicing elementary school teachers.

Instruments utilized

Survey was created using Microsoft Forms owned by Elizabethtown College. Survey questions were created based on evidence-based practice and peer-reviewed articles outlined in the literature review. PI aimed to focus on teacher perception of occupational therapy within the RTI model for reading delays to determine if teachers perceive earlier occupational therapy intervention for reading as potentially beneficial.

The survey questions (See Appendix A) were developed from existing literature related to the value of the RTI model and the role of occupational therapists in providing reading support.

Data collection

Research data was collected through a Microsoft Forms survey. Survey opened on February 18th, 2020. Only four responses were recorded as of March 12th, 2020. PI extended participant sample pool with tier two and tier three approach. After sample pool was extended, PI received 62 more responses. Survey was closed on March 27th, 2020. Participants completed the survey in an average of 5 minutes. Survey responses were recorded anonymously, and no identifying information was collected.

Data analysis

Sixty-seven participant responses were collected. Demographic information collected included the grade participants taught, how long participants have been teaching, level of

education received, favorite subject to teach, and ethnicity of the majority of students in their classrooms. Data was collected on Microsoft Forms. Survey responses were collected and exported into an Excel sheet. Responses were exported and analyzed using IBM SPSS Statistics 26 to perform descriptive statistics.

Statistical analysis was performed on two survey questions. The questions were chosen as they answered the study purpose. The two questions were Question 12, “are occupational therapy services available to students in the different Response to Intervention piers?” and Question 13, “do you think occupational therapy would be a beneficial addition to the Response to Intervention model for students with READING DELAYS? (not including written expression).”

PI analyzed data using crosstabulations to determine the frequency of responses in a two-dimensional table that share the specific characteristics described (Qualtrics, 2020). PI utilized Pearson Chi-Square analysis to determine the statistical significance of the crosstabulation table to determine whether or not the variables are independent or related (Qualtrics, 2020). PI utilized Spearman correlation to measure the strength and direction of association between two ranked variables (Statistics Solutions, 2020).

Credibility/trustworthiness

Survey questions were created based on evidence-based practice and peer-reviewed articles, outlined in the literature review and instruments section. Survey was pilot tested by primary advisor, Dr. Kerri Hample, OTD, OTR/L, FMCHC, Associate Professor of Occupational Therapy at Elizabethtown College, and secondary adviser, Dr. Shannon Haley-Maize, Associate Professor of Education at Elizabethtown College. PI utilized personal connections to identify two more accredited professors to pilot-test survey. Survey was pilot tested by Dr. Dave White,

Professor in the School of Community Resources and Development at Arizona State University, and Dr. Rebecca M.B. White, Associate Professor in the T. Denney Sanford School of Social and Family Dynamics at Arizona State University.

Ethical considerations

There were no risks or ethical considerations associated with the research project. No private information was collected. Participants received no direct benefit or harm from the survey but contributed to a greater understanding of occupational therapy.

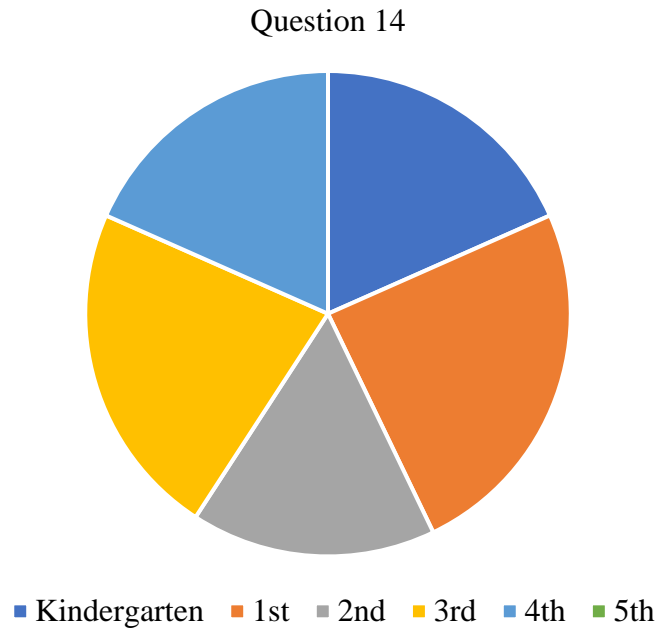
Demographics

Five survey questions collected demographic information. The questions were grade taught (Question 14), how long participants have been teaching (Question 15), level of schooling received (Question 16), favorite subject to teach (Question 17), and ethnicity of majority of students in their classroom (Question 18).

Sixty-two participants answered Question 14. Nine participants taught kindergarten, 12 taught first grade, 8 taught second grade, 11 taught third grade, 9 taught fourth grade, and 13 taught fifth grade.

Figure 1

Grades Participants Taught

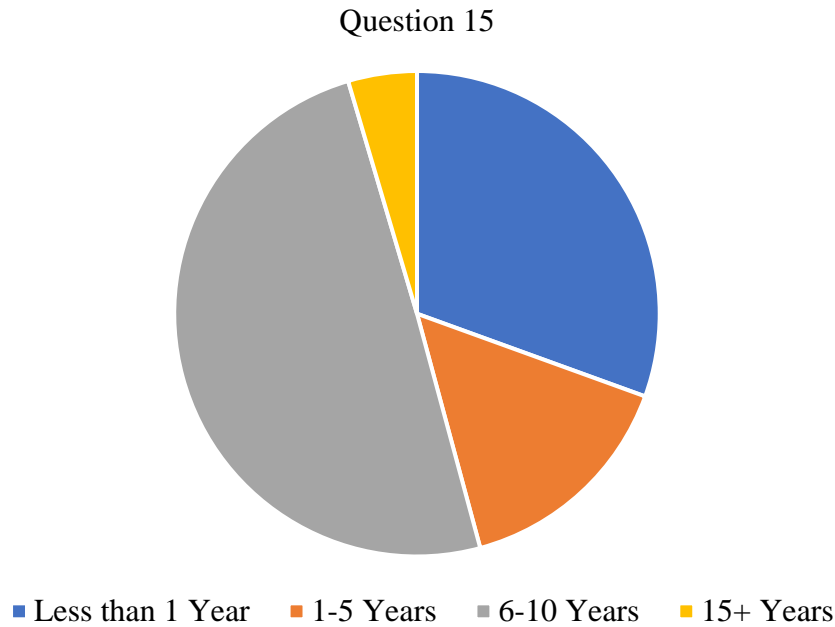


Note. This figure represents the grade participants taught.

Sixty-six participants answered Question 15. Eight participants reported teaching for less than 1 year, 4 reported teaching for 1-5 years, 8 reported teaching for 6-10 years, 13 reported teaching for 11-15 years, and 33 reported teaching for 15+ years.

Figure 2

Years of Teaching Experience

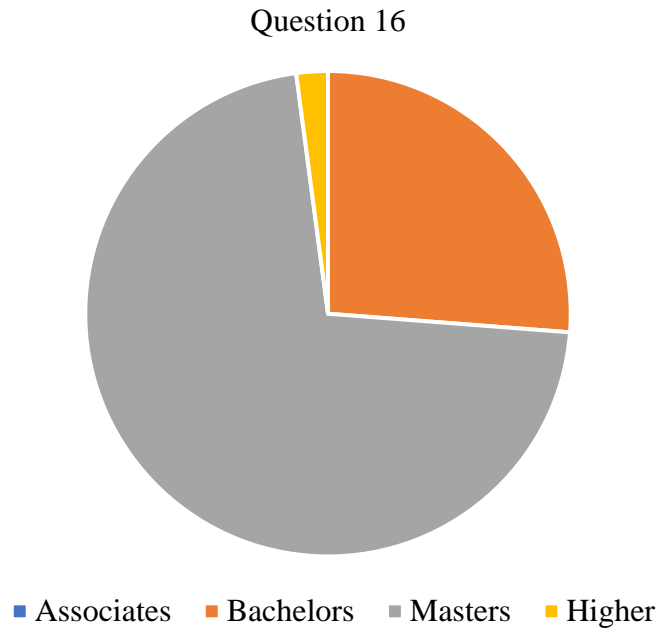


Note. This figure represents how long participants have been teaching.

All 67 participants answered Question 16. No participants had an associate degree, 15 reported having a bachelor's degree, 41 reported having a master's degree, and 11 reported having a *higher* level of education.

Figure 3

Level of Education

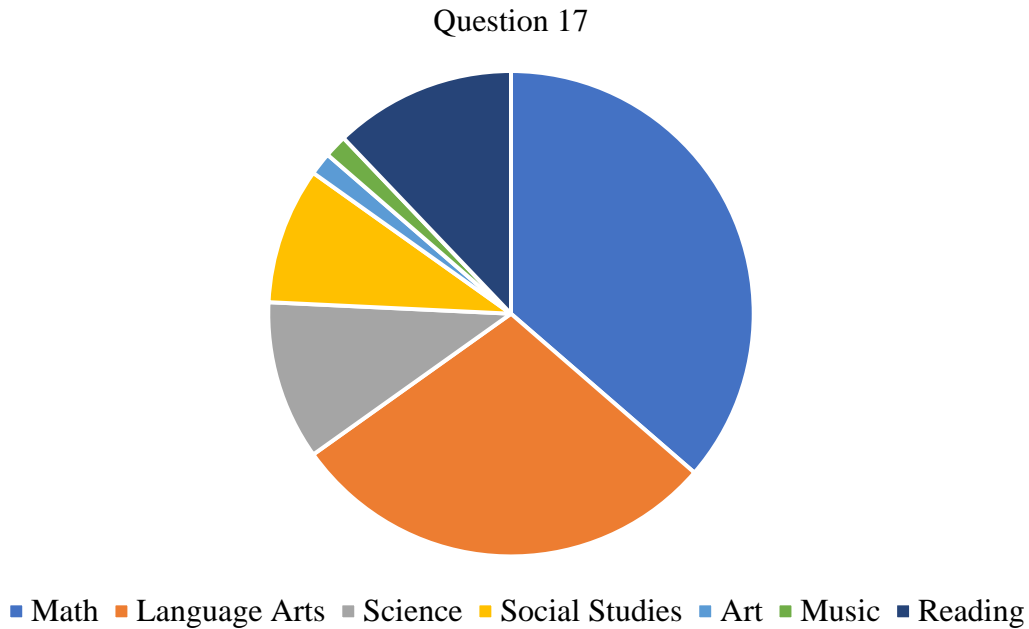


Note. This figure represents the level of education participants received.

Sixty-six participants answered Question 17. Twenty-four participants reported math as their favorite subject, 19 answered language arts, 7 answered science, 6 answered social studies, 1 answered art, 1 answered music, and 8 answered reading.

Figure 4

Favorite Subject to Teach

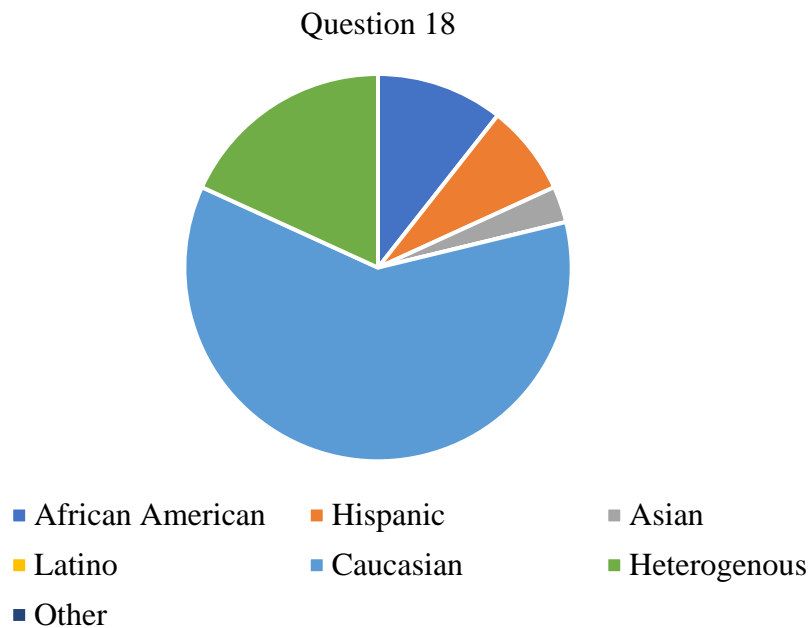


Note. This figure represents participants favorite subject to teach

All 67 participants answered Question 18. Seven participants reported majority of student ethnicity as African American, 5 reported Hispanic, 2 reported Asian, 0 reported Latino, 40 reported Caucasian, 12 reported heterogenous, and 1 reported other.

Figure 5

Ethnicity of Students



Note. This figure represents the ethnicity of the majority of students in participants' classrooms.

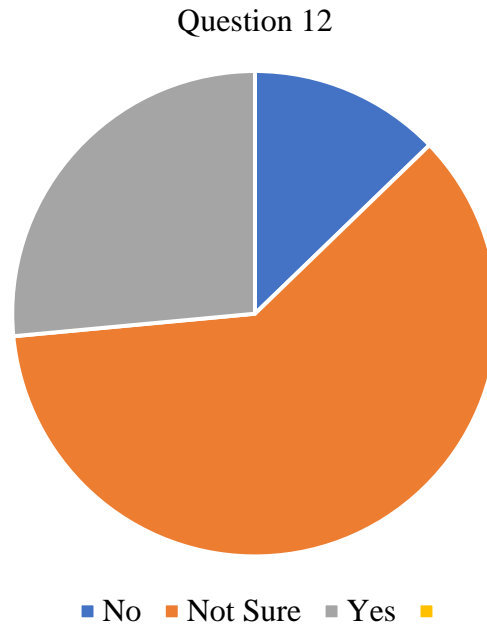
Results

Are occupational therapy services available to children in the different Response to Intervention piers? (Question 12)

Sixteen percent of participants reported occupational therapy was not available in the RTI model, 25% reported occupational therapy was available, and 58% reported they were not sure if occupational therapy was available.

Figure 6

Participant Responses to Survey Question 12



Note. This figure represents participant responses to the question, "are occupational therapy services available to students in the different Response to Intervention piers?"

Data showed no statistically significant association (Pearson Chi Square .593, p-value was .743) between level of familiarity with occupational therapy (Question 1) and Question 12.

Table 1

Question 1 and Question 12 Crosstabulation

| | | Question 12 | | | Total |
|------------|-------------------|-------------|----------|-----|-------|
| | | No | Not sure | Yes | |
| Question 1 | Somewhat familiar | 7 | 27 | 10 | 44 |
| | Very Familiar | 4 | 12 | 7 | 23 |
| Total | | 11 | 39 | 17 | 67 |

Data showed no statistically significant association (Pearson Chi Square 3.728, p-value .155) between how important participants perceived occupational therapy to be (Question 2) and Question 12.

Analysis determined a statistically significant association (Pearson Chi Square 26.283, p-value .000) between how familiar participants were with the RTI model (Question 10) and Question 12. There was a weak positive correlation (Spearman correlation .175) the two variables.

Table 2

Question 10 and Question 12 Crosstabulation

| | | Question 12 | | | Total |
|-------------|---------------------|-------------|----------|-----|-------|
| | | No | Not sure | Yes | |
| Question 10 | Not at all familiar | 0 | 11 | 0 | 11 |
| | Somewhat familiar | 3 | 21 | 3 | 27 |
| | Very familiar | 8 | 7 | 14 | 29 |
| Total | | 11 | 39 | 17 | 67 |

Analysis determined a statistically significant association (Pearson Chi Square, 41.207, p-value .000) for relationship between knowledge of other types of therapies available in the RTI model (Question 11) and Question 12. There was a moderately strong correlation (Spearman correlation .515) between the two variables.

Table 3

Question 11 and Question 12 Crosstabulation

| | | Question 12 | | | Total |
|-------------|----------|-------------|----------|-----|-------|
| | | No | Not sure | Yes | |
| Question 11 | No | 8 | 4 | 2 | 14 |
| | Not sure | 1 | 27 | 2 | 30 |
| | Yes | 2 | 8 | 13 | 23 |
| Total | | 11 | 39 | 17 | 67 |

Data showed no statistically significant association (Pearson Chi Square 8.204, p-value .609) between the grade participants taught (Question 14) and Question 12. There was a very weak negative correlation (Spearman correlation -.145) between the two variables.

Data showed no statistically significant association (Pearson Chi Square 14.725, p-value .065) between how long participants taught (Question 15) and Question 12.

Table 4

Question 15 and Question 12 Crosstabulation

| | | Question 12 | | | Total |
|-------------|------------------|-------------|----------|-----|-------|
| | | No | Not sure | Yes | |
| Question 15 | Less than 1 year | 1 | 4 | 3 | 8 |
| | 1-5 years | 1 | 1 | 2 | 4 |
| | 6-10 years | 0 | 7 | 1 | 8 |
| | 11-15 years | 5 | 3 | 5 | 13 |
| | 15+ years | 4 | 23 | 6 | 33 |
| Total | | 11 | 38 | 17 | 66 |

Analysis determined a statistically significant association (Pearson Chi Square 18.869, p-value .002) between level of education received (Question 16) and Question 12.

Table 5

Question 16 and Question 12 Crosstabulation

| | | Question 12 | | | Total |
|-------------|-----------|-------------|----------|-----|-------|
| | | No | Not sure | Yes | |
| Question 16 | Bachelors | 1 | 9 | 5 | 15 |
| | Masters | 7 | 29 | 5 | 41 |
| | Higher | 3 | 1 | 7 | 11 |
| Total | | 11 | 39 | 17 | 67 |

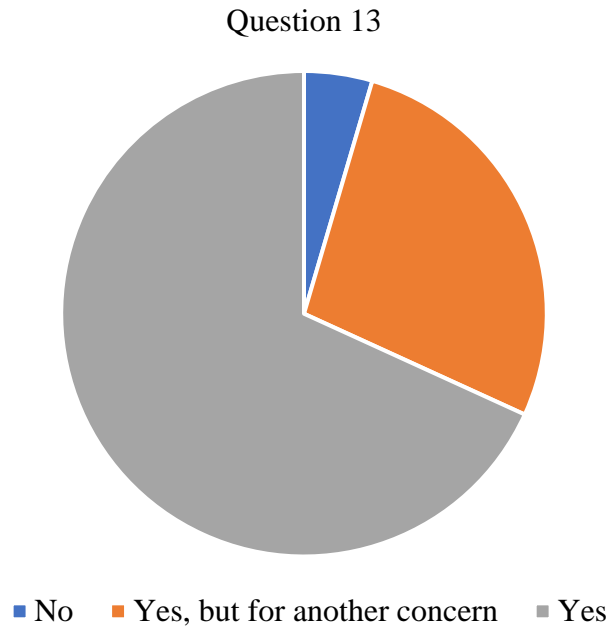
Data showed no statistically significant association (Pearson Chi Square 7.850, p-value .797) between participant's favorite subject to teach (Question 17) and Question 12.

Do teachers perceive occupational therapy as a beneficial intervention for reading delays in the Response to Intervention Model? (Question 13)

Five percent of participants reported they did not believe occupational therapy would be a beneficial intervention for reading delays, 27% believe occupational therapy would be a beneficial addition, but for another concern, and 68% of participants believe occupational therapy would be a beneficial addition for reading delays in the RTI model. One respondent did not answer the question.

Figure 7

Participant Responses to Survey Question 13



Note. This figure represents participant responses to the question, "do you think occupational therapy services would be a beneficial addition to the Response to Intervention model for reading delays"

Data showed no statistical difference (Pearson Chi Square .000, p-value 1.000, Spearman correlation .000) between how familiar participants were with occupational therapy (Question 1) and Question 13.

Table 6

Question 1 and Question 13 Crosstabulation

| | Question 13 |
|--|-------------|
| | |

| | | Not | Yes, but as an intervention for another concern | | Total |
|------------|-------------------|-----|---|-----|-------|
| | | | | Yes | |
| Question 1 | Somewhat familiar | 2 | 12 | 30 | 44 |
| | Very Familiar | 1 | 6 | 15 | 22 |
| Total | | 3 | 18 | 45 | 66 |

Data determined no statistically significant association (Pearson Chi Square .231, p-value .891) between how important teachers perceive occupational therapy to be (Question 2) and Question 13.

Data showed no statistically significant association (Pearson Chi Square .705, p-value .703) between level of concern for handwriting delays (Question 3 – Handwriting) and Question 13. There was a very weak negative correlation (Spearman correlation -.103) between the two variables.

Table 7

Question 3 - Handwriting and Question 13 Crosstabulation

| | | Question 13 | | | |
|--------------------------|---------------------|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | | Total |
| | | | | Yes | |
| Question 3 - Handwriting | Somewhat concerned | 1 | 7 | 22 | 30 |
| | Extremely concerned | 2 | 11 | 23 | 36 |

| | | | | |
|-------|---|----|----|----|
| Total | 3 | 18 | 45 | 66 |
|-------|---|----|----|----|

Analysis determined a statistically significant association (Pearson Chi Square 19.215, p-value .001) between level of concern for reading delays (Question Three – Reading delays) and Question 13. There was a moderate positive correlation (Spearman correlation .370) between the two variables.

Table 8

Question 3 - Reading and Question 13 Crosstabulation

| | | Question 13 | | | |
|----------------------|----------------------|---|-----|-----|-------|
| | | Yes, but as an intervention for another concern | | | Total |
| | | Not | Yes | Yes | |
| Question 3 - Reading | Not at all concerned | 2 | 8 | 2 | 12 |
| | Somewhat concerned | 0 | 7 | 28 | 35 |
| | Extremely concerned | 1 | 3 | 14 | 18 |
| Total | | 3 | 18 | 44 | 65 |

Association between concern and awareness of developmental delays associated with reading difficulties and perception of the benefits of occupational therapy within the RTI model for reading delays (Question 4 and Question 13)

As outlined in the literature review, there are numerous developmental delays indicative of reading difficulties (Bellocchi, 2017; Cabell, 2008; Handley-Moore, 2015). PI aimed to

explore whether or not there were statistically significant associations between common developmental delays teachers perceived to be indicative of reading difficulties, and whether or not they perceived occupational therapy to be beneficial for reading delays.

Data determined no statistically significant association between level of concern for visual-spatial/perceptual deficits, behavioral problems, phonological awareness deficits, vocabulary deficits, comprehension deficits, letter and word recognition deficits, motor developmental delays, and phonics deficits (Question 4) as indicators for reading difficulties and Question 13.

Table 9

Question 4 - Developmental Delays and Question 13 Crosstabulation

| Developmental Delays | Pearson Chi Square | P-value |
|------------------------------------|--------------------|---------|
| Visual-spatial/perceptual deficits | 4.197 | .123 |
| Behavior problems | .815 | .665 |
| Phonological awareness deficits | .493 | .781 |
| Vocabulary delays | 4.484 | .196 |
| Comprehension delays | 3.259 | .196 |
| Letter and word recognition | 1.006 | .605 |
| Motor developmental delays | 1.051 | .591 |
| Phonics deficits | .961 | .619 |

Analysis determined a statistically significant association (Pearson Chi Square 6.442, p-value .040) between teacher perception of handwriting delays as an indicator for reading difficulties (Question Four) and Question 13. There was a weak positive correlation (Spearman correlation .215) between the two variables.

Table 10

Question 4 - Handwriting Delays and Question 13 Crosstabulation

| | | Question 13 | | | Total |
|--------------------------|-----|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | |
| Question 4 - Handwriting | No | 3 | 7 | 13 | 23 |
| | Yes | 0 | 11 | 32 | 43 |
| Total | | 3 | 18 | 45 | 66 |

Analysis determined a statistically significant association (Pearson Chi Square 9.985, p-value .007) between teacher perception of language delays as an indicator for reading difficulties (Question 4) and Question 13. There was a weak positive correlation (Spearman correlation .283) between the two variables.

Table 11

Question 4 -Language Delays and Question 13 Crosstabulation

| | | Question 13 | | | Total |
|-----------------------|-----|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | |
| Question 4 - Language | No | 2 | 3 | 3 | 8 |
| | Yes | 1 | 15 | 42 | 58 |
| Total | | 3 | 18 | 45 | 66 |

Data determined no statistically significant association (Pearson Chi Square 9.264, p-value .055) between familiarity with the link between handwriting difficulties and reading delays (Question 5) and Question 13. There was a relatively weak positive correlation (Spearman correlation .258). between the two variables.

Table 12

Question 5 and Question 13 Crosstabulation

| | Question 13 | | | Total |
|--------------------------------|-------------|---|-----|-------|
| | No | Yes, but as an intervention for another concern | Yes | |
| Question 5 Not at all familiar | 2 | 4 | 9 | 15 |
| Somewhat familiar | 1 | 14 | 25 | 40 |
| Very familiar | 0 | 0 | 11 | 11 |
| Total | 3 | 18 | 45 | 66 |

There was no statistically significant association (Pearson Chi Square 3.366, p-value .762) between how many students can read proficiently in the participant's classroom (Question 6) and Question 13.

Data determined no statistically significant association (Pearson Chi Square .735, p-value .947) between how many of the participant's students had IEPs for reading prior to the start of the year (Question 7) and Question 13.

Data showed no statistically significant association (Pearson Chi Square 2.958, p-value .814) between percentage of students with IEPs for other concerns (Question 8) and Question 13.

Data showed no statistically significant association (Pearson Chi Square 1.685, p-value .793) between how familiar participants were with the RTI Model (Question 10) and Question 13.

Table 13

Question 10 and Question 13 Crosstabulation

| | | Question 13 | | | |
|-------------|---------------------|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | Total |
| Question 10 | Not at all familiar | 0 | 4 | 6 | 10 |
| | Somewhat familiar | 1 | 7 | 19 | 27 |
| | Very familiar | 2 | 7 | 20 | 29 |
| Total | | 3 | 18 | 45 | 66 |

Analysis determined no statistically significant association (Pearson Chi Square 2.699, p-value .609) between whether or not participants knew if other therapies were available in the RTI model (Question 11) and Question 13.

Table 14

Question 11 and Question 13 Crosstabulation

| | | Question 13 | | | |
|-------------|----|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | Total |
| Question 11 | No | 0 | 3 | 11 | 14 |

| | | | | | |
|-------|----------|---|----|----|----|
| | Not sure | 2 | 10 | 17 | 29 |
| | Yes | 1 | 5 | 17 | 23 |
| Total | | 3 | 18 | 45 | 66 |

Data showed no statistically significant association (Pearson Chi Square 3.234, p-value .519) between whether or not participants knew if occupational therapy services were available within their school's RTI model (Question 12) and Question 13.

Analysis determined no statistically significant association (Pearson Chi Square 12.449, p-value .200) between grade taught (Question 14) and Question 13.

Data showed no statistically significant association (Pearson Chi Square 7.007, p-value .536) between years of teaching (Question 15) and Question 13.

Table 15

Question 15 and Question 13 Crosstabulation

| | | Question 13 | | | |
|-------------|------------------|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | Total |
| Question 15 | Less than 1 year | 0 | 1 | 7 | 8 |
| | 1-5 years | 0 | 1 | 3 | 4 |
| | 6-10 years | 1 | 3 | 4 | 8 |
| | 11-15 years | 1 | 6 | 6 | 13 |
| | 15+ years | 1 | 7 | 24 | 32 |
| Total | | 3 | 18 | 44 | 65 |

Analysis determined no statistically significant association (Pearson Chi Square .804, p-value .669) between level of education (Question 16) and Question 13.

Table 16

Question 16 and Question 13 Crosstabulation

| | | Question 13 | | | Total |
|-------------|-----------|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | |
| Question 16 | Bachelors | 1 | 4 | 10 | 15 |
| | Masters | 1 | 10 | 29 | 40 |
| | Higher | 1 | 4 | 6 | 11 |
| Total | | 3 | 18 | 45 | 66 |

Data showed no statistically significant association (Pearson Chi Square 1.350, p-value .969) between favorite subject to teach (Question 17) and Question 13.

Analysis determined a statistically significant association (Pearson Chi Square 27.840, p-value .002) between ethnicity of students (Question 18) and Question 13.

Table 17

Question 18 and Question 13 Crosstabulation

| | | Question 13 | | | Total |
|--|--|-------------|---|-----|-------|
| | | Not | Yes, but as an intervention for another concern | Yes | |
| | | | | | |

| | | | | | |
|-------------|------------------|---|----|----|----|
| Question 18 | Caucasian | 1 | 27 | 11 | 39 |
| | Heterogenous | 0 | 7 | 5 | 12 |
| | African American | 1 | 4 | 2 | 7 |
| | Hispanic | 0 | 5 | 0 | 5 |
| | Asian | 0 | 2 | 0 | 2 |
| | Other | 1 | 0 | 0 | 1 |
| Total | | 3 | 45 | 18 | 66 |

Discussion

Results indicate familiarity and perception of the importance of occupational therapy did not influence familiarity with occupational therapy services available within the RTI model. There was a statistically significant association between familiarity with the RTI model and whether or not occupational therapy services were available. There was a strong positive correlation between knowledge of other therapies in the RTI model and knowledge of occupational therapy services available in the RTI mode. These results indicate familiarity with the RTI model and other therapies available was more important than familiarity and perception of the importance of occupational therapy in determining if occupational therapy services were available within the RTI model.

Second grade teachers were most familiar with occupational therapy services available within the RTI model as compared to the other grades, which may indicate some connection to increased attention to reading delays as reported in the literature, but the survey cannot assess this connection (Kjeldsen, 2019). Participants with higher levels of education were most familiar with the availability of occupational therapy services within the RTI model. Responses indicated

participants with 11-15+ years of teaching experience were least familiar with occupational therapy services available within the RTI model. Thus, results indicate level of education is more important than years of teaching for knowledge of occupational therapy services available within the RTI model. Data suggests further investigation as to why the RTI model is recognized least by teachers with 11-15+ years of experience is warranted.

Results indicate familiarity and perception of importance of occupational therapy does not correlate to perception of occupational therapy as a beneficial intervention for reading delays within the RTI model. Analysis determined a statistically significant association between level of concern for reading delays and perception of occupational therapy as an intervention for reading delays within the RTI model. Participants who were *somewhat concerned*, *very concerned*, or *very familiar* with the link between handwriting and reading perceived occupational therapy as a beneficial intervention for reading delays more than those who were less concerned and less familiar with the link. Results may indicate a connection between teacher knowledge and literature supporting the link between handwriting delays and reading delays, but the survey cannot assess this for certain (Gerde, 2014). Data indicates concern for reading delays was more important for perception of occupational therapy as an intervention for reading within the RTI model, not level of familiarity or importance of occupational therapy, or familiarity with handwriting and reading delays. Results suggest more familiarity and a better understanding of occupational therapy as an intervention for reading delays may be beneficial, as well as more education regarding the link between handwriting and reading delays.

Results suggest a general understanding of developmental delays indicative of reading difficulties. There was less of an association between motor developmental delays, behavior problems, vocabulary delays, handwriting delays, and reading delays and perception of the

benefits of occupational therapy as an intervention for reading delays in the RTI model (Bellocchi, 2017; Cabell, 2008; Handley-Moore, 2015). Further investigation into which developmental delays teachers are least familiar with may be warranted.

Results indicate percentage of students with IEPs or reading difficulties did not influence participant perception of occupational therapy as an intervention for reading delays. Further investigation regarding interventions for reading delays and approaches for students with IEPs may be warranted. Results suggest regardless of familiarity with the RTI model or knowledge of other therapies available within the RTI model, participants perceived occupational therapy as a beneficial intervention for reading delays. In addition, most participants reported not knowing if occupational therapy was available within their school's RTI model but perceived it as a beneficial intervention for reading delays within the RTI model. Results suggest teachers perceived occupational therapy as a beneficial intervention for reading delays within the RTI model regardless of familiarity with the model, knowledge of other therapies available, or knowledge of occupational therapy services available (Bellocchi, 2017; Cabell, 2008; Handley-Moore, 2015). Data indicates more education regarding availability and applicability of occupational therapy services may be beneficial.

Second, third, and fourth grade teachers perceived occupational therapy as beneficial for reading delays within the RTI model more than kindergarten, first, and fifth grade teachers. Although second grade teachers were most familiar with occupational therapy services available, results suggest more emphasis on occupational therapy as a reading intervention and the importance of reading interventions prior to third grade may be beneficial (Kjeldsen, 2019).

Although responses indicate participants with 11-15+ years of teaching experience were least familiar with occupational therapy services available within the RTI model, the longer the

participants have been teaching, the more likely they were to perceive occupational therapy as a beneficial intervention for reading delays. This participant group may be unfamiliar with the availability of resources and thus less likely to refer students for occupational therapy interventions. This research suggests more education regarding availability of services for this participant group may be most beneficial. Although those who answered *higher* for education level were more likely to know if occupational therapy services were available, those with a master's degree perceived occupational therapy as beneficial for reading delays most. Results suggest higher education level was more important for knowledge of availability of occupational therapy services, but not perception of the benefits of occupational therapy. Overall, results suggest a general lack of knowledge and familiarity with occupational therapy services available and the benefits of occupational therapy interventions.

Implications for Occupational Therapy Practice

This study has the following implications for occupational therapy practice:

- Higher concern for reading delays may influence teacher perception of the benefits of occupational therapy for reading delays
- Lack of knowledge regarding occupational therapy services available within individual school's may be affecting student referral
- More emphasis on the importance and benefits of occupational therapy as an intervention for reading delays for younger grades
- Further education regarding developmental delays indicative of reading difficulties

- Sample pool suggests teachers perceive occupational therapy as a potentially beneficial addition to the RTI model for reading delays
- Further research is required regarding teacher perception of occupational therapy as an intervention for reading delays
- Further education and training for teachers regarding the connection between handwriting delays and reading difficulties

Study Limitations

This study has several limitations potentially affecting interpretation of results. The study was a preliminary study regarding teacher perception of the benefits of occupational therapy as an intervention in the RTI model. The study utilized a convenience and snowball sampling approach. Recruitment strategy required revision due to lack of survey responses. No definitions were provided for answer options (Ex. *Somewhat familiar, somewhat concerned, somewhat important*). Participants who answered *other* for survey questions were not provided an open-ended response option to clarify answer. The answer option *not sure* affected ability to interpret results since it was coded and interpreted as a middle ground between *no* and *yes*. One question regarding developmental delays required individual coding due to question wording. Participants may have been hesitant to answer questions admitting they were not familiar with survey questions or topics honestly.

Different terms for RTI model (ex. Tiers, levels, etc.) may be used in different schools, affecting general understanding of concepts. Some participants did not answer all questions, absence of an answer was interpreted as a communication or terminology issue. There were limited demographic differences between participants and schools. Most participants had a

master's degree, favorite subject to teach was math, and student population was mostly Caucasian. No additional demographic questions were added to clarify whether or not participants were retired or active elementary school teachers. Different schools may have different policies regarding implementation of the RTI model. Study did not include a demographic question identifying type of school participants taught in.

Future Research

This was a preliminary study regarding teacher perception of occupational therapy in the RTI model for reading delays. Additional research is needed to determine statistical significance and eliminate study limitations. Additional research is needed to determine statistically significant association between grades teacher taught and connection to interventions for reading delays prior to third grade. Further investigation is needed to determine why teachers with 11-15+ years of experience were least familiar with the RTI model. In addition, further research is needed to determine if familiarity with the connection between handwriting difficulties and reading delays influences teacher perception of the benefits of occupational therapy for reading delays. Additional research regarding teacher understanding and level of awareness for different developmental delays associated with reading difficulties is needed. Additional research is needed to determine if there is a statistically significant association between percentage of students with IEPs or 504 plans or percentage of students who can read proficiently and teacher perception of the benefits of occupational therapy as a reading delay intervention. A more qualitative approach may be beneficial to understand the concepts and ideas regarding teacher perceptions of occupational therapy in the RTI model for reading delays.

Conclusion

This preliminary study explored teacher perception of the benefits of occupational therapy as an intervention for reading delays within the RTI model. Familiarity of the RTI model and other therapies available was more important in determining if occupational therapy services were available within the RTI model. Concern for reading delays was more important than handwriting delays for perception of occupational therapy as an intervention for reading within the RTI model. Although most participants were unaware if occupational therapy was available within their school's RTI model, a majority of participants perceived occupational therapy as a beneficial intervention for reading delays within the RTI model. Participants with 11-15+ years of teaching experience were least familiar with occupational therapy services available within the RTI model, however, the more years of experience, the more they perceived occupational therapy as a beneficial intervention for reading delays. Participants who answered *higher* for education level were more familiar with available occupational therapy services in the RTI model, but more participants with a master's degree perceived occupational therapy as beneficial for reading delays. Overall, this study indicated a positive perception of the benefits of occupational therapy as an intervention for reading delays within the RTI model

Appendix A

1. How familiar are you with occupational therapy?
 - a. 65.7% were *somewhat familiar* and 34.3% were *very familiar*

2. How important do you perceive occupational therapy to be as an intervention for students?
 - a. 6% perceived occupational therapy as *somewhat important* and 94% perceived occupational therapy as *very important*

3. Which of the following is the most common concern you refer students to occupational therapy services for? Please rank *from not at all concerned, somewhat concerned, or extremely concerned*
 - a. Handwriting: 44.8% were *somewhat concerned* and 55.2% were *extremely concerned*

 - b. Disruptive classroom behavior: 20.9% were *not at all concerned*, 43.3% were *somewhat concerned*, and 35.8% were *extremely concerned*

 - c. Autism: 7.7% were *not at all concerned*, 32.3% were *somewhat concerned*, and 60% were *extremely concerned*

 - d. ADHD: 9% were *not at all concerned*, 43.3% were *somewhat concerned*, 47.8% were *extremely concerned*

 - e. Reading: 18.2% were *not at all concerned*, 53% were *somewhat concerned*, 28.8% were *extremely concerned*

- f. Other: 26.7% were *not at all concerned*, 58.3% were *somewhat concerned*, and 15% were *extremely concerned*
4. What are some developmental delays you look for to determine if a child is experiencing reading difficulties? Check all that apply
 - a. 52 participants checked visual-spatial/perceptual deficits
 - b. 39 participants checked behavior
 - c. 44 participants checked handwriting
 - d. 59 participants checked language delays
 - e. 59 participants checked phonological awareness deficits
 - f. 44 participants checked vocabulary delays
 - g. 49 participants checked comprehension delays
 - h. 57 participants checked letter and word recognition delays
 - i. 35 participants checked motor development delays
 - j. 52 participants checked phonics deficits
5. How familiar are you with the link between handwriting difficulties and reading delays?
 - a. 22.4% were *not at all familiar*, 61.2% were *somewhat familiar*, and 16.4% were *very familiar*
6. What percentage of students in your classroom can read proficiently at grade level?

- a. 5 participants reported *1-25%*, 8 reported *26-50%*, 31 reported *51-75%*, and 22 reported *76%+*
7. What percentage of students who had an IEP or 504 plans for READING (not including written expression) PRIOR to the grade you teach?
 - a. 54 participants reported *1-25%*, 8 reported *26-50%*, 0 reported *51-75%*, and 3 reported *76%+*
 8. What percentage of students in your class have IEPs or 504 plans in your classroom for diagnosis OTHER THAN reading?
 - a. 55 participants reported *1-25%*, 7 reported *26-50%*, 1 reported *51-75%*, and 3 reported *76%+*
 9. Within your school district, can students receive occupational therapy services prior to being identified for an IEP or 504 plans? Meaning do children have access to occupational therapy services without IEPs or 504 plans?
 - a. 11 participants reported *yes*, 35 reported *no*, and 21 reported *not sure*
 10. How familiar are you with the Response to Intervention model?
 - a. 16.4% were *not at all familiar*, 40.3% were *somewhat familiar*, and 43.3% were *very familiar*
 11. Is your school utilizing the Response to Intervention model for different therapies?
 - a. 23 participants reported *yes*, 14 reported *no*, and 30 reported *not sure*

12. Are occupational therapy services available to student in the different Response to Intervention piers?

- a. 17 participants reported *yes*, 11 reported *no*, and 39 reported *not sure*

13. Do you think occupational therapy would be a beneficial addition to the Response to Intervention model for students with READING DELAYS? (Not including written expression)

- a. 45 participants reported *yes*, 3 reported *no*, and 18 reported *yes, but as an intervention for another concern*

Demographics:

14. What grade do you teach?:

- a. 9 participants reported teaching *kindergarten*, 12 reported *1st grade*, 8 reported *2nd grade*, 11 reported *3rd grade*, 9 reported *4th grade*, and 13 reported *5th grade*

15. How long have you been teaching?

- a. 8 participants reported teaching for *less than 1 year*, 4 reported teaching for *1-5 years*, 8 reported teaching for *6-10 years*, 13 reported teaching for *11-15 years*, and 33 reported teaching for *15+ years*

16. What level of schooling have you received?

- a. 0 participants reported earning an *associate's* level of education, 15 reported a *bachelor's* level of education, 41 reported a *master's* level of education, and 11 reported a *higher* level of education

17. Favorite subject to teach?

- a. 24 reported *math*, 19 reported *language arts*, 7 reported *science*, 6 reported *social studies*, 1 reported *art*, 1 reported *music*, and 8 reported *reading*

18. Ethnicity of the majority of students in your classroom

- a. 7 reported *African American*, 5 reported *Hispanic*, 2 reported *Asian*, 0 reported *Latino*, 40 reported *Caucasian*, 12 reported *Heterogeneous*, and 1 reported *other*

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