2019

Primary Teachers' Knowledge and Beliefs as Predictors of Intention to Provide Evidence-Based Reading Instruction

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MS, Walden University, 2014

BA, University of Montana, Missoula, 1999

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

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Abstract

Primary teachers in the United States accept responsibility for teaching children how to read, and the instruction they provide results in reading proficiency for approximately 37% of students. Although researchers have established a relationship between teacher-related factors and students' performance in reading, they have not yet been able to identify the combination of teacher characteristics that best predicts teachers' intention to provide evidence-based reading instruction. The purpose of this study was to examine the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction using a conceptual framework that integrated the theory of planned behavior with the implicit theory of intelligence. An online survey was used to gather data from a convenience sample of 37 primary teachers in the United States to examine characteristics effective reading teachers have in common. The results of multiple regression analysis indicated different patterns for different groups of readers. For beginning readers, teachers' behavioral beliefs was the only significant predictor of intention to provide evidence-based reading instruction. For struggling readers, teacher knowledge of reading disabilities was the only significant predictor of intention. This study provided additional evidence of deficits in teachers' knowledge of basic language concepts and reading disabilities. Identifying teacher characteristics that influence students' reading proficiency outcomes may inform efforts to improve professional development and teacher preparation programs to better support and prepare teachers to ensure successful reading outcomes for all children.

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Dedication

Dedicated to my parents, Roni and Jerry Harrold, to whom I am forever grateful for empowering me to know. In their unique ways, each gave me tools and ways of thinking to answer my questions about the world around me, and in doing so nurtured the making of a true scientist.

Acknowledgments

The process of writing a dissertation has been the most significant academic challenge I have faced, and I would like to take this opportunity to acknowledge those who have contributed to my success.

First, I would like to express appreciation to my committee, Dr. Rachel Moore (chair) and Dr. John Agnew (committee member), for giving me the autonomy to embrace my journey as the ultimate learning opportunity while always stepping in when needed to provide insightful suggestions and valuable feedback. I also want to thank Dr. Rolande Murray for serving as my university research reviewer and offering helpful comments during the review process.

Next, I would like to recognize Marcus Tomek for his unwavering belief in my ability to succeed and his steady encouragement.

Finally, since the beginning of this journey, my sister Mycah has been my rock. From reviewing countless drafts, to challenging and enriching my thinking, to providing moral support and encouragement, to commiserating about the trials and tribulations faced by Ph.D. students, she has been there for me. I am truly grateful for her presence in my life and for the opportunity to experience the dissertation journey alongside her.

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Chapter 1: Introduction to the Study

Introduction

In U.S. society, primary teachers accept responsibility for teaching children how to read, a skill fundamental to personal, academic, and professional achievement. Extensive research efforts spanning decades have addressed multiple aspects of reading (Allington, 2013; Castles, Rastle, & Nation, 2018). Researchers have compiled comprehensive empirical evidence mapping the process of reading acquisition (Seidenberg, 2013) and have established consensus on the instructional practices most useful for beginning and struggling readers (Reddy, Fabiano, Dudek, & Hsu, 2013). Multiple lines of research, however, indicated that most primary teachers in the United States have not mastered or used this body of knowledge to inform their reading instruction (Kuzborska, 2011; Piasta, Connor, Fishman, & Morrison, 2009; Seidenberg, 2013). Researchers have yet to document the personal characteristics effective reading teachers have in common (Cunningham, Zibulsky, Stanovich, & Stanovich, 2009). The present study was designed to provide a unique contribution by integrating two established theories to examine multiple teacher-related factors as predictors of intention to provide evidence-based reading instruction.

Pervasive and persistent rates of reading failure in the United States suggest a level of ineffectiveness in the educational system (Kraut, Chandler, & Hertenstein, 2016; Seidenberg, 2013). Teachers play one of the most influential roles in this system, influencing students' reading acquisition outcomes and overall academic achievement (Guarino, Buddin, Pham, & Cho, 2010). Understanding the teacher-related factors that

contribute to the use of more effective instructional practices can inform scholars' and practitioners' efforts to improve teacher training and professional development so that teachers are better prepared to meet the instructional needs of all children learning to read (Hagan-Burke et al., 2013).

In this chapter, I provide an introduction to the current study and identify key decisions I made when designing the study. First, I summarize current and relevant research to provide context and background. Then, I articulate the research problem, the purpose of this study, and the research question and hypotheses. Next, I describe how combining the theory of planned behavior with the implicit theory of intelligence into a conceptual framework grounded this project. After that, I clarify the nature of the study and definitions of variables and terms, as well as the assumptions, scope, and limitations of the study. I close this chapter by suggesting contributions to social change and other implications of this study.

Background

To provide background for the present study, I briefly summarize the extant literature related to reading acquisition, reading instruction, reading disabilities, teacher knowledge, and teacher beliefs. Scientists have made great strides in understanding reading acquisition as well as the symptoms, diagnosis, and treatment of reading difficulties (Seidenberg, 2013). Researchers have also documented instructional practices most productive for beginning and struggling readers (Reddy et al., 2013) and have provided guidance in the form of reports that translate research into practical advice for effective reading instruction (Duke & Block, 2012). Although many factors have been

shown to influence instructional decision-making and the effectiveness of reading instruction, this study was limited to examination of two specific teacher-related factors: knowledge and beliefs.

Reading Acquisition

A wealth of empirical evidence has led to a consensus among scientists and educators as to the viability of the theory of a simple view of reading in explaining how the brain processes information during reading tasks (Gough, 1996). According to this theory, reading involves two levels of processing: The lower level is called decoding, and the higher level is known as comprehension (Compton, Miller, Elleman, & Steacy, 2014). Over the course of the reading acquisition process, the relationship between decoding and comprehension shifts (Spear-Swerling, Lopes, Oliveira, & Zibulsky, 2016).

Initially, most cognitive resources are devoted to decoding as beginning readers focus on sounding out and recognizing the words on the page. Students must first develop an understanding of decoding, or how speech maps to print because it allows them to recognize individual words based on knowledge of letter names and sounds. A child looking at the letters *c a t* on the page of a book laboriously blending the sounds /c/ /a/ /t/ to read the word *cat* demonstrates emerging skill in decoding. Successful decoding requires mastery of both phonological awareness and phonics. Phonological awareness is the understanding that speech is made up of individual units of sound (called phonemes), whereas the idea that the written letters in words represent these phonemes is known as the alphabetic principle or phonics (Lyon, Shaywitz, & Shaywitz, 2003; McCutchen,

Green, Abbott, & Sanders, 2009; Snowling, 1998; Vernon-Feagans et al., 2010). Although essential, decoding is not sufficient by itself for success in reading.

As decoding becomes automatic, greater cognitive resources can be allocated to comprehension, the ultimate goal of reading. Proficient readers are skilled in accurate and automatic decoding as well as processing the content and understanding the implications of what is read (Joshi, 2003; Meisinger, Bradley, Schwanenflugel, Kuhn, & Morris, 2009). Comprehension, or the ability to make meaning from written text (Torgeson, 2000), depends on many factors including vocabulary and fluency (Roskos & Neuman, 2014; Seidenberg, 2013). *Vocabulary* refers to the set of words a student recognizes, understands, or uses when speaking or reading. Students who have an extensive vocabulary are more likely to comprehend most of the words they read in a given passage and grasp the overall meaning of that passage (Pullen, Tuckwiller, Ashworth, Lovelace, & Cash, 2011). Fluent readers recognize words automatically, allowing them to read text accurately and quickly and focus on constructing meaning from what they read. Fluency acts as a bridge between recognizing written words and understanding their meaning (Armbruster, Lehr, Osborn, & Adler, 2009). Research indicated beginning and struggling readers benefit from instruction that defines and describes aspects of both decoding and comprehension and provides ample opportunities to apply knowledge to increase reading proficiency (Washburn, Binks-Cantrell, Joshi, Martin-Chang, & Arrow, 2016).

Reading Instruction

Reading, unlike listening and speaking, is not an innate ability (Carvalhais & da Silva, 2010; Seidenberg, 2013; Stark, Snow, Eadie, & Goldfeld, 2016), and it often

requires years of formal instruction to achieve mastery (Olson, Keenan, Byrne, & Samuelsson, 2014). Most academic instruction in the primary grades is directed at reading acquisition (Meisinger et al., 2009; Stark et al., 2016). The overarching goal of reading instruction is to provide children with opportunities to develop the knowledge and skills they need to comprehend printed language at the same level they understand spoken language (Torgeson, 2000). Belying the simplicity of this goal is the complexity of reading acquisition and instruction (Gallant & Schwartz, 2009).

To be most productive, researchers have determined that reading instruction should be explicit (Joshi et al., 2009), systematic (Duke & Block, 2012), and sequential (Leko, Kulkarni, Lin, & Smith, 2015; Washburn, Joshi, & Cantrell, 2011). Furthermore, it must address each of five key components: phonemic awareness, phonics, fluency, vocabulary, and text comprehension (Podhajski, Mather, Nathan, & Sammons, 2009; Washburn, Binks-Cantrell, et al., 2016; Washburn, Joshi, & Binks-Cantrell, 2011). Primary teachers who provide this type of reading instruction have the power to help all students achieve successful reading proficiency outcomes (Piasta et al., 2009).

Reading Disabilities

In schools across the United States, approximately 13% of school-age children qualify for special education services (McFarland et al., 2018). Of these students, close to 80% receive services for reading (Joseph, Wargelin, & Ayoub, 2016; Lyon et al., 2003; Ness & Southall, 2010) making reading disabilities the most prevalent learning disability (Compton et al., 2014). There is overwhelming research evidence, including that from brain imaging technology, supporting the neurological basis of reading disabilities

(Soriano-Ferrer & Echegaray-Bengoa, 2014). In addition to genetics, factors that have been shown to influence reading acquisition include quality (Hagan-Burke et al., 2013) and content of instruction (Moats, 2009b) as well as exposure to oral language (Hart & Risley, 1995).

The fluctuating relationship between lower-level and higher-level reading processes allows for three primary subtypes of reading disabilities: decoding difficulties, comprehension problems, or decoding and comprehension issues together (Compton et al., 2014; Spear-Swerling et al., 2016). Typically, children who experience difficulty during the first few years of formal reading instruction do so in the area of decoding (Washburn, Joshi, & Cantrell, 2011) where deficits in phonemic awareness inhibit processing of the phonological features of words (Torgesen, 2000; Washburn, Joshi, & Binks-Cantrell, 2011). If these initial difficulties are not recognized and addressed appropriately, decoding deficits are likely to persist and often result in difficulty with comprehension (Lembke, McMaster, & Stecker, 2010). Far fewer students demonstrate comprehension problems in the absence of trouble with decoding (Compton et al., 2014), and these students are characterized by their ability to efficiently and accurately decode words without understanding the meaning of what they read (Meisinger et al., 2009).

Early identification of reading difficulties and timely intervention that addresses deficits in foundational literacy skills have the potential to eliminate reading failure (Callinan, Cunningham, & Theiler, 2013; Lembke et al., 2010; Lyon et al., 2003; Rainwater-Lawler & Yumori, 2010; Snowling, 1998; Soriano-Ferrer & Echegaray-Bengoa, 2014; Vlach & Burcie, 2010; Vellutino, Scanlon, Small, & Fanuele, 2006;

Washburn, Joshi, & Binks-Cantrell, 2011). Assessing children's performance on phonological awareness tasks and letter knowledge can identify those at risk for experiencing difficulties with reading acquisition (Snowling, 1998), and it is possible to do so as early as preschool (Dunn, 2007; Vellutino et al., 2006).

Once at-risk students are identified, intervention efforts should match the student's unique deficits and current skill level (Aaron, Joshi, Gooden, & Bentum, 2008). Empirical evidence supports the use of multisensory, structured language intervention programs (Griffiths & Stuart, 2013; Joshi et al., 2009) because they provide systematic and explicit instruction in how to read printed words accurately and fluently (Wadlington & Wadlington, 2005) as well as comprehend written text (Torgeson, 2000). Byrne et al. (2010) found that teachers using research-based interventions could positively affect students' achievement. Likewise, Vernon-Feagans et al. (2010) found that classroom teachers could produce reading gains in struggling readers. In an earlier study, research-based early interventions reduced the expected incidence of reading failure among school-age children from 18% to approximately 4% (Torgeson, 2000).

Current reading proficiency rates for fourth graders in the United States may be surprising in light of all that researchers have learned about reading, reading disabilities, and effective reading instruction. However, scientists have also documented a research-to-practice gap in the education field and, more specifically, in reading instruction that may contribute to this trend. Most primary teachers in the United States do not provide reading instruction informed by and consistent with recommendations from current research (Davidson, 2013; Spear-Swerling et al., 2016). Determining the causes of this

research-to-practice gap was beyond the scope of the present study, and I focused instead on examining the influence of two teacher-related factors (knowledge and beliefs) on intention to provide evidence-based reading instruction.

Teacher Knowledge

Having the ability to read does not automatically qualify someone to teach others to do so (McCutchen, Harry, et al., 2002). Successful reading teachers must demonstrate expertise in numerous areas (Joshi, 2003) including the content of effective reading instruction as well as instructional strategies that help students access, understand, and retain the content (Allington, 2013). Also, teachers must be able to recognize students who struggle with any aspect of reading and provide specific, research-based interventions (Williams & Lynch, 2010).

Language and reading. To provide effective reading instruction, teachers need a profound depth of profession-specific (Kunter et al., 2013) and explicit (McCutchen et al., 2009) knowledge that is recent, accurate, and research based (Sciuchetti, McKenna, & Flower, 2016; Washburn, Binks-Cantrell, & Joshi, 2014; Washburn, Joshi, & Binks-Cantrell, 2011). Teachers of reading must have explicit knowledge of basic language concepts (Podhajski et al., 2009), understanding of how distinct language components work together (Lyon & Weiser, 2009), and awareness of the developmental progression of both language and reading acquisition (McCutchen, Abbott, et al., 2002).

Providing explicit reading instruction requires teachers to go beyond the implicit knowledge and skill they use when reading to develop explicit knowledge of phonology, phonics, morphology (Moats, 1999; Washburn, Joshi, & Binks-Cantrell, 2011;

Washburn, Joshi, & Cantrell, 2011). Not only do teachers need to understand these concepts, but they must also be able to apply their knowledge and successfully transmit it to their students (McMahan, Oslund, & Odegard, 2019; Oliveira, Lopes, & Spear-Swerling, 2019). To that end, teachers should demonstrate working knowledge of common terms including phonics and phonology, fluency, vocabulary, and comprehension and the relationships between these features of reading (Lyon & Weiser, 2009). Teachers also need to understand that speech maps to print and demonstrate skill in analyzing speech independent of written text (Moats, 2009b).

Reading disabilities. Many students with reading disabilities remain in general education classrooms (Davidson, 2013). Therefore, all teachers need to have sufficient working knowledge of reading disabilities if they are to provide quality instruction for all of their students. Furthermore, they must understand the importance of early identification of and interventions for struggling readers (Wadlington & Wadlington, 2005; Washburn, Joshi, & Binks-Cantrell, 2011) and be able to intervene effectively as soon as a student begins to struggle with any aspect of the reading process (Vernon-Feagans et al., 2010; Washburn et al., 2014).

Primary teachers who have a solid understanding of reading instruction can prevent reading failure (Joshi et al., 2009; Washburn, Joshi, & Binks-Cantrell, 2011). Teacher preparation programs often do not provide extensive training in the characteristics, causes, diagnosis, and intervention strategies for reading disabilities (Seidenberg, 2013). The resulting lack of understanding among teachers and administrators can lead to ineffective identification, instruction, intervention, and

accommodations for beginning and struggling readers, which contributes to reading failure (Snow et al., 1998).

Teacher Beliefs

Teachers' beliefs about themselves and their students influence their level of professional commitment and selection of instructional practices, which in turn impacts students' academic outcomes (Gibbs & Powell, 2012; Hornstra, Denessen, Bakker, van der Bergh, & Voeten, 2010). Moreover, teachers' perceptions of the role they play and the responsibilities inherent in this role are influenced by their beliefs (Kumar, Karabenick, & Burgoon, 2015).

In the context of beginning or struggling readers, teachers' beliefs about the students they teach and the expected consequences of using a particular instructional strategy impact the instructional decisions they make (Gwernan-Jones & Burden, 2009) and the expectations they hold for student performance (Hall, 2009). Also, what teachers believe about parents' and principals' expectations of the role they play in reading instruction and achievement influences the content of and approach to reading instruction (Ruppar, Gaffney, & Dymond, 2015). Teachers' perceived level of control over decision-making related to the selection and implementation of particular strategies also impacts their reading instruction (Wijekumar, Beerwinkle, Graham, & Harris, 2019). Teachers' beliefs about students' capacity to learn affect how teachers approach instruction and intervention (Egloff, Förster, & Souvignier, 2019). Successful reading instruction involves both a teacher and a student, and teachers' beliefs about students' ability to learn are as important as teachers' beliefs about their capacity to teach students.

Researchers have documented the process students go through as they acquire the ability to read and the format and content of instruction that is most effective in helping students overcome difficulties they might experience during this process. Nevertheless, most students do not receive reading instruction from researchers and depend on their teachers to be aware of and use this knowledge to inform their reading instruction. However, research findings, including current and historical reading proficiency rates, indicated that the reading instruction many teachers provide does not reflect what researchers know (Kuzborska, 2011; Seidenberg, 2013), and researchers have not adequately examined the factors that contribute to this research-to-practice gap (McMahan et al., 2019). A better understanding of the role of teacher-related factors in instructional decision-making (Holzberger, Philipp, & Kunter, 2013) and decisions related to the use of evidence-based reading instruction may be the key to addressing and overcoming the widespread reading failure in the United States.

Problem Statement

According to recent reports, U.S. fourth-grade reading proficiency rates hover around 37% (McFarland et al., 2018), representing only a slight increase over the past 25 years. Close to two thirds of students are not proficient readers by the end of the traditional period of reading instruction. For the millions of students in the United States who do not acquire reading proficiency by the time they leave third grade, the implications are staggering. Approximately 16% of students who fail to accomplish this reading milestone do not graduate from high school, compared to the 4% of proficient readers who do not graduate (Annie E. Casey Foundation, 2011). Taking into account

reduced productivity, lost earnings, and related taxes, the financial burden on society attributed to each high school dropout throughout his or her lifetime is estimated at $260,000 (Fiester, 2012). Furthermore, students who cannot read are at increased risk for underemployment or unemployment (Ise et al., 2010), entry into the criminal justice system (Guo, Connor, Yang, Roehrig, & Morison, 2012; Wadlington & Wadlington, 2005), and mental health disorders (Whitehouse, Spector, & Cherkas, 2008).

Much is known about reading and reading instruction (Allington, 2013). Researchers have identified the developmental progression of the reading acquisition process (Seidenberg, 2013) as well as the instructional practices that best support this process (Reddy et al., 2013) and have made recommendations for teachers (Cunningham et al., 2009). However, 63% of fourth graders in the United States do not read at a proficient level, suggesting that primary teachers are not providing reading instruction consistent with these recommendations (Sciuchetti et al., 2016; Washburn, Joshi, & Binks-Cantrell, 2011). Although this research-to-practice gap is well documented, researchers have yet to understand the factors that influence teachers' decisions to provide evidence-based instruction with beginning and struggling readers. The present study addressed this gap in the literature through examination of the relationships among a variety of teacher-related factors and teachers' intention to provide evidence-based reading instruction using a conceptual framework that integrated two established and relevant theories.

Purpose of the Study

The purpose of this quantitative, correlational study was to examine the predictive relationship between teacher-related factors and intention to provide evidence-based reading instruction using a conceptual framework that integrated the theory of planned behavior and implicit theory of intelligence. Teacher-related factors were the independent variables and included teacher knowledge (of basic language concepts and reading disabilities) and teacher beliefs. The dependent variable was intention to provide evidence-based reading instruction.

Research Question and Hypotheses

I was interested in learning about the characteristics effective teachers might have in common and posed the following research question: What are the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction?

H_o1: There is not a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia Scale, and teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_a1: There is a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and

Beliefs about Developmental Dyslexia Scale, and teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_o2: There is not a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia Scale, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_a2: There is a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia Scale, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_o3: There is not a predictive relationship between teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_a3: There is a predictive relationship between teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional

Intentions survey, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

Conceptual Framework

I used a conceptual framework that blended the theory of planned behavior (Ajzen, 1991) with the implicit theory of intelligence (Dweck, 2006) to examine the relationship between teacher-related factors and intention to provide evidence-based reading instruction. The theories selected for this study complemented each other. The theory of planned behavior provided a model for examining teachers' beliefs regarding internal and external factors related to the reading instruction they provide, whereas the implicit theory of intelligence offered a framework for examining the influence of teachers' beliefs specific to students' capacity to benefit from the reading instruction they provide. Although there was some overlap in the scope of these two theories, each offered a unique perspective that, when taken together, allowed for a more comprehensive examination of teacher-related variables. Connor et al. (2014) suggested that the use of a conceptual framework that combines multiple theories is more likely to lead to the accurate identification of key factors at the student or classroom level than a single theoretical framework.

Ajzen's (1991) theory of planned behavior provided a well-established model for explaining how people's thoughts influence their behavior. This theory suggests that behavior is a result of behavioral intentions that are a function of the interaction between three kinds of beliefs about the individual: behavioral, normative, and control (Ajzen, 2002). Behavioral beliefs are concerned with the consequences the individual will likely

experience as a result of performing or failing to perform a given behavior. Normative beliefs include personal opinions about significant others' expectations for behavior and assumptions about how these significant others would act in a similar situation. Control beliefs represent individuals' thoughts about the level of autonomy they have in selecting and executing a particular behavior. Personal, social, and informational background factors are believed to influence each of these categories of beliefs in different ways and to varying degrees. The theory of planned behavior was relevant to the research question because this theory provided a framework for examining factors believed to predict intention to perform a behavior, in this case providing evidence-based reading instruction. When examining predictors of teachers' intention to use specific instructional strategies, it was important to consider teachers' beliefs about their students in addition to their self-beliefs.

Researchers have suggested that teachers' instructional practices are influenced by their implicit theory of intelligence, that is, their fundamental beliefs about students' innate ability to learn (García-Cepero & McCoach, 2009; Gutshall, 2014). Dweck's (2006) work on the implicit theory of intelligence indicated two distinct yet correlated constructs: entity theory of intelligence and incremental theory of intelligence. Those who adopt an entity theory tend to view intelligence as a stable trait and believe an individual can do little to change his or her intelligence level. In contrast, those with an incremental theory consider intelligence malleable and potentially under volitional control (Jones, Bryant, Snyder, & Malone, 2012). Preliminary empirical evidence indicated teachers' implicit theory of intelligence impacted the level and type of

instructional support they provide during reading instruction (Barbarin & Aikens, 2015; Gutshall, 2013). Teachers' implicit theory of intelligence was relevant to the examination of the predictive relationship between teacher-related factors and intention to provide evidence-based reading instruction.

The use of a conceptual framework that integrated the theory of planned behavior with the implicit theory of intelligence was consistent with the research design and methodology of this study. Adding the implicit theory of intelligence to the theory of planned behavior as a fourth category of beliefs allowed for consideration of a broad range of teacher-related variables in predicting intention to provide evidence-based reading instruction. Teachers' beliefs and intentions cannot be observed directly, so I used a survey to collect data on these variables. In the present study, Dweck's (2000) mind-set survey questions were added to a theory of planned behavior survey developed in accordance with Fishbein and Ajzen's (2010) guidelines. Multiple regression is often used to analyze data collected using a theory of planned behavior survey and lent itself to the inclusion of additional variables, namely mind-set beliefs, in the analysis. Examining the relationship between teachers' thoughts and behavioral intention through the lenses of the theory of planned behavior and implicit theory of intelligence had the potential to provide a more accurate and complete picture of how the variables of interest predicted intention to provide evidence-based reading instruction.

Nature of the Study

Primary teachers play an integral role in reading instruction, and research-based recommendations for effective reading instruction and intervention are readily available

to assist them in their efforts. However, evidence indicated that many teachers do not regularly employ evidence-based instructional strategies when teaching students how to read (Kuzborska, 2011; Seidenberg, 2013). Many factors influence teachers' instructional decision-making; however, researchers had not examined the predictive relationship between combinations of teacher-related factors and intention to provide evidence-based reading instruction. In the present study, I selected a quantitative approach to examine a set of teacher-related factors as independent variables using a conceptual framework that integrated the implicit theory of intelligence and the theory of planned behavior. I used an online survey to collect data on these variables from a convenience sample of primary teachers in the United States. Independent variables included teacher knowledge about basic language concepts and reading disabilities and teacher beliefs in four categories. The dependent variable was teachers' intention to provide evidence-based reading instruction. Multiple regression analysis was used to examine the predictive relationships among variables.

Definitions

The following terms were defined as follows for the purposes of this study:

Basic language concepts: Word-level concepts related to the structure of the English language that must be mastered to achieve basic reading proficiency (Washburn, Binks-Cantrell, et al., 2016; Washburn, Joshi, & Cantrell, 2011), including phonological awareness, phonemic awareness, decoding, alphabetic principle, and morphological awareness.

Education: The highest degree obtained by the teacher.

Evidence-based reading instruction: Instructional strategies identified through research as having a substantial likelihood of producing successful reading acquisition outcomes when used with beginning or struggling readers (Sciuchetti et al., 2016; Stichter, Stormont, & Lewis, 2009).

Experience: The number of years a teacher had taught in Grades K-3 (Washburn, Joshi, & Binks-Cantrell, 2011), the school setting, and the type of school in which the teacher had taught.

Teacher beliefs: "Implicit or explicit conceptions about school and learning-related matters that influence their perceptions of the environment and their behaviors" (Kunter et al., 2013, p. 807).

Teacher knowledge: Two broad categories of professional content knowledge shown to be critical to the ability to provide effective reading instruction: basic language concepts (Podhajski et al., 2009) and reading disabilities (Wadlington & Wadlington, 2005; Washburn, Joshi, & Binks-Cantrell, 2011).

Assumptions

Assumptions are made because it is impossible to demonstrate that all claims in the study have been confirmed to be true. I made several assumptions when designing this study. When using an online survey to collect data, I assumed that participants were who they portrayed themselves to be. The anonymous online survey did not permit verification of participants' identities, qualifications, or teaching responsibilities. Also, I did not have the ability to supervise the completion of the survey, so I assumed that

participants were literate and answered questions honestly and truthfully and without help from other people or resources, as indicated in the survey directions.

Other assumptions were related to the dependent variable, intention to provide evidence-based reading instruction. First, I assumed that the teaching strategies included in the Reading Teacher Beliefs and Instructional Intentions survey led to successful reading proficiency outcomes when applied with fidelity. To address this assumption, I consulted a variety of sources to determine the list of instructional strategies included on the Reading Teacher Beliefs and Instructional Intentions survey. Second, in choosing to measure behavioral intention instead of behavior, I assumed behavioral intention to be a direct antecedent of behavior, as proposed by Ajzen (2002).

Scope and Delimitations

Reading failure is a complicated issue with many contributing factors. Duke and Block (2012) identified three primary obstacles to improving reading proficiency outcomes in the United States: a short-term orientation to reading reform, low teacher effectiveness, and limited instructional time. The scope of the present study was limited to the second of these obstacles. I examined teacher-related factors that influence intention to use instructional strategies identified as effective for beginning and struggling readers.

The set of variables selected for the study included those that represented the constructs from the theories integrated in the conceptual framework. The effectiveness of a teacher is influenced by the selection and implementation of instructional strategies as well as classroom management strategies (Reddy et al., 2013). The present study focused

on intention to use specific instructional strategies as an indicator of teacher effectiveness, not teachers' expertise in classroom management.

Other boundaries of the study included those related to population and theoretical frameworks. Participants in this study were limited to primary teachers working in general education classrooms in the United States. Primary teachers were included because they are responsible for providing reading instruction. This responsibility creates the need for a unique knowledge base. Preschool teachers and those teaching in fourth grade and above do not have the same requirements for knowledge and expertise and were excluded from participation. Similarly, special education teachers have different training and teaching experience than general education teachers and were excluded from the study. Most students with dyslexia, the most common reading disability, remain in general education settings under the guidance of general education teachers (Davidson, 2013). Therefore, it was important to examine intention to provide evidence-based reading instruction in general education settings. Lastly, the education system and reading instruction in the United States are different from those in other countries; only teachers from the United States were included in the study.

Two theories were integrated to provide a conceptual framework for the study: the theory of planned behavior and the implicit theory of intelligence. Another theory commonly used in education research on teacher-related factors is Weiner's attribution theory. Attribution theory is concerned with controllability and suggests effort is an internal and controllable factor whereas ability is an uncontrollable factor (Woodcock & Vialle, 2011). Because this idea was in direct conflict with the implicit theory of

intelligence, attribution theory was not an acceptable framework for the study. Also, attribution theory was not appropriate because this study was concerned with teachers' intention to provide evidence-based reading instruction and attribution theory is concerned with the ultimate outcome (Woodcock & Vialle, 2011), which would be students' reading proficiency outcomes. This study was limited to the examination of the teacher-related factors that influence student outcomes and did not address student outcomes.

Generalizability of the present study was limited because an experimental design was not used. Focusing on the role the teacher plays in the reading acquisition process and restricting the variables to a subset of teacher-related factors further limited the population to which the findings of this study could be generalized. Teachers from across the United States were included in an effort to increase the generalizability of the findings to primary teachers from a wide geographical area.

Limitations

In the present study, limitations were noted in relation to design and methodology, particularly in the areas of sample selection, variables, data collection method, and data analysis. Also, potential sources of bias that could have influenced study outcomes were identified, and attempts to address them are described in this section. First, the sample did not represent a random selection of participants; therefore, the study was not a true experiment, and the generalizability of the findings was limited. Also, the use of an online survey to collect data ensured only those with access to the technology had an opportunity to participate. The population of interest, primary teachers in the United

States, was expected to have access to and the ability to use the Internet to complete a survey.

Other limitations arose from the selection of variables. First, available resources limited the focus of this study to a subset of teacher-related variables, a decision that failed to capture the complexity of the reading acquisition process. Variables other than teacher-related factors, such as student motivation, influence students' reading proficiency outcomes (Spear-Swerling et al., 2016); however, these variables were not included in the study. Second, the decision to measure teachers' intention to provide evidence-based reading instruction instead of measuring teachers' instruction further separated the measured variable from the fundamental social problem of interest: student's reading proficiency outcomes. Khonamri and Salimi (2010) found that teachers did not always act in accordance with their beliefs in the context of a highly complex learning environment with multiple influencing factors. However, understanding the influence of a limited set of variables on students' reading proficiency outcomes may provide a foundation for investigation.

Methodological limitations resulted from the decision to rely on an anonymous online survey as the sole source of data (see Sharp, Brandt, Tuft, & Jay, 2016). The anonymous online survey method did not allow for determination of the response rate. Therefore, it was impossible to determine whether the participants who responded to the survey differed significantly in any way from those who did not. Other weaknesses related to the use of an online survey included a lack of opportunity for participants to ask clarifying questions of the researcher, a lack of control over who completed the survey,

and exclusion of potential participants who did not have access to a computer or the Internet. In addition, self-reported data are subject to multiple threats including memory loss, lack of comprehension, and social desirability bias, which is the tendency to answer questions in ways that are perceived to be socially acceptable but may not reflect the participant's true feelings (Douglas, 2009; Klehm, 2013; Washburn, Joshi, & Binks-Cantrell, 2011; Washburn, Joshi, & Cantrell, 2011).

Lastly, the data analysis strategy used in this study may be considered a limitation. Although the use of multiple regression analysis allowed me to ascertain a relationship between variables, it did not permit the identification of the underlying causal mechanisms. Therefore, conclusions drawn from this study were limited in scope and complexity.

In any study, potential researcher bias must be identified and measures must be taken to limit the impact. I am a former primary teacher who worked with beginning and struggling readers and who did not have the content knowledge necessary to provide evidence-based reading instruction. My classroom experiences and later professional development may have influenced my perceptions and opinions about reading instruction and the teachers responsible for providing reading instruction. Throughout the design and implementation of this study, I took care to reflect on the influence of this perspective on decision-making and to minimize the impact of this potential bias. For instance, I followed the guidelines provided by Ajzen (2006) to clearly define the population of interest when developing the theory of planned behavior questionnaire and to include participants from that population.

Significance

This study was designed to contribute to improved educational experiences and outcomes for students who struggle with reading acquisition. The study addressed this positive social change opportunity indirectly by focusing on teachers instead of students. Primary teachers' most critical academic responsibility is to teach students how to read (Joshi, 2003), and when students do not achieve reading proficiency, this failure can be attributed to the teacher as much as to the student. Investigation of teacher-related factors was needed to improve outcomes for all students (Fuchs, Kahn-Horwitz, & Katzir, 2019).

The present study had the potential to advance knowledge related to the relationships among teacher knowledge, teacher beliefs, and behavioral intentions during reading instruction including the use of evidence-based practices. A better understanding of the factors that influence teachers' intentions to use instructional strategies may contribute to new policies and practices related to teacher selection processes, preparation programs, and professional development offerings. Improving teacher selection and preparation may result in teachers who are better equipped to provide initial reading instruction and respond to students who are struggling with reading. Potential positive social change from this study included providing knowledge useful to educators, researchers, and policymakers committed to improving reading proficiency outcomes for all students.

Summary

Reading failure is rampant in the United States and has been for many years (Seidenberg, 2013). A contributing factor is the nature and quality of the reading

instruction teachers provide; researchers have shown that teacher-related factors including knowledge, beliefs, and instructional behaviors have a profound impact on students' academic outcomes including reading proficiency rates (Shim, Cho, & Cassady, 2013). However, researchers had not examined the relationship between combinations of teacher-related factors and instructional decisions related to the use of evidence-based reading instruction. In the present study, I integrated two established theories into an innovative conceptual framework to conduct a systematic examination of multiple predictors of intention to provide evidence-based reading instruction and to identify factors that may be susceptible to intervention (see Richardson, Rosenthal, & Burak, 2012). By examining teacher-related factors that influence students' reading proficiency outcomes, I intended to provide administrators and teacher educators with an opportunity to use this information to improve professional development and teacher preparation programs to better support and prepare teachers to ensure successful reading acquisition outcomes for all children.

In Chapter 2, I provide an in-depth explanation of the benefits of using the theory of planned behavior and implicit theory of intelligence to examine the predictive relationship between teacher-related factors and intention to provide evidence-based reading instruction. I also examine current understanding of each of the key variables included in this study.

Chapter 2: Literature Review

Introduction

The most fundamental and critical academic obligation of schools and teachers is to ensure successful reading acquisition (Joshi, 2003; Moats, 2009b). However, evidence indicated that more than two thirds of students in the United States fail to achieve reading proficiency by the end of third grade (Annie E. Casey Foundation, 2010), and that reading proficiency outcomes of fourth-grade students have remained virtually stagnant since 1996 (Podhajski et al., 2009). Local, state, and federal efforts to improve reading proficiency outcomes have produced a body of evidence including protocols for effective instruction. Al Otaiba, Lake, Scarborough, Allor, and Carreker (2016) found that evidence-based instructional protocols, if applied, would result in successful reading acquisition outcomes for the vast majority of students. However, findings also suggested a failure to implement evidence-based instruction in primary classrooms across the United States (Kuzborska, 2011; Piasta et al., 2009; Seidenberg, 2013). Understanding the factors that influence teachers' use of evidence-based instructional strategies for reading is essential to increase the frequency and fidelity of their use and to improve students' reading proficiency outcomes.

Researchers have documented some teacher-related factors that correlate with teachers' use of evidence-based reading instruction. A considerable and growing body of evidence has supported the influence of factors, including teacher knowledge and beliefs, on students' academic outcomes (Cunningham et al., 2009; Hagan-Burke et al., 2013; Muijs & Reynolds, 2002). However, researchers have not used the conceptual framework

chosen in the current study to examine the particular set of teacher-related factors included in the study. The purpose of this study was to examine the degree of predictive relationship between teacher-related factors and intention to provide evidence-based reading instruction using a conceptual framework that integrates the theory of planned behavior and implicit theory of intelligence.

In this chapter, I describe the approach I used to conduct a search of the extant literature related to key variables and to synthesize what I learned from reading the literature. First, I outline my approach to the literature search, including the databases and search terms I used to find relevant articles. Then, I describe two relevant theories and provide a rationale for combining them into a single conceptual framework to better understand the relationship between teachers' thinking and behaviors. Next, I synthesize the literature addressing teacher-related factors, including knowledge, beliefs, background, and instructional strategies to provide a context for this study.

Literature Search Strategy

A review of 68 articles on related topics provided an initial list of major sources relevant to the study. Topics included the theory of planned behavior, implicit theory of intelligence, reading acquisition, reading instruction, reading failure, and instructional beliefs, attitudes, perceptions, and behaviors. I conducted a systematic search to identify current, scholarly, and relevant articles. The steps of this search are described below.

First, I listed key search terms for each topic and identified relevant databases. Primary search terms included the *theory of planned behavior*, *Ajzen*, *implicit theory of intelligence*, *Dweck*, *mind-set*, *reading disabilities*, *reading difficulties*, *dyslexia*, *litera**,

*teach**, *read**, and *educat**. Thoreau, a multidatabase search engine, was used for the initial search of these terms. For subsequent searches, I used discipline-specific databases in education (Academic Search Complete, Research Starters in Education, Teacher Reference Center, ERIC, and Education Research Complete) and psychology (ProQuest Central, PsycARTICLES, PsycINFO, and SAGE Premier).

Next, I established preliminary selection criteria to identify relevant research articles. Adopting specific criteria can increase the transparency and replicability of the search and minimize bias in the selection of relevant articles (Smallbone & Quinton, 2011). To be considered for this review, an article had to have been peer-reviewed, published after 2010, written in English, focused on some aspect or area of education, and not duplicate another identified article. Also, the article had to focus on at least one of the following: teachers, teacher beliefs, teacher attitudes, teacher perceptions, teacher behaviors, reading, reading difficulties, reading disabilities, dyslexia, the theory of planned behavior, or implicit theory of intelligence. A small number of articles considered seminal to a particular topic or in their respective fields and a larger number of articles published in 2009 and 2010 in response to the National Reading Panel report were also identified and included.

I created a literature search matrix to guide and document the initial search (Smallbone & Quinton, 2011). The key terms and combinations of key terms were listed in the first column, and the databases were listed across the top row. A total of 116 additional articles were identified through this preliminary search. Each of these articles was assigned a number and downloaded and saved in an electronic folder using the

following naming convention: assigned number, the first author's last name, and the article title.

Inclusion criteria were refined to select articles that would best address the research question under investigation. To be retained, articles had to focus on K to 12 education, adopt the perspective of the teacher, and focus on at least one of the following: theory of planned behavior or implicit theory of intelligence, reading acquisition, instruction, failure, or teacher characteristics. In accordance with the suggestions of Webster and Watson (2002), these criteria were used to develop a concept matrix. Each of the original articles and the additional articles found in the preliminary search was reviewed and evaluated using the concept matrix. The most common reasons for exclusion included a focus on postsecondary education or application of theory from a student perspective.

The completion of the initial concept matrix resulted in the exclusion of 41 articles. During the course of the study, additional searches were conducted to check for newly published articles using the search terms and criteria described above. Over 100 articles were selected for inclusion in the literature review.

Conceptual Framework

Although scientists understand how humans acquire the ability to read, the process of teaching children how to read is complicated by several factors. The present study focused on teacher-related factors that influence reading instruction using a conceptual framework that integrated the theory of planned behavior and implicit theory

of intelligence. This approach allowed for examination of diverse factors by taking advantage of the strengths of each theory while addressing inherent limitations.

The theory of planned behavior, intended for use in predicting and understanding human behavior (Ajzen, 1991), provided a useful framework for examining the relationship between teachers' thoughts and behaviors in a classroom setting. In this theory, an individual's attitude toward a specific behavior, beliefs about subjective norms related to the behavior, and perceived control over the performance of the behavior influence his or her intention to perform the behavior, which is assumed to be the immediate antecedent of the behavior (Ajzen, 2002).

When considering factors that predict intention to provide evidence-based reading instruction, however, I determined that the egocentric nature of the theory of planned behavior may prove limiting. In this theory, the individual serves as the only point of reference for identifying, examining, and evaluating beliefs. Missing from a framework based on the theory of planned behavior was the consideration of teachers' beliefs about students' inherent capacity to benefit from the instruction they provide.

Teachers adopt a mind-set based on the beliefs and assumptions they hold about themselves and others. According to the implicit theory of intelligence, mind-set beliefs are based on assumptions about the stability of intelligence (Dweck, 2006). Individuals with an entity theory, or fixed mind-set, see intelligence as a stable trait that a person can do little to change, whereas those with an incremental theory, or growth mind-set, believe a person's level of intelligence is malleable and can increase with effort (Dweck, 2000). These mind-set beliefs guide attitudes and behaviors (García-Cepero & McCoach, 2009),

and it is through this psychological lens that teachers make sense of their experiences in the classroom (Yeager & Dweck, 2012). An examination of the factors that may predict intention to use specific instructional strategies would have been inadequate if it had failed to consider the impact a teacher's implicit theory of intelligence has on instruction.

I integrated the implicit theory of intelligence into the theory of planned behavior as a fourth category of beliefs: mind-set beliefs. Combining the theories allowed for a more comprehensive examination of the complex process of teaching reading. The theory of planned behavior and implicit theory of intelligence are addressed in the sections that follow.

Theory of Planned Behavior

The theory of planned behavior (Ajzen, 1985, 1991) attempts to explain the link between the beliefs people have and their behavior (Ajzen, Joyce, Sheikh, & Cote, 2011). The theory of planned behavior provides an explanatory model for examining both direct and indirect determinants of behavior (Lee, Cerreto, & Lee, 2010). Ajzen's (1991) theory includes four primary constructs: behavioral intention and three "conceptually independent determinants of intentions" (p. 188). Behavioral intention represents the willingness to carry out a behavior (MacFarlane & Woolfson, 2013) and is considered the immediate antecedent of the behavior (Ajzen, 2002). The three direct determinants or predictors of behavioral intention in the theory of planned behavior are attitude toward the behavior, subjective norm, and perceived behavioral control (Ajzen, 1985). The relative importance of each determinant varies depending on the particular behavior as well as the context (Ajzen et al., 2011).

Behavior. Ajzen (1985) described an intended *behavior* as a goal whose attainment depends on numerous internal and external factors. For example, primary teachers across the United States accept responsibility for teaching students how to read. A variety of internal factors of the teacher, including knowledge, skill, abilities, willpower, emotions, level of commitment, and compulsions, can influence success in producing proficient readers. External factors can also interfere with or promote the successful performance of any behavior. Time and available resources are two such factors. Teachers are limited in the number of instructional minutes they have each year and, by extension, the amount of time they have to teach students how to read. Teachers are also influenced by the quality of the adopted curriculum and availability of supplemental materials that support the curriculum (Ruppar et al., 2015). Also, there is a lack of control over a particular behavior when the successful performance of the behavior depends on the actions of another person (Ajzen, 1985), as is the case with reading instruction.

Behavioral intention. Behavioral intention plays a central role in the theory of planned behavior. Ajzen (1985) defined *behavioral intention* as a plan of action in pursuit of a behavioral goal. According to a more recent definition, behavioral intention was understood to indicate the amount of effort an individual is willing to expend to perform a given behavior (Ajzen, 1991). Behavioral intention has also been defined as an expected outcome based on planned actions or behavior (Sadaf, Newby, & Ertmer, 2012), and the motivational factors that influence the performance of behavior are accounted for within the construct of behavioral intention. There is theoretical and empirical support for

the value of measuring behavioral intention as a proximal indicator of a specific behavior (Francis et al., 2004) in answering certain research questions (Lee et al., 2010).

Availability of resources for the present study did not allow for observation of teachers' instructional behaviors in a classroom setting. The online survey instrument used to collect data on teacher knowledge, beliefs, and background was also used to collect data on intention to provide evidence-based reading instruction.

Beliefs. Ajzen (1991) defined *beliefs* as "salient information relevant to a behavior" (p. 189). Beliefs provide a foundation upon which behaviors are based (Heath & Gifford, 2002). Differences in beliefs corresponded to behavioral differences and provided valuable information about the factors that influenced behavioral intention (Ajzen, 1991). Whether or not a teacher believes students can increase their intelligence and, as an extension, their reading ability is relevant to how the teacher chooses to address the needs of a beginning or struggling reader. External factors such as the school culture and the collective norms of educators in a school also influence the degree of alignment between teachers' behaviors and their beliefs (Shim et al., 2013).

In the theory of planned behavior, there are three types of beliefs: attitude toward the behavior, subjective norm, and perceived behavioral control (Ajzen, 2011). For each of these direct determinants of behavioral intention, there is an indirect determinant: behavioral beliefs, normative beliefs, and control beliefs, respectively.

Attitude toward the behavior. Attitude toward the behavior encompasses one's feelings about performing a behavior (Ajzen, 2011). Behavioral beliefs are related to individual perceptions and interpretations of the consequences of performing the behavior

in question (Ajzen, 1991), and these beliefs contribute to an individual's attitude toward the behavior. The strength of behavioral beliefs influences attitude toward the behavior (Ajzen, 1985).

Subjective norm. The perception of how significant others would respond to the performance of the behavior is represented by subjective norm. Normative beliefs are the indirect determinants of subjective norm and are concerned with the expectations and practice of significant others. Whether or not an individual believes important others participate in the behavior or approve of the behavior (Ajzen, 1985) is related to his or her normative beliefs. Fulmer and Turner (2014) reported that teachers perceived pressure from above (principals, education policy and practice, including state mandated tests), within (self-efficacy, intrinsic motivation, and theories about teaching and learning), and below (perceptions about students' intellectual ability, engagement, and motivation). Each source of pressure had the potential to influence teachers' normative beliefs.

Perceived behavioral control. The most often misunderstood of the three direct determinants of behavioral intention, *perceived behavioral control*, takes into account an individual's evaluation of the likelihood of successful completion of the behavior (Ajzen, 1991). This determinant of behavioral intention encompasses two distinct components: self-efficacy and controllability (Ajzen, 2002). *Self-efficacy* is a measure of confidence in one's ability to successfully perform a behavior (Ajzen, 1991). *Controllability* is related to the autonomy an individual believes he or she has in choosing whether or not to perform the behavior (Ajzen, 2002). *Control beliefs*, or beliefs about the presence or

absence of factors that facilitate or impede the performance of the behavior, are indirect determinants of perceived behavioral control.

Background factors. Three categories of background factors are included in the theory of planned behavior: personal, social, and information (Ajzen, 2011). *Personal* factors include general attitude, personality traits, values, emotions, and intelligence. Characteristics that describe the individual such as age, gender, race, ethnicity, education level, income, or religion are considered *social* factors. Experience, knowledge, and media exposure influence beliefs and are categorized as *information* factors in the theory of planned behavior. In the current study, I examined four relevant background factors: age, gender, education level, and experience.

Theory of Planned Behavior and Similar Research

As the instructional leader in the classroom, the teacher sets the stage for the outcomes that follow. Shim et al. (2013) found that characteristics and behaviors of the teacher contributed to the effectiveness of multiple aspects of classroom practices and policies, including the learning environment, initial instruction, assessment and progress monitoring, intervention for struggling students, and students' academic outcomes. In classrooms across the United States, teachers' beliefs about teaching and learning influenced their instructional decision-making (Kuzborska, 2011). The theory of planned behavior offered a clear and concise framework for understanding teachers' instructional practices in light of various influences (Lee et al., 2010). This theory was useful because it considered aspects of the relationship between teacher and student from the perspective of the teacher. The theory of planned behavior has been used to examine teachers' use of

technology (Demir, 2010; Sadaf et al., 2012; Teo & Lee, 2010), physical education teachers' responses to students with disabilities (Casebolt & Hodge, 2010; Hodge et al., 2009; Jeong & Block, 2011), and general education teachers' attitudes and behaviors toward students with disabilities (Elik, Wiener, & Corkum, 2010; MacFarlane & Woolfson, 2013).

The findings of theory of planned behavior studies conducted in the United States and Singapore that examined teachers' intentions to use technology were inconsistent. Demir (2010) found attitude toward the behavior and perceived behavioral control were significant predictors of intention to use the internet for professional development. Examining intention to use Web 2.0 technologies (wikis, blogs, social networking, etc.), Sadaf et al. (2012) also found that attitude toward the behavior and perceived behavioral control achieved significance as predictors of intention. In contrast, Teo and Lee (2010) found that attitude toward the behavior and subjective norm were significant predictors of intention to use technology. Lee et al. (2010) adopted a narrow definition of the target behavior: teachers' use of computers to create and prepare lessons; and their results indicated all three constructs (attitude toward the behavior, subjective norm, perceived behavioral control) were significant predictors of intention, providing support for the overall model and the use of a narrowly defined target behavior.

The findings of studies that used the theory of planned behavior to examine physical education teachers' attitudes, beliefs, and behaviors in regard to students with disabilities were also inconsistent. Casebolt and Hodge (2010) and Hodge et al. (2009) reported mixed results in their qualitative studies. Using a quantitative approach, Jeong

and Block (2011) found all three categories of direct determinants and their corresponding indirect determinants predicted behavioral intention, providing support for the overall model. In another study, Richardson et al. (2012) examined physical education teachers' and coaches' use of exercise as punishment and found attitude toward the behavior and subjective norm were significant predictors of behavioral intention. Richardson et al. also found age to be significant where others did not.

Elik et al. (2010) used aspects of the theory of planned behavior model to examine preservice teachers' attitudes toward students with behavioral and learning difficulties. MacFarlane and Woolfson (2013) employed the complete model to examine relationships between teacher attitudes and behavior toward students with social, emotional, and behavioral difficulties and found subjective norm to be the only significant predictor of behavioral intention. The persistence of inconsistent results in their study and others led MacFarlane and Woolfson to question the direct transfer of the theory of planned behavior from health to education settings.

Inconsistent application of the theory of planned behavior may have contributed to inconsistent results. Although Giorgi, Roberts, Estepp, Conner, and Stripling (2013) found general support for the theory of planned behavior model, the researchers used an alternative definition of beliefs in their investigation. Likewise, Elik et al. (2010) found value in using the model but measured teachers' attitudes toward students instead of attitude toward a behavior, as it is defined in Ajzen's (1991) model.

Theory of Planned Behavior and the Current Study

The theory of planned behavior was a logical choice for the current study for conceptual and practical reasons. Strengths of this model included its concise explanation, integration of key constructs, and clear operational definitions for each construct (see Heath & Gifford, 2002). Ajzen (2011) intended that the theory of planned behavior be used to understand complex human behavior in a particular context. Teaching others how to read is complicated, and the current study was designed to examine the relationships between multiple teacher-related factors and intention to provide evidence-based reading instruction in the context of the model. Researchers have found the theory of planned behavior model useful when the individual does not have complete control over the outcome of the behavior or the possibility of failure is high (Ajzen, 1985), as is the case with reading instruction. By employing the theory of planned behavior to examine predictors of intention to provide evidence-based reading instruction, I contributed to alleviating the paucity of studies examining the impact of teacher knowledge and beliefs on instructional behaviors described by Washburn et al. (2014)

The link between intentions and behavior in the theory of planned behavior has been supported by empirical evidence (Ajzen et al., 2011). Furthermore, Ajzen (1991) suggested that even though the behavior of individuals in any given group may not correspond to their intention when aggregated, behavioral intention was a highly accurate predictor of behavior for the whole group. For this study, I measured intention to perform particular instructional behaviors instead of measuring performance of the behavior.

The theory of planned behavior was appropriate for the current study for practical reasons as well. To apply the complete model, all variables in the theory of planned behavior must be measured; however, Ajzen (1985) contended that investigating a limited set of variables or relationships could be appropriate for some research questions. Of particular relevance to the current study, is Ajzen's (1991) contention that:

> The theory of planned behavior is open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intentions of behavior after the theory's current variables have been taken into account. (p. 199)

Ajzen went on to invite expansion of the theory of planned behavior. More recently, other researchers including Salleh and Laxman (2015) have cited the inadequacy of the three categories of beliefs in their call for refinement of the theory of planned behavior. In the present study, adding the implicit theory of intelligence to the theory of planned behavior as a fourth category of beliefs allowed for consideration of a broad range of teacher-related variables in predicting intention to provide evidence-based reading instruction.

Implicit Theory of Intelligence

Implicit theories represent an individual's core assumptions about the malleability of human characteristics, such as intelligence or ability (Gutshall, 2013; Jonsson, Beach, Korp, & Erlandson, 2012; Rattan, Good, & Dweck, 2012; Torgeson, 2000). These assumptions fall on a continuum that ranges from completely malleable to completely static. Implicit theories about a particular characteristic are related to beliefs and

behaviors in other areas, and Dweck (2006) suggested that one's implicit theories permeate all aspects of daily living. Applying these assumptions creates a cognitive framework that allows the individual to make predictions about, organize, and filter the meaning of everyday events (Moore, Hlava, Garcia, & Brem, 2013; Yeager & Dweck, 2012). For example, Hornstra et al. (2010) found teachers' expectations for students' academic performance were influenced by their implicit beliefs about the academic potential of their students. Likewise, Blackwell, Trzesniewski, and Dweck (2007) reported students' implicit theory of intelligence influenced responses to academic challenges. Examining the implicit theory of intelligence is important because these beliefs are thought to impact both attitudes and behavior (García-Cepero & McCoach, 2009).

Entity theory. According to the implicit theory of intelligence framework, those who believe intelligence is a stable, inherent trait hold an *entity theory* or *fixed mind-set*. These individuals focus on proving their worthiness, skills, and knowledge (Moore et al., 2013) and on gaining the approval of others. Individuals with an entity theory tend to adopt performance goals (Bodill & Roberts, 2013) and avoid challenges (Yeager & Dweck, 2012), often giving up quickly when faced with obstacles. Within this belief system, effort is assumed to have little to no effect on achievement, and increased effort indicates a lack of intelligence. Those with a stronger entity theory tended to ignore constructive feedback and often feel threatened by the success of others (Dweck, 2006).

Rattan et al. (2012) found that teachers who had a stronger entity theory doubted their efforts would make a measurable impact on students' academic outcomes and these

teachers allocated more attention and resources to students they perceived as having a higher potential for success. Researchers also found individuals were inclined to hold the same theory for others as they did for themselves (Moore et al., 2013). For instance, teachers with a stronger entity theory failed to see the value of their efforts, did not recognize the value of effort for students (Jones, Miron, & Kelaher-Young, 2012) and rarely provided students with challenging tasks (Espinoza, da Luz Fontes, & Arms-Chavez, 2014). Holding a strong entity theory of intelligence also led to expressions of support and encouragement that were detrimental to students' success (Dweck, 2006), such as praising students for their perceived intelligence (i.e., you are so smart) instead of praising effort and persistence (i.e., you worked so hard).

Incremental theory. Individuals with an *incremental theory* of intelligence or *growth mind-set* believe one's level of intelligence can change with effort and dedication. Those who have a stronger incremental theory value learning opportunities (Bodill & Roberts, 2013) and demonstrate a willingness to embrace challenges and persist when faced with adversity (Yeager & Dweck, 2012). Individuals with a strong incremental theory adopted mastery goals that focused on improving skills and knowledge (Moore et al., 2013). In addition to influencing the type of goals individuals set, adopting a strong incremental theory impacted beliefs about effort, attributions for setbacks, and approaches used to confront obstacles (Yeager & Dweck, 2012) and was associated with increased academic achievement (Blackwell et al., 2007; Jones, Bryant, et al., 2012). Dweck (2007b) found that students who believed they could change their abilities and

intelligence through effort were more highly motivated to succeed than students who did not think a change was possible.

In a seminal study, Blackwell et al. (2007) found that one's implicit theory of intelligence was more relevant in times of difficulty than in times of ease. Their results indicated that when tasks were easy, and the individual did not feel threatened, holding a stronger entity theory did not appear to have an overly negative influence, and performance was fairly equivalent. When tasks were difficult, having an incremental theory acted as a buffer that allowed the individual to persevere (Blackwell et al., 2007). Many teachers may consider reading instruction difficult; however, to my knowledge, no extant literature examined differences in reading instruction between teachers with stronger incremental theories and those with stronger entity theories or compared the instructional practices used with beginning readers to the practices used with struggling readers as a function of the teacher's implicit theory of intelligence.

Implicit Theory of Intelligence and Similar Research

For many years, Dweck (2007a) focused on examining factors that influenced student motivation. She conducted research to understanding the nature of students' mind-sets and the implications for achievement and motivation. Her findings indicated students' implicit beliefs about the stability of their ability, or their mind-set was a key factor in student motivation. Other researchers found that students' implicit theories of intelligence affected academic performance over time (Blackwell et al., 2007; Gwernan-Jones & Burden, 2009; Park & Kim, 2015). Although much of the initial research on implicit theories focused on students, more recently, scientists have begun to apply the

theoretical framework to teachers' beliefs about themselves and their students (see Shim et al., 2013).

Extant literature provided support for the influential nature of teachers' implicit theory of intelligence. For instance, Dweck (2006) suggested that teachers who held a stronger entity theory tended to focus on whether or not they could teach and students could learn whereas teachers who displayed a stronger incremental theory were more likely to concentrate efforts on figuring out how they could teach students or how particular students would learn best. Jones, Miron, and Kelaher-Young (2012) found that teachers' implicit theories of intelligence affected students' implicit theories which impacted students' motivation and achievement. Likewise, Jonsson et al. (2012) found that students adopted their teacher's implicit theory of intelligence, illustrating the long-term impact teachers have on their students. Additional researchers suggested teachers' implicit theory of intelligence influenced instructional practices including initial diagnosis of ability (Rattan et al., 2012), the establishment of classroom goals and environment (Shim et al., 2013), and responses to students' perceived ability (Rattan et al., 2012).

Rattan et al. (2012) found teachers' mind-set beliefs influenced initial assumptions about students' overall math abilities and the instructional approaches the teachers used based on these assumptions. In comparison to teachers with a stronger incremental theory of intelligence, teachers who demonstrated a stronger entity theory more readily made judgments based on initial or limited information (Rattan et al., 2012), were more influenced by these early assumptions (Espinoza et al., 2014), and were less

likely to change their assumptions (Shim et al., 2013). Teachers with a strong entity theory also tended to assume limited ability based on a single performance (Rattan et al., 2012; Moore et al., 2013; Shim et al., 2013), pay more attention to information that was consistent with stereotypes (Espinoza et al., 2014), and make comparisons between students instead of considering individual students' academic growth over time.

Shim et al. (2013) found that teachers' implicit theory of intelligence influenced the types of goals (i.e., performance vs. mastery) they set in the classroom. Furthermore, teachers' who held an entity theory of intelligence were more likely to promote a competitive classroom environment than teachers who held an incremental theory (Jonsson et al., 2012).

Throughout any given lesson, teachers evaluate the effectiveness of the instruction and respond to students' needs. Klehm (2013) suggested that the implicit theory of intelligence may play an important role in teachers' responses during instruction due to the immediacy of many of the decisions they make. Shim et al. (2013) found that teachers who had a strong incremental theory tended to value and promote individual student gains and provided more equitable instructional support and encouragement than teachers with a weak incremental theory. Teachers with a strong incremental theory also recognized the importance of ongoing assessment and changed their assumptions about students' abilities based on new information (Rattan et al., 2012). Moore et al. (2013) found that teachers with a strong incremental theory offered process-related praise that encouraged students to persist and used a variety of strategies to help students learn.

Jones, Bryant, et al. (2012) called for additional research to examine how teachers' implicit theories influence their thoughts and instructional behaviors in the classroom, particularly in relation to students' academic outcomes. Shim et al. (2013) reported that relatively few studies used the implicit theory of intelligence as a framework for examining and understanding teachers' instructional behaviors, and even fewer focused on primary teachers. Thus, there was an identified gap in the literature regarding the influence of primary teachers' beliefs about students' intelligence on instruction (Gutshall, 2013; Jones, Bryant, et al., 2012; Shim et al., 2013).

Implicit Theory of Intelligence and the Current Study

Researchers provided evidence to support the idea that teachers' beliefs about intelligence influence the instruction they provide (Jonsson et al., 2012). However, factors beyond teachers' implicit theories of intelligence are thought to influence the relationship between teachers' thinking and their instructional practice (see Holzberger et al., 2013). For example, researchers have not adequately examined how a teacher's implicit theory of intelligence influences his or her instructional approach to students who struggle to acquire knowledge or skills (Gutshall, 2013). Studies that examine teachers' implicit theory of intelligence related to providing instruction to students with reading difficulties may prove valuable; although a more elaborate theoretical framework than that provided by the implicit theory of intelligence may be necessary, given the complexities inherent in teaching students how to read. Additional research is also needed to understand better the relationship between implicit theory of intelligence and

other types of beliefs thought to impact instructional practice (Gutshall, 2014), such as the three determinants of behavioral intention included in the theory of planned behavior.

Combining the Theory of Planned Behavior and Implicit Theory of Intelligence

The theory of planned behavior was a useful model for predicting behavior using behavioral intentions guided by multiple egocentric beliefs (see Ajzen, 2002). Using this model, I was able to account for the influence of teachers' beliefs about the likely outcomes of their behavior, the expectations of the principal and parents, and teachers' perceived level of control over the instructional strategies they use when teaching students how to read. However, Salleh and Laxman (2015) suggested the three determinants of behavior did not account for the complete range of factors that influenced behavior and, consequently, called for modification of the theory. MacFarlane and Woolfson (2013) suggested adding teacher, child, or environment-related variables to the theory of planned behavior model and called for additional research. One possibility for refining the theory of planned behavior was to include a category of beliefs related to perceptions about the intended target of the particular behavior, for example, teachers' implicit theory of intelligence or their *mind-set beliefs*. The current study included teachers' mind-set beliefs about their students' intelligence as a fourth predictor of behavioral intention in the theory of planned behavior model.

One could argue that teachers' mind-set beliefs were captured within perceived behavioral control beliefs or fell under the category of background factors in the theory of planned behavior framework. However, under closer examination, it became apparent that this was not the case. Perceived behavioral control includes two distinct, but

correlated components: self-efficacy and controllability (Ajzen, 2002). Self-efficacy is a measure of confidence in the ability to execute a particular behavior (Ajzen, 1991). For teachers responsible for providing reading instruction, self-efficacy is a personal judgment of one's ability to teach students how to read, not of the students' ability to learn to read. Controllability, in contrast, is a measure of the degree of choice an individual believes he or she has in performing or not performing the behavior in question (Ajzen, 2002). In the context of reading instruction, controllability is related to the selection and implementation of particular instructional strategies. Neither of these components focuses on beliefs about the student.

Background factors influence mind-set beliefs just as they influence behavioral, normative, and control beliefs. Two background factors relevant to the current study were experience and knowledge. Jonsson et al. (2012) found a relationship between teachers' mind-set beliefs and years of teaching experience: older, more experienced teachers and younger, less experienced teachers were most likely to hold entity theory of intelligence. Also, studies that included treatments designed to change participants' implicit theory of intelligence through education and training demonstrated that it is possible to change mind-set beliefs (Dweck, 2012). For these reasons, I choose to include mind-set beliefs as a fourth category of beliefs in the conceptual framework rather than a background factor.

Literature Review Related to Key Variables

The cognitive process of acquiring the ability to read remains consistent for all students (Seidenberg, 2013); however, Holzberger et al. (2013) found that students in the same classroom had different educational experiences and academic outcomes. Various

environmental, cognitive, and psychological factors have been shown to affect reading achievement (Aaron et al., 2008). Researchers found teacher quality, and by extension effective instruction, to be the key factor in student achievement in general (Lyon & Weiser, 2009; Seidenberg, 2013; Wadlington & Wadlington, 2005) and in reading specifically (Al Otaiba et al., 2016; Cunningham et al., 2009; Moreau, 2014). Callinan et al. (2013) argued that teachers were the most influential factor in students' academic outcomes, and Wadlington and Wadlington (2005) pointed to effective teaching as the primary factor that determined if adequate learning took place.

Effective teaching requires a combination of knowledge and skill (Kunter et al., 2013). Researchers found that teacher effectiveness was related to teachers' ability to understand content as well as pedagogy (McCutchen, Abbott, et al., 2002; Piasta et al., 2009), to identify and appropriately address each student's unique learning needs (Lyon & Weisner, 2009), and to collaborate with other professionals to promote student success (Joshi et al., 2009). Researchers and administrators agreed that teachers vary in their effectiveness (Conner et al., 2014) and additional research was needed to understand the nuances between teacher-related factors and effective instruction.

Consistently over time, teacher expectations have been shown to impact students' achievement. In 1968, Rosenthal and Jacobson demonstrated the impact of teachers' expectations on students' intellectual development in their classic Pygmalion in the classroom study. More recently, Barbarin and Aikens (2015) found teacher expectations were associated with student achievement as early as first grade. There is evidence that at-risk students, including those from low income or minority families, are impacted

more substantially by teachers' expectations that students who are not at risk (Sorhagen, 2013). Elliott and Grigorenko (2014) reported that lowered expectations for those with reading disabilities decreased teachers' efforts to provide additional instructional support.

Teachers base their instructional decisions on informal beliefs or judgments about students' academic performance and, to a lesser degree, formal assessment data (Griffith, 2017). Thus, teachers' beliefs play a critical role in daily decision-making regarding instructional materials, teaching strategies, and student learning groups. Teachers' judgments also influence expectations for student achievement, interactions between teacher and student, and student outcomes, (Begeny, Eckert, Montarello, & Storie, 2008). Begeny et al. (2008) also found that teachers often made incorrect judgments about students reading performance, particularly when evaluating low-performing or average readers, and often overestimated students' abilities. Sorhagen (2013) reported lower achievement on the Woodcock-Johnson reading subscale at age 15 among students whose teachers underestimated their ability in first grade than for students whose teachers made accurate estimates. Inaccurate teacher beliefs are detrimental to student learning opportunities and overall development. Although it is understood that teachers' beliefs influence students' reading proficiency outcomes, a more refined understanding of the relative importance of different types of beliefs is needed.

High-quality reading instruction in the primary grades has the potential to be the "single best weapon against reading failure" (Joshi et al., 2009, p. 393). Yet, current reading instruction practices in classrooms across the country contributed to the high rates of reading failure experienced by students in the United States (Lyon & Weiser,

2009). To improve reading outcomes, Cunningham et al. (2009) suggested further exploration of the impact teacher characteristics have on student reading outcomes. Based on my review of the literature, I selected four teacher-related constructs as the focus of this study: teacher knowledge, teacher beliefs, intention to provide evidence-based reading instruction, and background factors, including age, gender, education, and experience.

Teacher Knowledge

Extensive knowledge about language did not guarantee that teachers engaged in effective decision-making related to reading instruction (Gallant & Schwartz, 2009) nor did it guarantee improved reading outcomes for students (Lyon & Weiser, 2009; Podhajski et al., 2009). However, teachers' knowledge of pedagogy and content provided a critical foundation that allowed teachers to address the needs of beginning and struggling readers (Oliveira et al., 2019).

For reading teachers, *pedagogical knowledge* encompasses the instructional strategies that help students acquire the ability to read, or the *how* of instruction (Oliveira et al., 2019). Strategies for reading instruction that have been identified as evidence-based include: modelling fluent reading by reading aloud to students (Armbruster et al., 2009), providing students with regular opportunities to practice manipulating phonemes using letters of the alphabet (Brady & Moats, 1997); and applying knowledge of letters and sounds to read words, sentences, and stories (Duke & Block, 2012).

In contrast, content knowledge is the *what* of instruction – the understanding teachers need to convey to students that will allow them to become skilled readers (see

Oliveira et al., 2019). Reading teachers must have explicit knowledge of what language is and how it works. Moats (1994) went so far as to suggest that "knowledge of language structure is as fundamental to a reading teacher as anatomy is to a physician" (p. 99). Teachers who understand the developmental phases of the reading acquisition process and the nature of developmental delays can recognize when a student struggles to achieve a developmental milestone and respond appropriately (Snow, Burns, & Griffin, 1998). This knowledge also allowed teachers to recognize and take advantage of the diagnostic value of students' reading errors as a way to inform instruction and intervention (McMahan et al., 2019).

Current body of research on teacher knowledge. Muijs and Reynolds (2002) found that teacher knowledge had an impact on the effectiveness of instruction. Piasta et al. (2009) reported that teacher knowledge represented a contributing factor in students' reading proficiency outcomes. However, Lyon and Weiser (2009) identified a significant number of educators, including both classroom teachers and administrators, who lacked the knowledge and skill needed to incorporate evidence-based practices into adopted reading curricula. Continuing a trend that began as early as 1867, Davidson (2013) found that teachers did not use research findings to inform their classroom instruction with struggling readers.

In both correlational and pre- and posttest studies, researchers found teachers' pedagogical and content knowledge to be related to student outcomes in reading (Lyon & Weiser, 2009; McCutchen et al., 2009; Washburn, Joshi, & Cantrell, 2011). Using a mixed methods approach, McCutchen, Abbott et al. (2002) found that increases in

teachers' knowledge led to changes in classroom practices which contributed to improved student learning. In one of the few studies that employed an experimental research design, Podhajski et al. (2009) found that teachers could increase their knowledge of explicit reading instruction, and these increases contributed to students' growth in reading.

Researchers found, to be most effective, teachers should possess a broad content knowledge base (McCutchen et al., 2009) that is recent, current, and research based. They also need to know how to apply this knowledge to inform their instruction (Connor et al., 2014) with students who have diverse backgrounds and needs (Lyon & Weiser, 2009). Reading teachers, for example, need to demonstrate expertise in implementing a multi-faceted approach to reading instruction that includes explicit, sequential, and systematic instruction and timely, effective responses to struggling students throughout the reading acquisition process (Cunningham et al., 2009; Lyon & Weiser, 2009).

For this study, I measured teacher knowledge in two key content areas: basic language concepts and reading disabilities. Basic language concepts must be mastered to achieve basic reading proficiency (Washburn, Joshi, & Cantrell, 2011), and include: phonological awareness, phonemic awareness, decoding, alphabetic principle, and morphological awareness (McMahan et al., 2019). Knowledge of reading disabilities encompassed the causes, risk factors, symptoms, diagnosis, and treatment of common reading disabilities (Soriano-Ferrer & Echegaray-Bengoa, 2014).

Teacher knowledge of basic language concepts. A review of extant literature on teacher knowledge of basic language concepts indicated teachers' content knowledge is

lacking overall and in key areas. A variety of correlational studies have shown both preservice and in-service teachers lacked explicit knowledge of language and literacy essential to providing effective reading instruction for beginning and struggling readers (Moats, 2009b). Researchers found that teachers demonstrated a lack of understanding of terminology, (Washburn, Joshi, & Binks-Cantrell, 2011), lack of awareness of the specific elements of language they needed to teach explicitly (Moats, 2009b), and insufficient or inaccurate understanding of how to recognize and address the needs of struggling readers (Moats, 2009b; Ness & Southall, 2010; Washburn, Joshi, & Binks-Cantrell, 2011). Despite extensive research made public on the important role phonemic awareness plays in reading acquisition (Washburn, Joshi, & Cantrell, 2011), researchers confirmed that knowledge deficits in this essential component of reading persisted among teachers (Cunningham et al., 2009). Since at least 1994, studies of teacher knowledge have documented a lack of understanding about these basic language concepts and appropriate, effective pedagogical practices (Cunningham et al., 2009; Lyon & Weiser, 2009; Washburn, Joshi, & Cantrell, 2011).

The results of multiple studies indicated inaccurate self-assessment of linguistic knowledge, including phonemic awareness, phonics, morphology, and children's literature among preschool and elementary teachers (Cunningham et al., 2009; Moats, 2009b; Podhajski et al., 2009; Washburn, Joshi, & Binks-Cantrell, 2011). This trend is problematic because teachers who do not accurately perceive their own levels of expertise may be less likely to seek a deeper understanding of literacy and less receptive

to professional development offerings that could address gaps in knowledge related to effective reading instruction (see Lyon & Weiser, 2009; Podhajski et al., 2009).

Washburn, Joshi, and Cantrell (2011) suggested the picture of teacher knowledge and student achievement is incomplete. Teacher knowledge has not been operationalized consistently in research studies (Hagan-Burke et al., 2013; McCutchen et al., 2009). For example, Hagan-Burke et al. (2013) measured only phonemic awareness as an indicator of teacher knowledge, while Washburn, Joshi, and Binks-Cantrell (2011) included knowledge of both basic language concepts and dyslexia in their study. The lack of consistency in operationalizing the construct of teacher knowledge has complicated interpretation of research findings. Researchers have yet to fully document the influence of teacher knowledge on student achievement in reading and Robinson (2011) called for additional research documenting the distinct pedagogical and content knowledge base most effective in improving student achievement in reading.

Teacher knowledge of reading disabilities. As researchers made progress in documenting the reading acquisition process, they also developed a more comprehensive understanding of reading failure. Primary teachers are in a unique position to notice and respond when children begin to struggle with reading tasks. To do so, however, a primary teacher's professional knowledge base must include an understanding of the characteristics and warning signs of reading disabilities as well as knowledge of and skill in using a variety of effective intervention strategies (Washburn, Mulcahy, Joshi, & Binks-Cantrell, 2016).

Misconceptions about prevalence rates, causes and identification of, and interventions for children with reading disabilities, including dyslexia, persist (Jones, Holtgraves, & Sander, 2019). Furnham (2013) reported that lay people demonstrated curiosity and understanding mixed with ignorance and naivety about reading disabilities. In their seminal study, Wadlington and Wadlington (2005) reported that educators held a significant number of misconceptions about dyslexia and these mistaken beliefs persisted over time. For over 20 years, researchers have agreed that deficits in language processing, not general visual-perceptual deficits, characterize the most common reading disability, yet, teachers still get this question wrong on tests of dyslexia knowledge (Washburn, Joshi, & Binks-Cantrell, 2011). Misunderstandings about reading disabilities, including dyslexia, have not been successfully addressed through education or community awareness efforts (Soriano-Ferrer & Echegaray-Bengoa, 2014).

Although the terms dyslexia and reading disability are often used interchangeably, some researchers caution against this practice (Elliott & Gibbs, 2008). Starting in the late 1800s, professionals used the term *dyslexia* to distinguish struggling readers with average to above average intelligence from those with low intelligence and a diagnosis of dyslexia was based on a discrepancy between IQ and reading ability (Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992). As researchers developed comprehensive and accurate understanding of typical reading development, the distinction blurred between students thought to have dyslexia and those believed to have a reading disability (Torgeson, 2000). It is no longer appropriate to use IQ to differentiate struggling readers

because deficits in phonological processing are consistent among those with reading disabilities independent of IQ scores (Hancock, Gabrieli, & Hoeft, 2016).

Similar to being obsolete in educational settings, the value of using the term dyslexia as a scientific construct in research is limited (Elliot & Grigorenko, 2014). Because there is no consensus as to the exact definition of dyslexia among researchers (Phillips & Odegard, 2017), the term may lack scientific rigor and precision. Without a clear and consensual definition, stakeholder groups including parents, politicians, educators, and national and international organizations have the freedom to adopt a definition of dyslexia most beneficial to their agenda (Elliott & Grigorenko, 2014). Researchers found the continued use of a construct in which there is little agreement contributed to delays in or lack of services for struggling readers (Wadlington, Elliot, & Kirylo, 2008), limited or misinformation communicated to parents (Elliott & Grigorenko, 2014), and the high rates of reading failure the United States (Soriano-Ferrer & Echegaray-Bengoa, 2014). For these reasons, the term *reading disabilities* is used throughout the present study.

Teacher Beliefs

Beliefs, although difficult to define (Khonamri & Salimi, 2010), can be thought to represent that which an individual assumes is true (Hsiao, & Yang, 2010). Through formal and informal experiences and reflection, personal and professional knowledge contributes to the development of a highly-personalized belief system that filters perception, decision-making, and behavior (Khonamri & Salimi, 2010; Lee et al., 2010). For teachers, beliefs that existed at the onset of a teacher preparation program or

developed early in the program contributed to the development of a professional identity (Kumar et al., 2015). Leko et al (2015) found that teachers' belief systems were resistant to change over the course of professional preparation and teacher certification and into the classroom. Ajzen et al. (2011) reported that beliefs guide intentions and behavior even if inaccurate, incomplete, or biased.

Current body of research on teacher beliefs. Researchers found teachers' beliefs to be complex and multidimensional constructs (Hornstra et al., 2010; Khonamri & Salimi, 2010; Leko et al., 2015) and scientists have yet to fully understand the nuances of their impact. My review of the literature revealed empirical support for the influence of teachers' beliefs on classroom instruction (Casebolt & Hodge, 2010; Giorgi et al., 2013) and in turn, students' academic performance (Gwernan-Jones & Burden, 2010; Hall, 2009; Muijs & Reynolds, 2002).

Researchers found that the expectations teachers communicated to students, both implicitly and explicitly influenced students' academic performance. Klehm (2013) reported that students performed in accordance with their teacher's expectations and these expectations were based on the teacher's beliefs about the student. Using a multiple case study design, Scharlach (2008) found teachers' beliefs related to teaching struggling readers influenced their expectations and their instructional decisions, and both were aligned directly with their instructional practices. Teachers' beliefs about their perceived level of responsibility to ensure successful academic outcomes for students with disabilities also contributed to their instructional decision-making (Scharlach, 2008).

In another study, Woodcock and Vialle (2011) found teacher understanding and beliefs about students with disabilities influenced how they responded to students. The researchers found that teachers who believed their students' disabilities to be permanent, unalterable situations were more sympathetic and demonstrated less frustration with students than did teachers who thought they could help students overcome, at least in part, their disabilities (Woodcock & Vialle, 2011). In contrast, teachers who believed students' disabilities to be permanent had lower expectations and felt less responsible for ensuring successful academic outcomes.

Instructional decisions, including allotment of instructional time, also reflected teachers' knowledge and beliefs. Cunningham et al. (2009) used a mixed methods approach to explore how teachers would choose to allocate time to various aspects of language arts instruction including reading. They found great variety among teachers in relation to their experience, content knowledge, and self-reports of how they would spend a two-hour block of language arts instruction time, but little evidence that their teaching would reflect evidence-based recommendations for instruction (Cunningham et al., 2009).

Researchers found that teachers' beliefs influenced instructional behaviors independent of the accuracy of teachers' beliefs or disciplinary knowledge (Cunningham et al., 2009). Leko et al. (2015) suggested that mistaken beliefs about reading among preservice teachers could perpetuate "antiquated and ineffectual teaching practices" (p. 187). Inaccurate beliefs increased the likelihood of ineffective and even detrimental instructional approaches with struggling readers (Wadlington et al., 2008). Teachers'

whose knowledge or beliefs are inaccurate may not recognize early warning signs of reading difficulties and delay assessment and intervention.

Similar to the lack of consistency in operationalizing teacher knowledge, I found that researchers defined teacher beliefs in various ways in the literature I reviewed. Muijs and Reynolds (2002) found less consistency in the operationalization of teacher beliefs than in that of instructional behaviors. This trend may be due, in part, to the fact that instructional behaviors can be observed directly and represent a limited set of options, whereas there are infinite manifestations of teacher beliefs due to their individualized nature. Muijs and Reynolds recommended that researchers examining beliefs clearly state what is included and excluded relative to the construct of beliefs. One way to address this issue is to frame the study within the context of a particular theoretical framework (Russo et al., 2012). In the present study, the theory of planned behavior and the implicit theory of intelligence provided the theoretical context for the operationalization of the construct of teacher beliefs.

Teacher beliefs and the theory of planned behavior. Behavioral, normative, and control beliefs are indirect determinants of behavioral intention in the theory of planned behavior model (Ajzen, 1985). Beliefs are relevant to teachers' decision-making in general, and in content areas such as reading or mathematics (see Egloff et al., 2019). For example, beliefs about the effectiveness of an instructional strategy, the expectations and support of the school principal and parents, and the likelihood that the chosen strategy will succeed with a particular student all influence the instructional approach a teacher uses.

Behavioral beliefs. In the theory of planned behavior, behavioral beliefs encompass the perceived consequences of performing or failing to perform a given behavior (Ajzen, 2002). In the context of reading instruction, teachers' beliefs about the outcomes of teaching unfamiliar or important vocabulary before reading a selection of text is an example of behavioral beliefs. Moats (2009b) suggested behavioral beliefs in conjunction with teacher knowledge are important because teachers who do not fully understand the nature of reading acquisition may fail to realize the importance of providing research-based instruction to improve students' reading proficiency outcomes.

Normative beliefs. Students, parents, principals, communities, government agencies, and advocacy groups influence norms relative to reading instruction because they each have an interest in reading proficiency outcomes. Sadaf et al. (2012) found that students exerted a stronger influence on normative beliefs than did either parents or administrators. Across the United States, the pressure to perform well on state or federally-mandated performance assessments also contributed to teachers' normative beliefs and had implications for classroom instruction (Fulmer & Turner, 2014). Klehm (2013) suggested that some teachers responded to the pressure to perform well by focusing efforts on covering all expected course content at the expense of providing individualized instruction that met the needs of all students. Also, some teachers were reluctant to offer accommodations to struggling readers if they believed the student would be expected to pass the mandated assessment without this support (Klehm, 2013).

Control beliefs. Control beliefs are related to perceptions of the ease or difficulty of performing a particular behavior (Ajzen, 1991) and include two components:

controllability and *self-efficacy*. Controllability is defined as the autonomy one feels in choosing whether or not to perform a given behavior (Ajzen, 2002). A literature search did not reveal extant literature that examined controllability in the context of reading instruction. In contrast, self-efficacy, or personal beliefs about one's abilities (Ajzen, 1991), has been studied in depth.

Researchers have consistently found teachers' self-efficacy to predict instructional decisions and perseverance with students (Kosko & Wilkins, 2009) as well as contribute to increased effectiveness and innovation in instructional behaviors in the classroom (Haney, Lumpe, Czerniak, & Egan, 2002; Holzberger et al., 2013; Kunter et al., 2013). Kosko and Wilkins (2009) found that teachers who demonstrate high self-efficacy produced more successful academic outcomes and were more likely to meet the individual needs of students than teachers with low self-efficacy. Banks, Dunston, and Foley (2013) found teachers' self-efficacy was the primary predictor of teacher persistence when teaching struggling students, as indicated by efforts to differentiate instruction to meet students' needs. Additionally, teachers with strong positive self-efficacy beliefs were more likely to require students to apply their knowledge, challenge students' thinking, and focus on providing opportunities for high-level thinking (Banks et al., 2013).

As indicated in the theory of planned behavior model, self-efficacy appears to be influenced by background factors including knowledge and experience. Kraut, Chandler, and Hertenstein (2016) found teachers who reported higher levels of preservice training and professional development also reported stronger self-efficacy beliefs than those with

less training and professional development. Holzberger et al. (2013) identified fluctuation in self-efficacy beliefs throughout the school year, even among experienced teachers, as a result of successful instructional experiences. Feng, Hodges, Waxman, and Joshi (2019) reported that preservice teachers had moderate to high self-efficacy before they started teaching, but their self-efficacy dropped sharply during their first year of teaching.

In the context of reading instruction, teachers' self-efficacy represents the perceived ability to provide instruction that results in successful reading acquisition outcomes for students (Banks et al., 2013). Scharlach (2008) found teachers' self-efficacy was directly aligned with their instruction for struggling readers: Reading teachers with high self-efficacy and high responsibility were more likely to believe all students could learn to read and felt responsible for providing additional instruction. In contrast, teachers with low self-efficacy and low responsibility tended to believe some students would not be able to learn to read regardless of the type and amount of instruction they provided (Scharlach, 2008). Furthermore, the teachers with low self-efficacy and low responsibility were more likely to place responsibility for teaching these students to read on someone else or blame factors related to the student for the reading difficulties (Scharlach, 2008). These results indicate a possible link between teacher's self-efficacy beliefs and their implicit theory of intelligence.

Self-efficacy can influence reading instruction in other ways. Cunningham et al. (2009) found evidence that teachers' beliefs about their knowledge of and skill in completing literacy tasks influenced their reading instruction with students. Teachers who lacked understanding about the characteristics and causes of reading and other learning

disabilities held incorrect beliefs about effective intervention strategies and believed they did not have the ability to help students with disabilities succeed (Kosko & Wilkins, 2009). Scharlach (2008) found that preservice teachers did not feel confident in their ability to teach all of their struggling readers to read, nor did they feel they would be able to teach a student with a reading disability how to read.

The current body of research on teacher beliefs and the theory of planned behavior. Researchers who employed the theory of planned behavior in educational settings produced mixed results. Some researchers found all variables to significantly predict behavioral intention (Jeong & Block, 2011; Lee et al., 2010), whereas others identified a subset of variables to significantly predict behavioral intention (Demir, 2010; MacFarlane & Woolfson, 2013; Richardson et al., 2012; Sadaf et al., 2012; Teo & Lee, 2010). Inconsistent application of the theory of planned behavior may have contributed to inconsistent results.

In the studies I reviewed, I noted inconsistency in application of the theory, operationalization of constructs, and other factors. In many studies, a subset of categories of beliefs was examined instead of the full model. Researchers indicated they used the theory of planned behavior model as a framework to examine only teachers' self-efficacy (Banks et al., 2013; Gibbs & Powell, 2012; Holzberger et al., 2013; Kosko & Wilkins, 2009); however, self-efficacy is one component of one category of beliefs. Other researchers used all of the categories of beliefs to examine the relationship between the predictors and behavioral intention (Gwernan-Jones & Burden, 2010; Hodge et al., 2009; Huang, 2006).

Failure to consistently operationalize constructs within the theory of planned behavior model for use in educational settings also contributed to inconsistent findings (MacFarlane & Woolfson, 2013). Giorgi et al. (2013) used the theory of planned behavior to examine the relationship between teacher beliefs and behavior but did not use Ajzen's (2002) descriptions in their operationalization of beliefs. Leko et al. (2014) suggested the "need to be more specific and explicit when describing studies of PSTs' [preservice teachers'] beliefs" (p. 186) whereas Holzberger et al. (2013) suggested "the more specifically self-efficacy beliefs are measured, the better they predict future behaviors" (p. 783).

Other factors may have contributed to the pattern of inconsistent findings. For instance, Cunningham et al. (2009) suggested the use of a Likert-type scale that asks teachers to indicate their beliefs by choosing from opposite ends of a spectrum may have produced inaccurate or misleading data. Many of the studies included in this review of the extant literature were carried out with preservice teachers. Preservice teachers' responses to questions about their instructional behaviors are hypothetical because they have limited experience providing instruction in a classroom of students. Although this population may be more accessible to researchers, preservice teachers' lack of classroom experience may have resulted in findings that differed from results of studies that included in-service teachers as participants.

Teacher beliefs and implicit theory of intelligence. The study of implicit theories began as an attempt to understand student motivation (Blackwell et al., 2007; Dweck, 2000) and efforts to examine the impact of teachers' implicit theory of

intelligence are more recent. To date, most studies used self-report strategies to capture teachers' beliefs (Shim et al., 2013), and focused on teachers' beliefs about students' intelligence (Fischbach, Baudson, Preckel, Martin, & Brunner, 2013; Jones, Bryant, et al., 2012) or beliefs about students with disabilities (Klehm, 2014). In one study, Leko et al. (2014) examined how teachers' beliefs changed over the course of their teacher preparation programs.

A teacher's beliefs about students' intelligence influence instructional decision-making from the first decision on the first day of a new school year. Teachers who believe and expect a student will learn are more likely to expend additional effort to help the student because the teachers see value in their efforts (Klehm, 2014). When reporting the results of their unpublished dissertations, both Strosher (2003) and Seibert (2006) indicated a positive correlation between teachers' incremental theory of intelligence and self-efficacy. Gutshall (2013) found that teachers who believed they could improve their instruction also had higher self-efficacy beliefs.

Teachers' implicit theory of intelligence has been shown to influence teachers' work with students who have reading and other disabilities. Elliott and Grigorenko (2014) indicated that teachers demonstrated lowered expectations for students diagnosed with reading disabilities and expended less effort to provide supplemental instruction. Hornstra et al. (2010) found that teachers' beliefs about the permanency of students' disabilities and their level of responsibility for helping the students overcome their disabilities affected instructional decision-making and expectations for students who had disabilities. Although Hornstra et al. did not explicitly use the implicit theory of

intelligence framework, their conceptual definition of beliefs was consistent with that described in Dweck's (2006) theory.

Researchers who investigated whether teacher preparations programs could affect behavioral change by altering preservice teachers' beliefs reported mixed results (see Leko et al., 2014; McCutchen, Abbott, et al., 2002; McCutchen, Harry, et al., 2002; Podhajski et al., 2009). The findings of studies that examined teachers' beliefs about students' intelligence or students with disabilities were more consistent and researchers consistently found lowered expectations and assessments of performance (Klehm, 2013) and inaccurate judgments about students' intelligence or ability (Jones, Bryant, et al., 2012).

Scharlach (2008) called for additional research to further understanding of the influence of teachers' beliefs about struggling readers on their teaching behaviors. In particular, researchers suggested further examination of the impact of teachers' beliefs on the selection of instructional strategies (Egloff et al., 2019) and on outcomes for students (Casebolt & Hodge, 2010; Fischbach et al., 2013; Gutshall, 2014). Leko et al. (2014) recommended that studies examining teachers' beliefs should be grounded in specific disciplines and explicit in regard to the particular beliefs under investigation and the methodology.

Instructional Behaviors

Decades of research examining instructional behaviors resulted in the identification of teacher practices, in relation to both content and delivery, that are most likely to result in student learning (Reddy et al., 2013). Practices identified as effective

included using evidence-based instruction, conducting formative and summative assessments, using data to identify struggling students and inform instruction, and providing interventions that target students' unique deficits (Griffiths & Stuart, 2013).

Providing evidence-based reading instruction is critical to producing successful reading proficiency outcomes for beginning and struggling readers (Cunningham et al., 2009; Oliveira et al., 2019; Reddy et al., 2013). Researchers indicated that evidence-based reading instruction is explicit, systematic, and sequential (Spear-Swerling, 2019). Teachers who provide explicit instruction articulate the skills and knowledge that students need to master, the importance of each component, and the relationships between specific skills or knowledge (Birsh & Schedler, 2011). Explicit reading instruction is characterized by active engagement of students, concrete and visible explanations of reading concepts, clear and concise directions and language, multiple examples, and teacher modeling. Systematic reading instruction gives students opportunities to learn and build foundational skills over time as teachers provide regular and specific feedback to students (Duke & Block, 2012). New concepts and skills are first introduced and practiced in isolation; then, as students develop proficiency, teachers help students make connections to other skills and concepts. Teachers who provide sequential reading instruction initially focus on core competencies and knowledge in each of the components of reading then provide opportunities to build on this foundation in a logical way by adding more sophisticated skills and knowledge (Brady & Moats, 1997).

Effective reading teachers present concrete strategies for each of the five components of reading, model their use, and provide ample opportunities for students to

practice applying these strategies (Podhajski et al., 2009; Washburn, Joshi, & Binks-Cantrell, 2011). Instruction in phonemic awareness guides students in developing the ability to hear, identify, and manipulate the individual speech sounds in words (McMahan et al., 2019) whereas phonics instruction focuses on helping students understand the relationships between written letters and spoken words (Aro & Björn, 2015). Fluency instruction involves modeling fluent reading for students and giving students opportunities to build fluency by offering constructive feedback as students read the same passage out loud multiple times (Snow et al., 1998). Most vocabulary development is indirect, as students read independently, engage in conversation, and listen to adults read (Nagy & Scott, 2000); however, students must also have the opportunity to learn vocabulary directly through explicit instruction on the meaning of specific words and word learning strategies (Pullen et al., 2011). When teaching text comprehension strategies, teachers present different strategies and help students understand why, when, and how to use each (Accardo & Finnegan, 2019).

Current body of research on instructional behaviors. Researchers have examined the relationships among various teacher-related factors, the use of effective instructional behaviors, and student achievement. Cunningham et al. (2009) cautioned that “research-based practices will not be employed widely, nor with fidelity, until teachers’ knowledge and beliefs are congruent with the instructional practices recommended by research and policy consensus” (p. 429). Kumar et al. (2015) demonstrated that conscious and unconscious processes influenced teachers’ selection and use of instructional practices. Reddy et al. (2013) reported that the skill, frequency,

and degree to which teachers implemented effective instructional practices impacted students' academic achievement. Furthermore, Muijs and Reynolds (2002) found the teacher factors most proximal to students had the greatest impact on student achievement.

Research indicated all students learning to read benefit from instruction based on current research findings (Davidson, 2013; Piasta et al., 2009); however, evidence-based instruction is more critical for those students who struggle with reading acquisition (Moats, 2009a). Sharp et al. (2016) reported that teachers' use of evidence-based instructional practices was one of the strongest predictors of successful reading proficiency outcomes for students. Haney et al. (2002) found that teachers' knowledge of and beliefs about reading disabilities impacted their instructional practices as well as the quality of their instruction. Empirical evidence supports the value of direct and explicit instruction in phonics and phonemic awareness, vocabulary, comprehension strategies, (Stark et al., 2016), and in developing conceptual and content knowledge reading outside of school (Duke & Block, 2012). Connor et al. (2014) reported that teachers should go beyond requiring rote memorization of words and their definitions to provide rich contextual experiences with words and word meanings. Finally, Al Otaiba et al. (2016) reported the vast majority of students can learn to read when their teachers provide evidence-based instruction.

Although the characteristics and content of effective reading instruction are clear, one of the most consistent findings related to teachers' instructional behaviors is that there is a disconnect between research and practice (Kuzborska, 2011; Piasta et al., 2009; Seidenberg, 2013). Cunningham et al. (2009) found that instructional practices did not

reflect recommendations from current research, national reports or education policy and Al Otaiba et al. (2016) reported that few teachers were familiar with evidence-based reading instruction. In another study, Spear-Swerling et al. (2016) found that teachers in the United States and Portugal provided limited or no instruction in critical components of literacy, including phonemic awareness and phonics. Utilization of research findings varies widely, and researchers have found differences between general education and special education teachers (Davidson, 2013; Klehm, 2014), teachers working in Title I and non-Title I schools (Stichter et al., 2009), and teachers who teach different subjects (Klehm, 2014). Cunningham et al. also found allocation of instructional time was based on teachers' philosophical beliefs about teaching reading and did not reflect research recommendations related to reading instruction.

Both quantitative and qualitative approaches have been used to examine teachers' instructional behaviors. Most quantitative studies focused on collecting information about the processes of instruction, for example, the amount of instructional time spent in various groupings (Stichter et al., 2009) or the relationship between teacher beliefs and classroom practice (Khonamri & Salimi, 2010). Many qualitative studies attempted to understand implementation aspects of instruction, for instance, the degree to which teachers actively involved students in instructional activities (see Peabody, 2011). Some researchers, including those interested in examining multiple aspects of teaching and learning how to read, used a mixed methods approach. Many of these studies relied on self-report data (Jeong & Block, 2011; Khonamri & Salimi, 2010; Klehm, 2014; MacFarlane & Woolfson, 2013) which can be a limitation (Washburn, Joshi, & Binks-

Cantrell, 2011); however, researchers who collected observational data on instructional behaviors found similar results (McCutchen, Abbott, et al., 2002; Stichter et al., 2009).

Researchers also examined teacher-level interventions. McCutchen, Abbott et al. (2002) found interventions at the teacher level could be successful in improving student outcomes. Lee et al. (2010) applied the results of studies using the theory of planned behavior to design effective interventions that changed instructional behaviors. Ajzen (2011) made clear that, although theories regarding additional predictive factors were not included in the theory of planned behavior model, nevertheless, they could enhance the model. Ajzen went on to suggest that these types of theories presented an opportunity to clarify further the predictors of a given behavior. Researchers have called for additional research examining how teachers' implicit theory of intelligence influences communication and behavior in a classroom setting (Jones, Bryant, et al., 2012), particularly in relation to students with disabilities or other learning difficulties (Rattan et al., 2012).

I identified two primary limitations in the extant literature on instructional behaviors. First, similar to the other variables I examined in the current study, inconsistency in defining and measuring instructional behavior presented an issue. The research question under investigation informs the operationalization of the construct, so it is not likely there will be one universal definition of instructional behavior. Second, much of the research on instructional behaviors focuses on a single aspect or a limited set of factors. Researchers have begun to understand the complex relationship between teaching and learning how to read, but further investigation is needed (Washburn et al., 2014),

particularly research that addresses multiple factors simultaneously (Muijs & Reynolds, 2002).

Teacher-Related Background Factors

In the present study, I examined the relationships among teacher beliefs, teacher knowledge, and intention to provide evidence-based reading instruction. Additional teacher-related factors have been shown to have an impact and are often included as covariates in an attempt to control for their possible influence (Klehm, 2014). I identified four relevant teacher-related background factors: age, gender, education, and experience. Age and gender are relatively straightforward; however, education and experience require clarification in the context of this study.

Researchers have focused on multiple aspects of teacher education and experience. Banks et al. (2013) included experience in various school settings (urban, suburban, rural, and residential) in their study. Stichter et al. (2009) collected data on demographic variables (gender and age) along with teacher-related factors (years of teaching, highest degree obtained, average class size, and grade level taught the previous semester). Begeny et al. (2008) measured the number of years teaching, grade levels taught, professional training (master's level degree/National Board Certification vs. none) and training in reading fluency. Hodge et al. (2009) included teacher-related factors (years of teaching experience, years of teaching students with disabilities in PE classes, number of undergraduate teaching courses, number of graduate level teaching courses, and number of professional development opportunities) and student-related characteristics (average class size, range in number of students with disabilities per class).

Researchers described a variety of relationships between teacher education or experience and other variables. In their study, MacFarlane and Woolfson (2013) found teacher experience, in terms of number of years teaching, negatively predicted willingness to work with students with emotional and behavioral disabilities. Additional certifications or designations, such as highly qualified status according to No Child Left Behind parameters, were not found to make a difference in terms of reading outcomes for students with disabilities (Robinson, 2011). Similarly, Kosko and Wilkins (2009) found that professional development (included in some studies as an indicator of education or experience) was better predictor of teachers' perception of their ability to work with students with identified disabilities than the number of years of teaching experience.

Studies that examined teacher experience in relation to teachers' implicit theory of intelligence produced mixed results. Researchers have found considerable variation in the implicit theory of intelligence among teachers in the United States (García-Cepero & McCoach, 2009; Jonsson et al., 2012), particularly when comparing age (Jones, Bryant, et al., 2012) and years of teaching experience (Gutshall, 2013). Jones, Bryant et al. (2012) found teachers with more experience were more likely to have a stronger entity theory than incremental theory. Cunningham et al. (2009) recommended that future studies include measures of the type of experience, whether teaching experience is in general or special education classrooms, and the number of years of teaching experience.

For this study, I conceptualized education as the degree obtained by the teacher (bachelors, masters, or doctorate) and the completion of any additional certifications such as a reading certificate or reading specialist credential. Preparation programs and

certification processes are intended to ensure teachers possess a foundational level of knowledge and skill that will allow them to be successful in the classroom with students (Feng et al., 2019). By design, therefore, these programs and processes influence teacher knowledge, beliefs, and instructional behaviors.

In the current study, I measured experience in terms of number of years and type of experience. Participants identified how many years they taught at each grade level (transitional kindergarten through third grade). I also collected data on the type of school (public, private, magnet, or charter), school setting (urban, suburban, or rural), and type of educational program (general or special education settings) in which participants had worked.

Researchers have yet to understand the implications of teacher-related background factors on instructional decision-making, and, in turn, students' academic outcomes. Therefore, it is important to include variables such as age, gender, experience, and education in studies examining teaching or learning.

Summary and Conclusions

Several major themes emerged from my review of the literature. Scientists understand the developmental progression of reading acquisition (Snow et al., 1998) and the instructional strategies most conducive to successful reading proficiency outcomes for students (Reddy et al., 2013). Teachers play in integral role in students' reading acquisition and there is a foundational body of profession-specific knowledge of content and pedagogy teachers must possess if they are to be successful (Oliveira et al., 2019). However, there is considerable empirical evidence indicating that most teachers do not

possess the requisite explicit knowledge of basic language concepts and reading disabilities (Soriano-Ferrer & Echegaray-Bengoa, 2014; Wadlington & Wadlington, 2005; Washburn et al., 2014; Washburn, Joshi, & Cantrell, 2011) nor do they provide evidence-based reading instruction (Kuzborska, 2011; Piasta et al., 2009; Seidenberg, 2013).

Teacher-related factors have been shown to influence instructional practices, but further research was needed to clarify the relationships between inherent characteristics of teachers and their intention to provide evidence-based reading instruction (see Cunningham et al., 2009; McCutchen et al., 2009). The present study addressed the identified gap in the literature by examining the relationships among teachers' knowledge, beliefs, and instructional behaviors. In addition, this study examined the usefulness of combining two established theoretical frameworks to understand better the patterns of teacher-related factors that predicted behavioral intention.

In Chapter 3, I will describe the methodology of the study, focusing on participant selection, recruitment, and protection; data collection methods and instruments; and data analysis strategies. In addition, I will describe internal and external threats to the validity of the study and provide an explanation of how I maintained ethical principles throughout the study.

Chapter 3: Research Method

Introduction

The purpose of this quantitative, correlational study was to examine the degree of predictive relationship between teacher-related factors and intention to provide evidence-based reading instruction using a conceptual framework that integrated the theory of planned behavior and implicit theory of intelligence. Teacher-related factors were the independent variables and included teacher knowledge and teacher beliefs. The dependent variable was intention to provide evidence-based reading instruction.

In this chapter, I describe the methodology for the study, potential threats to the validity of the study, and the ethical procedures followed in designing and carrying out the study. The methodology section provides information about the study sample including participant selection and exclusion criteria, justification for the sample size, description of the recruitment procedure, clarification of the study variables, and explanation of the data collection and analysis procedures including a description of the pilot study. In the next section, I describe internal and external threats to validity and how these threats were addressed. Lastly, the ethical procedures section details the decision-making and implementation practices that ensured participants did not suffer any ill effects as a result of participating in the study and that they were otherwise protected from harm when sharing their data.

Research Design and Rationale

The present study was designed to examine the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based instructional

practices for reading. I used a quantitative approach and a cross-sectional, correlational survey design to examine the relationships between the independent and dependent variables. In the paragraphs that follow, I describe each of these elements and their alignment to the research question, identify time or resource constraints, and explain how the element was consistent with what is needed to advance knowledge in the field of educational psychology.

A quantitative approach was most appropriate because it allowed for collection and statistical analysis of data related to specific variables, in this case, teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction. Researchers have identified relationships between teacher characteristics, such as teacher knowledge or teacher beliefs, and their instructional behaviors in the classroom (McMahan et al., 2019). Furthermore, researchers have reached consensus on the set of instructional strategies most effective with beginning and struggling readers (Cunningham et al., 2009). The intent of this study was not to explore factors that might influence teacher intention or instructional strategies that are most effective for beginning and struggling readers, but rather to examine the predictive relationships between these factors and teachers' intention to provide evidence-based reading instruction.

The present study was an initial examination of the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction using a conceptual framework that integrated the theory of planned behavior and implicit theory of intelligence. This study was not designed to examine the effect of an intervention on teacher-related factors. Teacher knowledge and teacher beliefs remain

relatively stable over time (Leko et al., 2015) and the study was intended to measure teacher knowledge and beliefs at one point in time and to make between-participants comparisons. Therefore, a cross-sectional approach was appropriate. Future research that expands on the present study by including manipulation, control, and before-after comparisons could be conducted to establish causality between variables (see Frankfort-Nachmias & Nachmias, 2008).

The purpose of the correlational study was to determine the degree to which a relationship existed between teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction. Multiple regression analysis enabled me to determine the predictive relationship between the independent and dependent variables. A correlational design was consistent with the need to advance knowledge of reading instruction because it was unclear whether integrating the theory of planned behavior and implicit theory of intelligence would increase the predictive validity of the theories in explaining the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction.

I used an online survey to collect data related to the variables of interest in the study. The benefits of using an online survey include efficient and accurate data collection and entry, and reduction or elimination of some ethical concerns (Heen, Lieberman, & Miethe, 2014). Data collection was efficient, and data entry was accurate because participants entered their own data by responding to survey questions. This approach also allowed for noncoercive recruitment of teachers with little fear of retaliation or other negative consequences resulting from opting out of the survey.

Additionally, although it was not possible to observe the knowledge, beliefs, or intentions of teachers directly, teachers were able to self-report these data through an online survey (see Oluka, Nie, & Sun, 2014). Online surveys are common in the field of education, and many teachers are familiar with and comfortable providing information in this format. Gray, Thomas, and Lewis (2010) reported that approximately 97% of teachers in the United States have access to e-mail and the Internet.

Although there are many benefits to online surveys, this approach has limitations (Creswell, 2014). The type of data that can be collected with a survey is limited. In the present study, self-report survey data on intention to provide evidence-based reading instruction were collected instead of observational data documenting the use of the identified strategies. In survey studies, researchers must rely on the data provided by the participants and do not have an opportunity to ask clarifying questions or request additional information. Despite these limitations, the benefits of using an online survey outweighed the limitations. An online survey was useful in improving understanding of the factors that influence instructional decisions. This understanding may allow educators to make more effective decisions to improve reading proficiency outcomes.

Methodology

Population

According to the National Center for Education Statistics (as cited in McFarland et al., 2018), there were approximately 4.6 million teachers in the United States during the 2015-2016 school year, and approximately 1.9 million taught in elementary schools. Teachers working in kindergarten through third-grade classrooms are responsible for the

bulk of reading instruction, which requires an extensive knowledge base to be effective (Joshi, 2003). During these primary years, many students struggle with reading acquisition (Jones et al., 2019). However, they do not fall far enough behind to qualify for special education services and remain in general education classrooms under the guidance of general education teachers. The target population for the present study (primary teachers) was limited to the United States because the education policies and practices, as well as the content of teacher preparation programs and professional development opportunities, are unique.

Sampling Procedure

A convenience sample was used for this study for several reasons. First, a list of all primary teachers in the United States does not exist, so selection could not be random. A convenience sample allowed for the collection of data from a diverse group of teachers. Also, the study was an initial examination of the variables of interest to determine whether there was a correlation. A convenience sample was appropriate for the collection of these initial data. If further experimental research is conducted, a more sophisticated approach to sampling could be used.

The original sampling procedure involved e-mailing an invitation to take part in the study to a random group of individuals participating in SurveyMonkey Audience. These individuals lived in the United States, had Internet access, and voluntarily signed up to take a variety of surveys to raise money for identified charities and for a chance to win sweepstakes (SurveyMonkey Inc., 2011). All SurveyMonkey Audience participants complete an initial questionnaire that solicits various demographic data. It was possible to

limit invitations to those who partially met the selection criteria for the study (e.g., those who identified educator as their job function). However, it was not possible to limit invitations to primary teachers working in general education classrooms in the United States. Therefore, I included screening questions at the beginning of the survey to ensure the target population was included.

To estimate the appropriate sample size, I conducted an a priori power analysis using G*Power 3.1. I used multiple regression analysis to determine the relationship between six independent variables and the dependent variable (intention to provide evidence-based reading instruction). The six independent variables were knowledge of basic language concepts, knowledge of reading disabilities, behavioral beliefs, normative beliefs, control beliefs, and mind-set beliefs.

G*Power 3.1 includes Cohen's $f2$ as an effect size measure for multiple regression analysis, and I set the value at .15, a medium effect size (see Field, 2013). Frances et al. (2004) reported that it is "reasonable to assume at least a moderate effect size for theory of planned behavior studies using multiple regression analysis" (p. 29). MacFarlane and Woolfson (2013) used a medium effect size in their multiple regression analysis of teacher attitudes and behavior toward the inclusion of children with social, emotional, and behavioral difficulties in mainstream schools. I set both the power and alpha levels to their conventional values, .80 and .05 respectively. Using these inputs (number of variables, effect size, power, and alpha) produced a statistically appropriate sample size of 68 participants. To reduce instability in estimates of the regression line and increase the likelihood of replication, Field (2013) recommended a sample size for

multiple regression analysis be at least 10 to 20 times as many participants as variables, in this case, between 60 and 120 participants. The calculated sample size fell within this range.

Procedures for Recruitment, Participation, and Data Collection

Recruitment procedures. One benefit of using an online survey was that recruiting procedures could be built into the survey. During the pilot study phase, I used SurveyMonkey Audience to recruit participants based on a specific attribute: job function. In designing the online survey, I indicated that e-mail invitations should be limited to potential participants who listed educator as their job function. SurveyMonkey randomly selected panel members who met this criterion and sent them an e-mail to let them know they were invited to take a survey. Only those participants who chose to respond were included, a potential limitation of the study. Another limitation was that I did not know how many invitations were sent out, so I could not determine response rate or whether there were significant differences between those who responded and those who did not. As a result, I interpreted the findings of this study within the context of the study (see Washburn, Joshi, & Binks-Cantrell, 2011) and limited generalizations to those who are similar to study participants.

I used demographic questions to collect data on age, gender, education, experience, type of school, and school setting. Education included the highest degree, major, certifications, and endorsements such as reading specialist, special education credential, teaching credential, or administrative credential. Experience included years teaching each grade and years teaching in general education/special education. The four

types of schools were public, private, magnet, and charter. There were three categories of school settings: urban, rural, and suburban.

Provision of informed consent. I embedded the informed consent process into the online survey design. When accessing the online survey, potential participants were first taken to a page with informed consent information. Potential participants had as much time as needed to review the content. To protect the privacy of participants, I did not require a signature to give consent. Instead, participants were instructed to print a copy of the page for their records and click on a button to indicate consent or declination. Those who acknowledged their understanding and indicated they gave their informed consent were taken to the first screening question. Potential participants who choose not to provide informed consent were taken to the exit screen where they were thanked for their time.

The informed consent information was clearly written and organized into the following sections: information about the study, information relevant to the participants, and additional information. Information about the study included a description of the study and inclusion criteria, the purpose of the study, and the study procedures including an estimated time to complete and sample questions. Information relevant to the participants informed potential participants of the voluntary nature of the study, the right to end participation at any point without a threat of retribution, the potential risks and benefits of participation, the lack of monetary reimbursement for participation, and the procedures in place to ensure privacy. Additional information included my contact information and contact information for the research participant advocate. Following the

informed consent information, I asked participants to indicate whether or not they understood the information and consented to participate in the study.

Method of data collection. I combined the items from three published instruments and one researcher-created instrument into an online survey to collect data on the independent and dependent variables. Teacher knowledge was measured using two published instruments - Teacher Knowledge Survey of Basic Language Concepts (Binks-Cantrell, Joshi, & Washburn, 2012) and Knowledge and Beliefs about Developmental Dyslexia scale (Soriano-Ferrer & Echegaray-Bengoa, 2014). Teachers' implicit theory of intelligence was measured using the mind-set survey created by Dweck (2000). Teachers' behavioral, normative, and control beliefs, and teachers' intention to provide evidence-based reading instruction were measured by a researcher-created survey, Reading Teacher Beliefs and Instructional Intentions (see Table 1).

Table 1

Overview of Constructs and Measures

	Construct				
	Knowledge – language	Knowledge – reading disabilities	Beliefs – behavioral, normative, and control	Beliefs – mind-set	Intention
Instrument	Teacher Knowledge Survey of Basic Language Constructs	Knowledge and Beliefs about Developmental Dyslexia scale	Reading Teacher Beliefs and Instructional Intentions survey	Implicit Theory scale - Intelligence	Reading Teacher Beliefs and Instructional Intentions survey
Items	27-item inventory	36-item scale	21-item survey	3-item survey	21-item survey
Type of scores produced	Perception (8 items) and knowledge and skill (19 items) related to basic language concepts	Knowledge and beliefs about developmental dyslexia in three areas – general information, symptoms & diagnosis, and treatment	Behavioral, normative, and control beliefs	Beliefs about the nature of intelligence	Behavioral intention to use best instructional practices for reading

Heen et al. (2014) found online surveys to be a viable option for academic research. In this study, the online survey provided an impersonal method of data collection for data that could be considered sensitive (see Sue & Ritter, 2012). When participants may have perceived their answers to reflect poorly on their professional competence, as is the case when measuring teacher knowledge, the online survey offered anonymity. I did not target vulnerable populations, and by the nature of the inclusion criteria, excluded minors from participating in the online survey because individuals must be 18 or over to obtain a teaching credential. Lastly, I did not track Internet provider (IP) addresses so participants answering questions on the online survey remained anonymous, which eliminated the potential for conflict of interest and perceived coercion to participate.

Exiting the study and follow-up procedures. The protocol for exiting the study was integrated into the online survey design within the SurveyMonkey platform. I set up the survey so that, upon completion of the final question, participants were taken to an exit page where they were thanked for their time and provided with my contact information and contact information for the research participant advocate. I also provided a link to the Walden Library website where completed dissertations are made available.

Information About the Pilot Study

I used three published instruments to measure teacher knowledge of basic language concepts and reading disabilities and teachers' implicit theory of intelligence. However, an instrument did not exist to measure the combination of teacher beliefs and intentions I examined in this study. Therefore, I developed the Reading Teacher Beliefs

and Instructional Intentions (RTBII) survey to collect data on these variables (See Appendix A). Oluka, Nie, and Sun (2014) recommended that researchers using a theoretical framework based on the theory of planned behavior provide a detailed account of the survey development process. In the paragraphs that follow, I describe the process I followed in developing the RTBII survey and conducting the pilot study to detect any problems with survey questions or procedures.

I developed the RTBII survey in accordance with the guidelines provided by Ajzen (2006) and Francis et al. (2004). The steps in the development process included:

1. Defining the behavior.
2. Specifying the research population.
3. Formulating items for the direct measurement of each construct.
4. Administering the pilot survey.
5. Revising and finalizing the survey based on the results of the pilot study.

During Step 4, I used the SurveyMonkey platform to recruit participants and collect data. A total of 25 participants from the target population completed the RTBII survey. Although other researchers have suggested 30 or more participants, Frances et al. (2004) recommended a sample size of 25 for the pilot study of a theory of planned behavior survey. The inclusion and exclusion criteria previously described remained the same for the pilot study with one additional exclusion criterion: Those who indicated that they participated in the pilot study were excluded from the main study. I asked pilot study participants to answer four additional questions. These questions were designed to gather

information about the clarity of the questions, the clarity of the instructions, and any difficulty answering questions or understanding what kind of answers were expected.

I used the results of the pilot study to inform revisions to the RTBII survey. First, I examined nonresponse rates to identify potential patterns in unanswered questions. I also reviewed response distributions to determine if there was sufficient variety in participants' answers. I studied the length of time needed to complete the RTBII and the length of time it took to collect the minimum number of responses needed to complete the pilot study. The data collected during the pilot study phase were analyzed to determine validity (face, construct, and content) and reliability of the RTBII survey based on internal consistency assessed by Cronbach's alpha.

Instrumentation

Teacher Knowledge Survey of Basic Language Constructs. The Teacher Knowledge Survey of Basic Language Constructs (Binks-Cantrell, Joshi, & Washburn, 2012) was designed to measure teacher knowledge about basic language constructs. It was appropriate for the current study for several reasons. This survey could be administered in an online format. The items on the survey assessed both knowledge of and skill in using basic language constructs (Zhao, Joshi, Dixon, & Huang, 2016) including phonological awareness, phonemic awareness, alphabetic principle (phonics), and morphology. The survey allowed for statistical analysis of overall scores as well as individual item scores within and between groups. The Teacher Knowledge Survey of Basic Language Constructs was relatively short compared to other similar measures, which helped keep the total number of items for all variables reasonable. In addition, the

psychometrics of this instrument have been studied and reported on by multiple researchers (Stark et al., 2016; Washburn, Binks-Cantrell, et al., 2016). Prior to using this instrument, I obtained written permission from the developer.

Binks-Cantrell, Joshi, and Washburn (2012) refined earlier surveys of teacher knowledge as the basis for the Teacher Knowledge Survey of Basic Language Constructs. They conducted a pilot study with 114 teacher educators and 172 preservice teachers using an online format. The results of the pilot study were analyzed for item difficulty, item discrimination, performance score patterns, and reliability. Binks-Cantrell, Joshi, and Washburn found the reliability to be 0.90 using Cronbach's alpha, an acceptable score for research purposes and an indication of high internal consistency among scores.

Washburn, Joshi, and Binks-Cantrell (2011) used the Teacher Knowledge Survey of Basic Language Constructs in their examination of elementary teachers' knowledge of basic language concepts and knowledge and misconceptions about dyslexia. Using Cronbach's alpha, reliability for the entire scale was found to be 0.903 and 0.743 for the items included in their study. More recently, Sayeski et al. (2015) used the Teacher Knowledge Survey of Basic Language Constructs in their examination of 76 students enrolled in a course on special education topics at a university in the southeastern United States. Using Cronbach's alpha, the researchers found good internal consistency, 0.825, for the post-test and 0.826 for maintenance.

Knowledge and Beliefs About Developmental Dyslexia. I used the Knowledge and Beliefs about Developmental Dyslexia scale (Soriano-Ferrer & Echegaray-Bengoa,

2014) to examine knowledge and beliefs about developmental dyslexia in three areas: general information, symptoms and diagnosis, and treatment. This scale was appropriate for the present study because it was designed for use with teachers and was comprehensive without being lengthy. The Knowledge and Beliefs about Developmental Dyslexia scale was developed recently, so it reflected current understanding of dyslexia. However, the psychometric properties of the survey had been examined in multiple studies. Prior to using this instrument, I obtained written permission from the developer.

Soriano-Ferrer and Echegaray-Bengoa (2014) followed a 4-step process to create and validate the Knowledge and Beliefs about Developmental Dyslexia scale. First, they completed a review of the literature to identify a preliminary pool of items. Next, the authors engaged a panel of experts to review the items and revised the scale based on recommendations from the panel. Then, the expert panel grouped items into three subscales based on the intent of the instrument to measure knowledge and beliefs about dyslexia in three areas. Finally, Soriano-Ferrer and Echegaray-Bengoa conducted a pilot study with 89 classroom teachers to assess the scale and remove ineffective items. The reliability for the entire scale was .76 using Cronbach's alpha and ranged from .64 to .69 for the three subscales.

Along with a third researcher, the authors of the Knowledge and Beliefs about Developmental Dyslexia scale conducted two additional studies using this instrument with similar results. First, they examined the knowledge and beliefs of 513 Spanish-speaking preservice and in-service teachers in Peru and Spain (Soriano-Ferrer, Echegaray-Bengoa, & Joshi, 2016). Cronbach's alpha was found to be .84 for the total

scale (.77 for the general information subscale, .73 for the symptoms and diagnosis subscale, and .68 for the treatment subscale). The following year, the researchers examined the knowledge, misconceptions, and knowledge gaps of preservice and in-service teachers in Peru (Echegaray-Bengoa, Soriano-Ferrer, & Joshi, 2017). The reliability of the Knowledge and Beliefs about Developmental Dyslexia scale, using Cronbach's alpha was found to be .81 for the total scale and between .67 and .75 for the subscales.

Implicit theory of intelligence survey. Dweck's (2000) implicit theory of intelligence survey includes three statements to which participants indicated their level of agreement. These three statements were used to collect data in this study. Educational researchers including Gutshall (2014) have used the implicit theory of intelligence survey to measure both teachers' and students' theories about the nature of intelligence and ability. Prior to using this survey, I obtained written permission from the developer to use the three implicit theory of intelligence statements.

Dweck, Chiu, and Hong (1995) presented data from six studies that examined the reliability and validity of the implicit theory of intelligence survey. The internal reliability of the survey was high in all of the studies and ranged between 0.94 and 0.98. The test-retest reliability over a 2-week interval was 0.80. Factor analysis conducted by Dweck et al. indicated that implicit theory of intelligence as measured by the 3-item measure was independent of other human attributes as well as sex, age, political affiliation, and religion. When evaluating the discriminant validity, the authors found the

implicit theory of intelligence was unrelated to a variety of cognitive, emotional, and social measures (Dweck et al., 1995).

Reading Teacher Beliefs and Instructional Intentions survey. I developed the Reading Teacher Beliefs and Instructional Intentions (RTBII) survey to collect data on the beliefs and intention variables. The final survey included a total of 21 items in four subscales: behavioral beliefs (four items), normative beliefs (three items), control beliefs (four items), and instructional intentions (10 items).

During the development of the RTBII survey, I submitted the preliminary items to be used for measurement of the variables to an expert panel for review. Experts in both content and survey construction used the Validation Rubric for Expert Panel (White & Simon, n.d.) to provide feedback on the face validity, construct validity, and content validity of the RTBII survey. I calculated Cronbach's alpha to determine how well items in the survey correlated with each other and provide evidence of reliability. The results and implications of the pilot study are discussed in Chapter 4.

Operationalization of Constructs

Teacher knowledge. I measured two teacher knowledge constructs in the study: knowledge of basic language concepts and knowledge of reading disabilities. Knowledge – language was operationalized as the total number of items correct out of 37 on the Teacher Knowledge Survey of Basic Language Constructs. The items on the Teacher Knowledge Survey of Basic Language Constructs were presented in a multiple-choice format. A sample item on this survey was "Identify the pair of words that begins with the same sound: a) *joke-goat*, b) *chef-shoe*, c) *quiet-giant*, d) *chip-chemist*, e) *no idea*."

Knowledge – reading disabilities was operationalized as the total number of items correct out of 36 on the Knowledge and Beliefs about Developmental Dyslexia scale. The response options on the Knowledge and Beliefs about Developmental Dyslexia scale (*true*, *false*, or *I don't know*) allowed me to distinguish items a participant believed incorrectly from those he or she did not know. One item on this scale was "Reversing letters and words is the main characteristic of dyslexia."

Teacher beliefs. I measured teachers' mind-set beliefs with the implicit theory of intelligence items. The items included three statements to which participants indicated their agreement using a 7-point scale from 1 (*strongly agree*) to 7 (*strongly disagree*). To determine a beliefs – mind-set score, I calculated a mean score for the three items. Scores at or below 3.0 indicated an entity theory of intelligence whereas scores at or above 4.0 indicated an incremental theory of intelligence. Dweck et al. (1995) recommended removing from analysis those participants who do not have a clear theory of intelligence (those with scores higher than 3.0 but lower than 4.0), which typically amounts to approximately 15% of the population. One of the items was "Students have a certain amount of intelligence and they really can't do much to change it."

I used the Reading Teacher Beliefs and Instructional Intentions survey to collect data on teachers' behavioral beliefs, normative beliefs, and control beliefs. In the instructions, I explicitly defined the general behavior and listed five evidence-based strategies for reading instruction. Participants were asked to read and respond to a brief statement related to the instructional strategies. The normative and control beliefs subscales were judged on a 7-point scale (1 = *strongly disagree* and 7 = *strongly agree*).

One example of an item used to measure control beliefs was “The decision to provide evidence-based instructional practices for reading is beyond my control”. I calculated a mean score for each subscale. To measure behavioral beliefs, I provided a sentence stem followed by a pair of antonyms. Participants indicated their answer on a 7-point continuum. For example, “My use of evidence-based instructional practices for reading is: (1 = *worthless* and 7 = *useful*).” When analyzing the data, I recoded the items that had a negative endpoint on the right so that higher numbers always represented a positive response and calculated a mean score for the behavioral beliefs subscale.

Intention to provide evidence-based reading instruction. Huang (2006) suggested that researchers define a behavior of interest in terms of action, target, context, and time. I defined the behavior of interest for the present study as: providing evidence-based reading instruction in the primary classroom throughout the school year. To begin to operationalize the construct of intention to provide evidence-based reading instruction, I reviewed two seminal reports related to reading instruction in the United States: *Preventing Reading Difficulties in Young Children* and the *Report of the National Reading Panel* (Duke & Block, 2012). From these reports, I generated a comprehensive list of evidence-based strategies for reading instruction.

Implementing evidence-based reading instruction is a broad behavior. To make this construct manageable, I selected five research-based instructional strategies to include in the construct of evidence-based reading instruction. The set of strategies represented each of the five categories of reading instruction, and researchers

recommended that each of the strategies is used daily (Snow et al., 1998). The strategies were:

- provide explicit instruction in or practice manipulating phonemes using letters of the alphabet;
- provide multiple opportunities to apply knowledge of letters and sounds to read words, sentences, and stories;
- model fluent reading by reading aloud;
- provide explicit instruction on unfamiliar or important vocabulary before reading a particular text; and
- provide explicit instruction in or practice applying specific text comprehension strategies.

I administered the Reading Teacher Beliefs and Instructional Intentions survey to measure intention to provide evidence-based reading instruction. In accordance with the Intention Simulation method (see Francis et al., 2004), I provided a brief scenario describing a hypothetical student followed by items designed to measure the number and frequency of intended use of each of the five evidence-based strategies for reading instruction with the hypothetical student. For each of the five instructional strategies, participants indicated the number of times per week they would use the strategy (0 = *never* and 5 = *daily*). I calculated a composite score for the behavioral intention subscale by calculating the sum of the scores on the five items. I chose to use a composite score because it captured the number of strategies the participant intended to use and the frequency of use (see Stichter et al., 2009).

Data Analysis Plan

I used the Statistical Package for the Social Sciences (SPSS) software, Version 24.0, for data cleaning, screening, and analysis. Data cleaning and screening procedures were conducted to identify missing data and test the following assumptions relevant to multiple regression analysis: normality, univariate and multivariate outliers, linearity, homoscedasticity, and multicollinearity.

To assess accuracy, missing data, normality, and univariate outliers, I ran a frequency distribution. Determining the nature of the missing data, for instance, if it was random or follows a pattern, informed my approach to handling the missing data.

I addressed assumptions related to the level of measurement and sample size through the study design. Including two or more continuous or dichotomous independent variables and one continuous dependent variable met the level of measurement assumption. The desired sample size of 68 met Field's (see 2013) recommendation to select a sample size of at least 50 or 10 to 20 times as many participants as independent variables.

To address the remaining assumptions, I used both graphical and statistical methods. First, I checked univariate descriptive statistics (mean, standard deviation, skewness, and kurtosis) and examined histograms for residuals with a normal curve (see Kumar et al., 2015). Then, I conducted a visual examination of scatterplots and reviewed the correlational matrix. I computed Mahalanobis' Distance to determine if any multivariate outliers influenced the model. To test the assumption of multicollinearity, I

computed the correlational coefficients for each pair and examined the variance inflation factor (VIF) statistics. The results of these analyses are presented in Chapter 4.

Research question and hypotheses. The present study was designed to explore the following research question: What are the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction?

$H_0$1: There is not a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia scale, and teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_a1: There is a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia scale, and teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

$H_0$2: There is not a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia scale, and intention to provide

evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

H_a2: There is a predictive relationship between teacher knowledge, as measured by the Teacher Knowledge Survey of Basic Language Constructs and the Knowledge and Beliefs about Developmental Dyslexia scale, and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

$H_0 3$: There is not a predictive relationship between teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

$H_a 3$: There is a predictive relationship between teacher beliefs, as measured by the Implicit Theory of Intelligence survey and Reading Teacher Beliefs and Instructional Intentions survey and intention to provide evidence-based reading instruction, as assessed by the Reading Teacher Beliefs and Instructional Intentions survey.

Statistical tests. Multiple regression analysis was appropriate for this study for several reasons. Multiple regression analysis allowed for the recognition and representation of the complex relationships characteristic of phenomena examined in behavioral science research (see Creswell, 2014). Researchers who used the theory of planned behavior to provide a framework for their studies often used multiple regression analysis to identify significant predictors of behavioral intention or, in some cases, a

particular behavior (Francis et al., 2004). Frankfort-Nachmias and Nachmias (2008) suggested that multiple regression can be used to describe the extent of the relationships between the dependent variable and multiple independent variables. Furthermore, Field (2013) indicated multiple regression is appropriate when the dependent variable is continuous, and the independent variables are continuous, as is the case with teacher knowledge, or categorical, for instance, teachers' mind-set beliefs.

Rationale for including potential covariates. I identified four background factors as potentially relevant to this study. Most primary teachers are female (McFarland et al., 2018), and differences associated with gender were important to document. I included gender as a variable in this study. Some researchers have reported differences in mind-set beliefs as a function of age (Jones, Bryant, et al., 2012) so I asked participants to provide their age. I also collected data on participants' education (level and number and type of certifications) and experience (the number of years of teaching, grade levels taught, and educational settings).

Interpretation of results. After data cleaning, screening, and initial analysis, I used SPSS to run a standard multiple regression analysis to determine how well the model fit the data. I examined R_2 to determine how much variance was explained by the model compared to how much variance there was. To determine how much variability the model explained relative to how much it could not, I examined *F*. I also examined the *b*-value to determine the strength of the relationship between independent and dependent variables.

Threats to Validity

The external validity of a study represents the extent to which the results of a study can be generalized to the larger population (Rudestam & Newton, 2015). My decision to use a convenience sample limited the external validity of this study. Using an online platform to collect data further limited the external validity of the study because only that subset of primary teachers working in general education classrooms in the United States who had access to the Internet had the potential to be included. In light of these limitations, the results of this study were interpreted with caution and only in the context of the study.

Internal validity is concerned with the extent to which an identified relationship exists between dependent and independent variables. One threat to the internal validity of this study is that of experimental mortality. Researchers have consistently shown that teachers lack knowledge about basic language concepts and common reading disabilities (Soriano-Ferrer & Echegaray-Bengoa, 2014; Wadlington & Wadlington, 2005; Washburn et al., 2014; Washburn, Joshi, & Cantrell, 2011). Participants were likely to find the knowledge items difficult and exit before completing the survey. Differences between those participants who completed the survey and those who failed to do so could have influenced the results. To address this limitation, I designed the survey so that items expected to be more difficult, those related to morphology, for instance, were interspersed with items expected to be less difficult. I also attempted to prepare participants by explaining in the introduction to the study that they might find some items difficult to answer and that other teachers had a similar experience.

The number of independent variables could have threatened the internal validity of the study. Reading instruction is a complicated endeavor (Byrne et al., 2010), and teachers' instructional intentions may be influenced by factors beyond their knowledge and beliefs. Examining all of the factors that influenced teachers' intentions to provide evidence-based reading instruction was beyond the scope of this study, and I interpreted data and drew conclusions within the context of the study.

Ethical Procedures

Throughout the design and implementation of this study, I made decisions that minimized the potential for ethical issues. I work for a local education agency in a management position where I have access to primary teachers; however, to avoid issues related to conflict of interest and perceived coercion to participate, I chose to use an anonymous online survey instead of collecting data from participants at my work site. Using the SurveyMonkey platform prevented me from offering an incentive for participating in the study. Through SurveyMonkey, participants raised money for charities and earned chances to win sweepstakes prizes; additional incentives were not allowed. The likelihood that participants considered the incentives to be excessive, coercive, or otherwise unethical was greatly reduced. The population of interest selected for this study, primary teachers in general education classrooms in the United States, was not considered a vulnerable population. Due to the nature of teaching certifications, this population included adults who were not incarcerated, mentally disabled, or residents of any facility.

I also attempted to minimize the potential for ethical issues in the implementation of the study. Before recruiting participants or collecting data, I obtained approval from the Walden University Institutional Review Board (IRB). This approval (#10-12-17-0396412) indicated that the study complied with the university's ethical standards and that the potential benefits of participating in the study outweighed the risks. When developing the recruitment protocol, I established an informed consent process that met university guidelines and recommendations and ensured potential participants made an informed decision about participating in the study. I also obtained permission from the author or authors of all published instruments before their use.

Participant data are sensitive, and I maintained high ethical standards when making decisions related to the collection and storage of data. I disabled Internet provider (IP) address tracking within the SurveyMonkey platform so that participants remained anonymous. Allowing participants to remain anonymous eliminated the risk of unintended disclosure of confidential information and intrusion of privacy of the participant or the participant's family. I limited survey questions related to personal information to only those relevant to the study. In protecting confidential data, I ensured electronic data were and are password protected, stored for a minimum of five years, and destroyed when no longer needed or relevant.

Summary

In this chapter, I described the methodological components of this study. First, I identified characteristics of the study related to the variables under investigation and the research methodology. Next, I discussed the population of interest and how I engaged

participants from a sample of this population. I then described data collection, including the process I went through to conduct a pilot study of the Reading Teacher Beliefs and Instructional Intentions survey. In the next section, I articulated my plan for analyzing data. Finally, I identified threats to validity resulting from decisions I made when designing the study and explained how I maintained ethical standards when conducting the study. In Chapter 4, I will provide my explanation of the results of data collection and analysis.

Chapter 4: Results

Introduction

The purpose of this study was to examine the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based instruction for reading. I investigated these relationships to shed light on the factors that influence teachers' intended strategies for reading instruction that are evidence-based, and thus considered effective. This study was guided by the following research question: What are the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction?

In the current chapter, I describe the findings and implications of the pilot study. Then, I describe data collection and report demographic characteristics of the sample. I conclude by reporting descriptive statistics, the results of my evaluation of statistical assumptions, and statistical analyses findings.

Pilot Study

Of primary interest in the current study was being able to assess the relationships among various categories of beliefs and instructional intentions. A scale to fit this end could not be found in the literature, so I created one to measure the combination of teacher beliefs and intentions examined in this study. Because this was a novel measure, before data collection, I conducted a pilot study.

The initial Reading Teacher Beliefs and Instructional Intentions (RTBII) survey was developed and validated in accordance with the guidelines provided by Ajzen (2006) and Francis et al. (2004). The pilot study included measurement of reliability and

validity, examination of problems with content or procedures, and revisions to improve the effectiveness of the RTBII survey. An expert panel review and administration of the survey to a small sample of the target population generated meaningful and usable data. Evaluation of these data resulted in a revision to the survey and recruitment procedure.

Data Collection

I completed data collection for the pilot study in two phases. During the first phase, I recruited over 200 professors from Walden University and local colleges and universities with expertise in survey construction or literacy to serve on the expert panel. Three individuals agreed to provide feedback on the original version of the RTBII. During the second phase, I used the SurveyMonkey platform to recruit primary teachers to respond to the survey and provide feedback on the questions and instructions. Both qualitative and quantitative data were collected during each phase.

Expert panel review. The expert panel used the Survey/Interview Validation Rubric for Expert Panel (White & Simon, n.d.) to evaluate face validity, construct validity, and content validity of the RTBII. Feedback indicated that the survey seemed to be a reasonable approach to collecting the desired data (face validity) and appeared to align with the operational definitions of the constructs being measured (construct validity). The expert panel also agreed that the survey measured the necessary facets of instructional intentions related to reading instruction, behavioral beliefs, normative beliefs, and control beliefs (content validity). Additional feedback resulted in revisions to the wording of two questions to increase clarity, correct a typo, and modify the instructions to clarify the information sought and how to complete the questions.

Administration to small sample. The RTBII survey was made available through the SurveyMonkey platform for 18 weeks during the fall of 2017. I used the SurveyMonkey Audience feature to recruit participants for an online survey. A total of 77 invitations to participate in the survey were e-mailed to potential participants. Twelve completed the survey for a response rate of 15.6%.

After failing to collect the desired number of completed responses using the SurveyMonkey Audience feature, I expanded the recruitment strategy to include the use of Market Data Retrieval (MDR) to recruit participants. As a nationwide marketing company, MDR maintains an extensive database of teachers in the United States, the target population for this study. MDR e-mailed invitations to 1,937 K-3 public school teachers in the United States, and 13 additional participants completed the survey. The response rate of 1.2% indicated alternative recruitment strategies were needed for the main study.

Results of the Pilot Study

Data cleaning and screening. Prior to analysis, I conducted a visual review of the data and checked descriptive statistics to confirm that data were entered and scaled appropriately. Demographic and descriptive statistics are reported in Table 2. Means were within the range of possible values, and visual inspection of histograms indicated normality of response distribution for all survey items.

Table 2

Pilot Study: Demographic and Descriptive Statistics for Participants

	Frequency (%)	Mean (*SD*)	Range
Age		50 (11.33)	28-76
Experience			
Total years teaching		14 (9.63)	1-32
Less than 3 years	2 (8%)		
3 – 9 years	7 (28%)		
10 – 20 years	9 (36%)		
More than 20 years	7 (28%)		
Gender			
Male	2 (8%)		
Female	23 (92%)		
Education – highest degree completed			
Bachelor	9 (36%)		
Master	11 (44%)		
Doctorate	5 (20%)		
Experience – school type			
Public	24 (96%)		
Private	1 (4%)		
Experience – school setting			
Urban	9 (36%)		
Suburban	11 (44%)		
Rural	5 (20%)		

To identify potential problem questions, I examined nonresponse rates. Only one data point was missing. Therefore, no questions were identified as problematic, and all were retained on the final version of the RTBII survey.

Review of tracking information collected by SurveyMonkey indicated the estimated time to complete (20 minutes) was longer than the actual time to complete, with participants taking an average of just under 9 minutes to complete the survey. In

contrast, the length of time needed to collect a sufficient number of responses was underestimated and resulted in a change in procedure for the pilot study as well as the main study.

Statistical analysis. The data set for the RTBII survey did not meet the minimum sample size threshold for factor analysis (see Hinkin, Tracey, & Enz, 1997) or principal components analysis (see Rodriguez, Topp, & Fehring, 2014). Instead, I computed an internal consistency estimate of reliability for the RTBII survey and subscales of the RTBII using coefficient alpha and item-total correlations.

The value for the coefficient alpha of the RTBII was .74, an acceptable level for surveys based on the theory of planned behavior (Francis et al., 2004). The beliefs – behavioral and beliefs - normative subscales of the RTBII had reliabilities over .80, Cronbach's $\alpha = .89$ and $\alpha = .85$, respectively, whereas the intention and beliefs - control subscales had reliabilities of $\alpha = .61$ and $\alpha = .60$. There are divergent opinions about an acceptable alpha level for theory of planned behavior surveys. Francis et al. (2004) set the acceptable Cronbach's alpha at 0.6, and Barati, Allahverdipour, Hidarnia, Niknami, and Bashirian (2015) considered an alpha above 0.50 to be acceptable. Using these parameters, all reliabilities were considered acceptable.

Inspection of the item-total correlations for items within each subscale revealed values equal to or greater than 0.30, the threshold indicated acceptable by Lee, Carvallo, and Lee (2015). Therefore, the RTBII and each of its subscales demonstrated acceptable reliability. These findings indicated the scale scores for the RTBII were reasonably reliable for participants like those in the study.

In addition to the RTBII questions, I included four questions related to the clarity of the questions, the clarity of the instructions, and any difficulty answering questions or understanding what kind of answers were expected. All participants indicated the questions and instructions were clear. Five participants offered qualitative data that were reviewed and integrated into the main study. For instance, the item addressing information about school setting was revised to allow multiple answers, and the item addressing grade levels taught was expanded to include transitional kindergarten teachers.

Impact of the Pilot Study

The results of the pilot study had an impact on the RTBII survey and the recruitment strategy for the main study. Based on feedback from pilot study participants, I revised the RTBII to include an additional measure of intention. I used the lessons I learned during participant recruitment to modify my recruitment strategy for the main study.

Instrumentation. I included a single measure of intention in the original version of the RTBII: A brief scenario describing a hypothetical student who demonstrated the classic warning signs of dyslexia was followed by items designed to measure the number and frequency of intended use of each of the five evidence-based strategies for reading instruction with this student. Qualitative feedback from pilot study participants indicated they would likely use different strategies with differing frequencies when working with beginning readers versus struggling readers. In response, I revised the RTBII to include an additional measure of intention to provide evidence-based reading instruction. This

measure presented a second scenario describing a typical beginning reader. The format and response choices remained consistent with the original scenario describing a student demonstrating the classic warning signs of dyslexia. The addition of a second scenario allowed me to measure overall intention and to compare intention related to two distinct groups of students: beginning readers (those within the first 2 years of formal reading instruction) and struggling readers.

Participant recruitment. Another impact of the pilot study was a change to the recruitment strategy. The use of SurveyMonkey Audience did not result in an adequate number of completed surveys. This feature could only identify and recruit potential participants at the level of educator, which included professors, lecturers, teachers, and trainers. Because the population for this study was narrower than educator, many participants were screened out, and the desired number of responses from primary teachers was not obtained. Even after expanding the initial recruitment strategy to include the MDR, it was difficult and time-consuming to obtain enough completed survey responses to finish the pilot study. I implemented two alternative recruitment strategies for the main study.

The first involved the use of public websites to identify potential participants. A review of public websites for schools, school districts, county offices of education, colleges, and universities located in Northern California revealed e-mail addresses for primary teachers or teacher educators. I sent an invitation e-mail with IRB-approved text (including the Internet link and an opt-out message) to teachers and teacher educators identified through the website search. Approximately one week after the initial e-mail, I

sent a follow-up e-mail to all of those who did not opt out. The second alternative recruitment strategy was to post the survey on the Walden University participant pool.

After the pilot study was complete and changes were made and approved, I moved into data collection for the main study. In the next section, I detail the data collection phase including the time frame, recruitment strategy, and response rates as well as the process I used for data cleaning and screening.

Data Collection

Data collection followed the plan presented in Chapter 3. I used three published instruments and one researcher-created instrument to measure the independent and dependent variables and obtain demographic information. To measure teacher knowledge, I administered the Teacher Knowledge Survey of Basic Language Concepts (Binks-Cantrell, Joshi, & Washburn, 2012) and the Knowledge and Beliefs about Developmental Dyslexia scale (Soriano-Ferrer & Echegaray-Bengoa, 2014). I measured teachers' implicit theory of intelligence using the Implicit Theory of Intelligence survey created by Dweck (2000). Lastly, demographic information, teachers' behavioral, normative, and control beliefs, and teachers' intention to provide evidence-based reading instruction were measured using the Reading Teacher Beliefs and Instructional Intentions survey.

Time Frame, Recruitment, and Response Rates

The survey for this study was available on the SurveyMonkey website for approximately nine weeks during April through June 2018. Because the primary recruitment strategy involved the use of work e-mail addresses, data collection ended the

week after the last schools in the area closed for summer. The survey was posted on the Walden University participant pool website for approximately five weeks during May and June 2018. No responses were collected through the participant pool.

During the recruitment period, I sent invitations to 2,626 transitional kindergarten (tk) through 3rd grade teachers in two counties in Northern California using e-mail addresses available on public school district websites. Approximately one week after the initial invitation, I sent a reminder to all teachers who did not ask to be removed (2614 reminders). A total of 75 teachers followed the link to the survey on SurveyMonkey and indicated they gave their informed consent to participate. The response rate of 2.9% for the main study was higher than that of the pilot study.

Data Cleaning, Screening, and Computing

After participants indicated their informed consent to participate, I asked a series of screening questions to ensure participants met inclusion criteria. Sixteen participants were screened out because they did not teach tk-3 (n = 9), did not teach in general education (n = 2) or indicated that they participated in the pilot study of the RTBII (n = 5). Twenty participants chose to leave the survey before answering all questions, and two additional participants were dropped from analysis because they failed to answer more than 15% of items. I included 37 completed responses my analyses. The a priori power analysis indicated a desired sample size of 68 to see an effect, thus the sample size used for analyses was a limitation of this study.

Demographic and descriptive statistics for the study sample are reported for age (n = 36), experience – total years teaching (n = 37), gender (n = 37), education – highest

degree completed (n = 37), experience – school type (n = 37), and experience – school setting (n = 37) in Table 3. Gender was excluded from further analysis because all survey participants identified as female.

Table 3

Main Study: Demographic and Descriptive Statistics for Participants

	Frequency (%)	Mean (*SD*)	Range
Age		46.94 (9.18)	26-70
Experience			
Total years teaching		15.19 (8.82)	2-33
Less than 3 years	1 (3%)		
3 – 9 years	9 (25%)		
10 – 20 years	17 (47%)		
More than 20 years	9 (25%)		
Gender			
Male	0 (0%)		
Female	37 (100%)		
Education – highest degree completed			
Bachelor	20 (54%)		
Master	17 (46%)		
Experience – school type[a]			
Public	36		
Private	3		
Charter	3		
Magnet	4		
Experience – school setting[a]			
Urban	15		
Suburban	22		
Rural	9		

[a] Percentages are not reported because some participants marked multiple items

Three notable differences were apparent when comparing the study sample to the population of elementary teachers in the United States. First, all participants who completed the survey indicated their gender to be female. In the United States, 11% of

elementary school teachers are male (McFarland et al., 2018). Second, approximately 46% of study participants held a postbaccalaureate degree, which is less than the United States average of 55% (McFarland et al., 2018). Third, a lower percentage of the study sample, 3%, were within the first two years of teaching elementary school when compared to the United States average of 10% (McFarland et al., 2018). The study sample also had a higher percentage of teachers with more than ten years of teaching experience than the general population of teachers (McFarland et al., 2018).

The study sample was not representative of the population because the sample had a greater number of female teachers with more teaching experience and lower postbaccalaureate degree attainment than the United States average for primary teachers. Lack of representativeness taken with the small sample size limits the generalizability of the results of this study. The results described in the next section should be interpreted with caution and only within the context of this sample.

Results

Descriptive Statistics

In Table 4, I present descriptive statistics for the study variables: intention to provide evidence-based reading instruction, teacher knowledge, and teacher beliefs. Then, I present descriptive statistics separately for intention related to beginning readers in Table 5 and intention related to struggling readers in Table 6. The scores for intention to provide evidence-based reading instruction (intention – overall) represented a composite score that included the number of strategies out of five the participant reported using and the reported average frequency of use during a 5-day school week with

beginning readers (intention - beginning) and with struggling readers (intention - struggling). For the knowledge variables, I determined the sum of total number of items correct out of 37 on the Teacher Knowledge Survey of Basic Language Concepts (knowledge – language) and out of 36 on the Knowledge and Beliefs about Developmental Dyslexia scale (knowledge – reading disabilities). I calculated a mean score for each of the belief variables (beliefs - behavioral, beliefs - normative, beliefs - control, and beliefs - mind-set).

Table 4

Main Study: Means, Standard Deviations, and Correlations Among Independent Variables and Intention (Overall)

	1	2	3	4	5	6	7
Intention – overall		.279	.461	.396	-.145	.204	.075
Knowledge – language			.084	.248	-.279	.046	.082
Knowledge – reading disabilities				.216	.053	.192	.191
Beliefs – behavioral					.015	.426	.259
Beliefs – normative						.042	.135
Beliefs – control							-.103
Beliefs – mind-set							
Mean	42.05	26.54	20.65	6.49	5.59	5.57	5.47
Standard deviation	5.60	4.34	6.83	0.67	0.90	1.02	1.50
Maximum	50	37	36	7	7	7	7
Minimum	0	0	0	0	0	0	0
Range	31.00-50.00	15.00-34.00	8.00-34.00	5.00-7.00	3.67-7.00	3.00-7.00	2.00-7.00

Table 5

Main Study: Means, Standard Deviations, and Correlations Among Independent Variables and Intention (Beginning Readers)

	1	2	3	4	5	6	7
Intention – beginning		.206	.350	.584	-.095	.340	.126
Knowledge – language			.084	.248	-.279	.046	.082
Knowledge – reading disabilities				.216	.053	.192	.191
Beliefs – behavioral					.015	.426	.259
Beliefs – normative						.042	.135
Beliefs – control							-.103
Beliefs – mind-set							
Mean	21.57	26.54	20.65	6.49	5.59	5.57	5.47
Standard deviation	2.91	4.34	6.83	0.67	0.90	1.02	1.50
Maximum	25	37	36	7	7	7	7
Minimum	0	0	0	0	0	0	0
Range	13.00-25.00	15.00-34.00	8.00-34.00	5.00-7.00	3.67-7.00	3.00-7.00	2.00-7.00

Table 6

Main Study: Means, Standard Deviations, and Correlations Among Independent Variables and Intention (Struggling Readers)

	1	2	3	4	5	6	7
Intention – struggling		.263	.426	.140	-.145	.041	.015
Knowledge – language			.084	.248	-.279	.046	.082
Knowledge – reading disabilities				.216	.053	.192	.191
Beliefs – behavioral					.015	.426	.259
Beliefs – normative						.042	.135
Beliefs – control							-.103
Beliefs – mind-set							
Mean	20.49	26.54	20.65	6.49	5.59	5.57	5.47
Standard deviation	3.66	4.34	6.83	0.67	0.90	1.02	1.50
Maximum	25	37	36	7	7	7	7
Minimum	0	0	0	0	0	0	0
Range	12.00-25.00	15.00-34.00	8.00-34.00	5.00-7.00	3.67-7.00	3.00-7.00	2.00-7.00

Statistical Assumptions

Prior to analysis, I examined the knowledge variables (language and reading disabilities) and beliefs variables (behavioral, normative, control, and mind-set) for accuracy of data entry, missing values, and fit between the distributions and the assumptions of multiple regression analysis. I tested the following assumptions: normality, univariate and multivariate outliers, linearity, homoscedasticity, and multicollinearity.

I ran a frequency distribution to check for accuracy of data entry, missing data, normality, and univariate outliers. The minimum and maximum values, means, and standard deviations of each of the variables were within reasonable limits. There were no missing values for any of the variables.

Normality. I assessed the normality of the variables through both graphical and statistical methods. Visual examination of histograms for each variable revealed approximately normal distributions. I examined the values and standard error of skewness and kurtosis to determine if either differed significantly from what would be expected in a normal distribution (see Table 7, for skewness and kurtosis statistics). Due to the small sample size, I used a conventional, but conservative alpha level, $\alpha = .01$, to evaluate the significance of the skew and kurtosis. In a normal distribution, both skew and kurtosis values are zero (Tabachnik & Fidell, 2012). All values were close to zero, and none were greater than twice the standard error, signifying reasonably normal distribution (see Miles & Shevlin, 2001).

Table 7

Main Study: Skewness and Kurtosis of Regression Variables

Variable	Skewness	Skewness *SE*	Kurtosis	Kurtosis *SE*
Intention – overall	-.124	.388	-.805	.759
Intention – beginning	-.773	.388	.570	.759
Intention – struggling	-.424	.388	-.575	.759
Knowledge – language	-.496	.388	.051	.759
Knowledge – reading disabilities	-.081	.388	-.935	.759
Beliefs – behavioral	-1.174	.388	.021	.759
Beliefs – normative	.012	.388	-.762	.759
Beliefs – control	-.292	.388	-.351	.759
Beliefs – mind-set	-.697	.388	-.627	.759
Age	.082	.393	.402	.768
Total years teaching	.351	.393	.768	.768

Univariate outliers. Visual examination of histograms did not reveal extreme scores for any variables. To further confirm the absence of univariate outliers, I

calculated *z* scores for each of the variables. The absolute values of the *z* scores were broadly consistent with those expected in a normal distribution. The majority fell in the normal range, about 5% were greater than 1.96, 1% was greater than 2.58, and none were greater than 3.29 (see Field, 2007). These statistical results indicated an absence of univariate outliers.

Linearity and homoscedasticity. Two important assumptions of regression analysis are that variables have a linear relationship (linearity) and have a similar amount of variance across the range of values (homoscedasticity). To test these assumptions, I performed a visual examination of bivariate scatterplots. As suggested by Tabachnik and Fidell (2012), I used the variables with the most discrepant distributions, beliefs – behavioral and knowledge – reading disabilities to produce a bivariate scatterplot. The oval shape of the plot supported my initial conclusion that the variables were normally distributed and suggested that they are both linearly related and homoscedastic, thus meeting these assumptions for multiple regression analysis (see Tabachnik & Fidell, 2012).

Multivariate outliers. To identify potential multivariate outliers that could have influenced the model, I computed Mahalanobis distance. Using critical χ^2 value = 22.46, $p = .001$, and $df = 6$ as parameters (see Tabachnik & Fidell, 2012), none of the values for the independent variables exceeded the critical χ^2 value, which suggested an absence of multivariate outliers in the distribution.

Multicollinearity. To check for multicollinearity, I computed the correlational coefficient (*R*) between each pair of independent variables (see Robinson, 2011). My

examination revealed all correlations to be less than .90, which indicated a lack of multicollinearity. The highest correlation among independent variables, between beliefs - behavioral and beliefs - control, was .43 (see Tables 3 and 4). I also examined the variance inflation factor (VIF) statistics. The largest VIF, beliefs – behavioral (1.47) was well below 10, and the average VIF (1.24) was not substantially above 1, providing additional support for the conclusion that there is no collinearity within the data (see Field, 2013).

Statistical Analyses

To answer the research question, I examined the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction. Then, in response to feedback provided by participants during the pilot study, I conducted additional statistical analyses to examine the relationships among teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction with two groups of students: beginning readers and struggling readers. I present the results of my analysis below.

Predicting intention to provide evidence-based reading instruction. I conducted standard multiple regression analysis to evaluate how well the teacher knowledge and teacher belief measures predicted intention to provide evidence-based reading instruction. The two teacher knowledge variables were teacher knowledge of basic language concepts (knowledge - language) and teacher knowledge of reading disabilities (knowledge – reading disabilities). The four teacher belief variables included three constructs from the theory of planned behavior: behavioral beliefs (beliefs -

behavioral), normative beliefs (beliefs - normative), control beliefs (beliefs - control), and one from the implicit theory of intelligence: mind-set beliefs (beliefs - mind-set). The dependent variable was intention to provide evidence-based reading instruction (intention - overall).

The unstandardized regression coefficients and intercept, the semi-partial correlations, R^2, and adjusted R^2 are displayed in Table 8. The linear combination of independent variables was significantly related to intention, F (6, 30) = 2.754, $p < .05$, with R^2 at .36 and 95% confidence limits from -1.72 to 41.87. The adjusted R^2 value of .23 indicated that approximately 23% of the variance of intention to provide evidence-based reading instruction was predicted by the independent variables: teacher knowledge of basic language concepts, teacher knowledge of reading disabilities, teacher behavioral beliefs, teacher normative beliefs, teacher control beliefs, and teacher mind-set beliefs. Overall, the regression model significantly improved the ability to predict intention to provide evidence-based reading instruction over the use of the mean value of intention would. However, a review of the coefficients of the regression model indicated none of the variables, when taken individually, made a significant contribution to predicting intention to provide evidence-based reading instruction

Table 8

Summary of Standard Multiple Regression Analysis for Variables Predicting Intention to Provide Evidence-Based Reading Instruction

	B [95% CI]	*SE B*	B	*t*	Sig	Semi-partial correlations
Constant	20.08 [-1.72, 41.87]	10.67		1.88	.07	
Knowledge – language	.19 [-.23, .61]	.21	.15	.91	.37	.16
Knowledge – reading disabilities	.33 [.08, .59]	.13	.41	2.65	.30	.44
Beliefs – behavioral	2.50 [-.54, 5.54]	1.49	.30	1.68	.10	.29
Beliefs – normative	-.75 [-2.73, 1.23]	.97	-.12	-.77	.45	-.14
Beliefs – control	-.06 [-1.97, 1.84]	.93	-.01	-.07	.95	-.01
Beliefs – mind-set	-.29 [-1.51, .94]	.60	-.08	-.48	.64	-.09
R^2	.36					
Adjusted R^2	.23					
F for change in R^2	2.75					

Note. N = 37. CI = confidence interval.

Predicting intention to provide evidence-based reading instruction with beginning readers. I conducted standard multiple regression analysis to evaluate how well the teacher knowledge and teacher belief measures predicted intention to provide evidence-based reading instruction with beginning readers. The independent variables were knowledge of basic language concepts (knowledge - language), knowledge of reading disabilities (knowledge – reading disabilities), behavioral beliefs (beliefs - behavioral), normative beliefs (beliefs - normative), control beliefs (beliefs - control), and mind-set beliefs (beliefs - mind-set). The dependent variable was intention to provide evidence-based reading instruction with beginning readers (intention - beginning).

The unstandardized regression coefficients and intercept, the semi-partial correlations, R^2, and adjusted R^2 are displayed in Table 9. The linear combination of

independent variables was significantly related to intention, F (6, 30) = 3.542, $p < .001$, with R^2 at .41 and 95% confidence limits from 5.05 to 16.55. The adjusted R^2 value of .30 indicates that approximately 30% of the variance of intention to provide evidence-based reading instruction with beginning readers was predicted by teacher knowledge of basic language concepts, teacher knowledge of reading disabilities, teacher behavioral beliefs, teacher normative beliefs, teacher control beliefs, and teacher mind-set beliefs.

As indicated in Table 9, when considered individually, only beliefs – behavioral was a significant predictor of intention to provide evidence-based instruction with beginning readers. Knowledge - language, knowledge - reading disabilities, beliefs - normative, beliefs - control, and beliefs - mind-set did not significantly predict intention to provide evidence-based instruction with beginning readers. Teachers with more positive beliefs about providing evidence-based reading instruction were significantly more likely to indicate they intended to use these strategies than teachers with less positive beliefs.

Table 9

Summary of Standard Multiple Regression Analysis for Variables Predicting Intention to Provide Evidence-Based Reading Instruction With Beginning Readers

	B [95% CI]	*SE B*	β	*t*	Sig	Semi-partial correlations
Constant	5.75 [-5.05, 16.55]	5.23		1.09	.29	
Knowledge – language	.02 [-.19, .23]	.10	.03	.21	.84	.04
Knowledge – reading disabilities	.10 [-.03, .23]	.06	.23	1.60	.12	.28
Beliefs – behavioral	2.17 [.67, 3.68]	.74	.50	2.95	.01*	.47
Beliefs – normative	-.34 [-1.32, .64]	.48	-.11	-.72	.48	-.13
Beliefs – control	.23 [-.71, 1.18]	.46	.08	.51	.62	.09
Beliefs – mind-set	-.05 [-.66, .55]	.30	-.03	-.18	.86	-.03
R^2	.41					
Adjusted R^2	.30					
F for change in R^2	3.54					

Note. N = 37. CI = confidence interval.
*p < .01

Predicting intention to provide evidence-based reading instruction with struggling readers. I repeated the standard multiple regression analysis with intention to provide evidence-based reading instruction with struggling readers (intention - struggling) as the dependent variable. The independent variables were knowledge of basic language concepts (knowledge - language), knowledge of reading disabilities (knowledge – reading disabilities), behavioral beliefs (beliefs - behavioral), normative beliefs (beliefs - normative), control beliefs (beliefs - control), and mind-set beliefs (beliefs - mind-set).

The unstandardized regression coefficients and intercept, the semi-partial correlations, R^2, and adjusted R^2 are displayed in Table 10. The linear combination of independent variables was not significantly related to intention, F (6, 30) = 1.709, p =

.153, with R^2 at .25 and 95% confidence limits from -1.00 to 29.67. The adjusted R^2 value of .11 indicated that approximately 11% of the variance of intention to provide evidence-based reading instruction with struggling readers was predicted by knowledge – language, knowledge – reading disabilities, beliefs – behavioral, beliefs – normative, beliefs – control, and beliefs – mind-set.

When considered individually, only knowledge – reading disabilities was a significant predictor of intention to provide evidence-based instruction with struggling readers (see Table 10). Knowledge – language, beliefs – behavioral, beliefs – normative, beliefs – control, and beliefs – mind-set did not significantly predict intention to provide evidence-based instruction with struggling readers. Teachers with stronger knowledge of reading disabilities were significantly more likely to indicate intention to provide evidence-based reading instruction with struggling readers than teachers with less knowledge.

Table 10

Summary of Standard Multiple Regression Analysis for Variables Predicting Intention to Provide Evidence-Based Reading Instruction With Struggling Readers

	B [95% CI]	*SE B*	β	*t*	Sig	Semi-partial correlations
Constant	14.33 [-1.00, 29.67]	7.51		1.91	.07	
Knowledge – language	.16 [-.13, .46]	.14	.20	1.15	.26	.20
Knowledge – reading disabilities	.23 [.05, .41]	.09	.44	2.64	.01*	.43
Beliefs – behavioral	.32 [-1.81, 2.46]	1.05	.06	.31	.76	.06
Beliefs – normative	-.40 [-1.79, .99]	.68	-.10	-.59	.56	-.11
Beliefs – control	-.30 [-1.64, 1.04]	.66	-.08	-.45	.65	-.08
Beliefs – mind-set	-.23 [-1.10, .63]	.42	-.09	-.55	.57	-.10
R^2	.25					
Adjusted R^2	.11					
F for change in R^2	1.71					

Note. N = 37. CI = confidence interval.
*p < .01

Summary and Conclusions

In this chapter, I presented the findings and implications of a pilot study. I also described data collection efforts and reported demographic characteristics of the sample. I concluded the chapter by reporting descriptive statistics, the results of my evaluation of statistical assumptions, and the findings of my statistical analyses.

The results of the multiple regression analysis indicated different patterns for different dependent variables. When examining overall intention, none of the variables were significant predictors. However, when I considered intention related to different categories of students, some of the variables did achieve significance as predictors of intention. Beliefs – behavioral was a significant predictor of intention to provide evidence-based reading instruction with beginning readers and knowledge – reading

disabilities was a significant predictor of intention to provide evidence-based reading instruction with struggling readers.

In Chapter 5, I offer my interpretation of these results and describe the limitations of the study. I also make recommendations for future research and describe the implications of the study for positive social change.

Chapter 5: Discussion, Recommendations, and Conclusion

Introduction

The purpose of this study was to examine the relationships among teacher knowledge, teacher beliefs, and teacher intention related to evidence-based reading instruction. I used a cross-sectional, correlational survey design to examine the relationships between teacher intention to provide evidence-based reading instruction, the dependent variable, and teacher knowledge and teacher beliefs, the independent variables. The study was conducted in an attempt to shed light on factors that may influence teachers' instructional intentions. Increased understanding of these relationships has the potential to inform the adoption of new policies and practices related to teacher selection processes, preparation programs, and professional development offerings. Improving selection and preparation processes may result in teachers who are better equipped to provide initial reading instruction and respond to students who struggle with reading.

The results presented in Chapter 4 indicated different patterns depending on how I looked at the dependent variable. In my initial analysis, none of the variables were significant predictors of intention to provide evidence-based reading instruction. When examining intention specific to instruction with beginning readers, I found the only significant predictor was behavioral beliefs. For intention specific to instruction for struggling readers, I found that knowledge about reading disabilities was the only significant predictor.

In this chapter, I offer my interpretation of the results of the multiple regression analysis situated within the context of the extant literature and the conceptual framework for this study. I then discuss the limitations that arose during the execution of the study regarding generalizability and validity. Next, I present my recommendations for further research. I conclude by suggesting areas of potential positive social change as well as other implications and recommendations for practice.

Interpretation of Findings

In answering the research question, I examined multiple relationships among teacher knowledge, teacher beliefs, and teacher intention related to evidence-based reading instruction. The first hypothesis considered teacher knowledge and teacher beliefs as predictors of intention to provide evidence-based reading instruction. The second hypothesis considered the relationship between teacher knowledge and intention to provide evidence-based reading instruction, and the third considered the relationship between teacher beliefs and intention to provide evidence-based reading instruction. The results indicated that none of the variables were significant predictors of intention to provide evidence-based instruction, thus failing to reject the null hypotheses.

In response to participant feedback on pilot study questions that indicated teachers would likely use different strategies with differing frequencies for beginning readers versus struggling readers, I conducted additional analysis of the data to examine intention related to these two groups of students. The results indicated only one independent variable (beliefs – behavioral) achieved significance in predicting intention to provide evidence-based reading instruction with beginning readers. A different variable

(knowledge – reading disabilities) was a significant predictor of intention with struggling readers. Despite these findings, the study provided additional support for the current understanding of the variables of interest, particularly knowledge of basic language concepts, knowledge of reading disabilities, and intention to provide evidence-based reading instruction.

Findings in Comparison to Peer-Reviewed Literature

Teacher knowledge. Two aspects of teacher knowledge were measured in the present study: knowledge of basic language concepts and knowledge of reading disabilities. Basic language concepts are those that must be mastered to achieve proficiency in reading and include phonological awareness, phonemic awareness, decoding, alphabetic principle, and morphological awareness (Washburn, Joshi, & Cantrell, 2011). Knowledge of reading disabilities encompasses an understanding of the characteristics, causes, diagnoses, and intervention strategies. Each of these aspects of teacher knowledge will be addressed in the following sections.

Basic language concepts. Since at least 1994, researchers have documented teachers' lack of knowledge of basic language concepts (Cunningham et al., 2009; Lyon & Weiser, 2009; Washburn, Joshi, & Cantrell, 2011). The present study extended these findings to a small sample of primary teachers working in Northern California. Teachers in the present study correctly answered an average of only about 72% of questions about basic language concepts.

Solid understanding of basic language concepts, including the structure of language and the relationships between different components, allows teachers to provide

more effective instruction in all areas of reading (McCutchen, Harry, et al., 2002; Washburn, Mulcahy, et al., 2016). Podhajski et al. (2009) identified the following benefits to having comprehensive knowledge of basic language concepts:

- improved ability to organize and sequence the content of reading lessons and units;
- increased effectiveness in using students' errors as a source of information about misconceptions or gaps in understanding;
- enhanced ability to select the words that best represent a particular sound-symbol relationship; and
- expanded skill in explaining why a particular word is spelled the way it is.

Researchers have applied the principle of the Peter effect to various aspects of reading. Based on a biblical story describing an interaction between Peter and a beggar, the Peter effect suggests someone cannot give something they do not have. Applegate and Applegate (2004) examined teacher enjoyment of reading and found students whose teachers did not enjoy reading were less likely to enjoy reading whereas students with teachers who enjoyed reading were more likely to enjoy reading. More recently, Binks-Cantrell, Washburn, et al. (2012) applied the Peter effect to their study of teacher educators' knowledge of basic language concepts and found similar patterns of performance on a survey of basic language constructs between the teacher educators and the preservice teachers enrolled in their courses.

On the items measuring teacher knowledge of basic language concepts, over half of the participants achieved what would be considered a passing score (70%) on a test.

According to the Peter effect, the teachers who do not have a strong understanding of basic language concepts would not have this knowledge to pass on to their students. It stands to reason that increasing teacher knowledge could lead to increases in student knowledge.

Researchers have documented the effectiveness of teacher-level interventions in increasing student performance in reading. Using a mixed-methods approach, McCutchen, Abbott, et al. (2002) found that increases in teachers' knowledge contributed to changes in instruction that led to improved student learning. Likewise, Podhajski et al. (2009) found increases in teachers' knowledge of explicit reading instruction contributed to increases in students' performance in reading. The findings of the present study provided additional support for the need to improve the effectiveness of teacher preparation programs and professional development offerings related to reading, particularly in the area of basic language concepts. Teachers must learn from instructors who have solid and explicit understanding of basic language concepts if they are to have this knowledge to pass on to their students.

Reading disabilities. Similar to the findings related to teacher knowledge of basic language concepts, deficits in knowledge of reading disabilities have been documented consistently since the early 2000s (Furnham, 2013; Soriano-Ferrer & Echegaray-Bengoa, 2014; Wadlington & Wadlington, 2005; Washburn et al., 2014; Washburn, Joshi, & Cantrell, 2011). The results of this study indicated teachers answered an average of only 57% of questions about reading disabilities correctly, and only 7 out of 37 answered 70% or more items correctly.

This finding was important because most students with reading disabilities, such as dyslexia, remain in general education classrooms. General education teachers are the first line of defense in preventing reading failure, but they must recognize when a student is struggling and respond appropriately. Teachers who possess a solid and accurate understanding of reading disabilities have the potential to provide evidence-based instruction that can alleviate reading failure because they can recognize warning signs and respond early and effectively.

The results of this study also indicated that teachers who knew more about reading disabilities had a stronger intention to provide evidence-based reading instruction with struggling readers. However, the three teachers who correctly answered the most items related to reading disabilities answered between 80% and 92% of the questions correctly. This finding indicated that additional opportunities to develop an understanding of reading disabilities, including the causes, symptoms, diagnoses, and treatment, are warranted.

Teacher beliefs. Four categories of teacher beliefs were included as independent variables in the present study: behavioral beliefs, normative beliefs, control beliefs, and mind-set beliefs. The first three are included in the theory of planned behavior; the fourth represents the implicit theory of intelligence. Although I examined teacher beliefs within a specific discipline and explicit framework, as suggested by Leko et al. (2014), only behavioral beliefs achieved significance as a predictor of intention to provide evidence-based reading instruction with beginning readers. Teachers who had more positive opinions about the consequences of providing evidence-based instruction to beginning

readers were more likely to indicate they intended to do so. None of the four categories of beliefs were significant predictors of intention to provide evidence-based reading instruction with struggling readers. Regarding teacher knowledge, the diverse findings of this study aligned with empirical evidence characterized by inconsistent findings related to significant predictors.

One possible explanation for these findings is that the range of the mean score for different categories of participants' beliefs was much smaller for behavioral beliefs than for normative beliefs, control beliefs, and mind-set beliefs. In addition, the mean score for behavioral beliefs was approximately 1 point higher than for the mean score of the three other categories of beliefs. Less diversity and a higher overall score on teachers' beliefs about the consequences of using evidence-based strategies for reading instruction may have contributed to the significance of this variable, as suggested by Moats (2009b). Furthermore, Cunningham et al. (2009) cautioned against using a Likert-type scale to measure teacher beliefs at opposite ends of a spectrum because this practice could result in inaccurate or misleading data.

Intention to provide evidence-based reading instruction. Five evidence-based strategies for reading instruction were included in this study: phonemic awareness (provide explicit instruction in or practice manipulating phonemes using letters of the alphabet); phonics (provide multiple opportunities to apply knowledge of letters and sounds to read words, sentences, and stories); fluency (model fluent reading by reading aloud to students); vocabulary (provide explicit instruction on unfamiliar or important vocabulary prior to reading a specific text); and comprehension (provide explicit

instruction or practice applying specific text comprehension strategies). These strategies were selected because they represented each of the five areas of reading instruction. Furthermore, researchers recommend daily use of each strategy with beginning or struggling readers (Snow et al., 1998).

In the present study, teachers' self-reports indicated that, on average, teachers intended to use most of the five strategies most days of an average week with beginning and struggling readers. Intention was slightly higher for beginning readers than for struggling readers. If intention is an immediate antecedent of behavior, as suggested by Ajzen's (2002) theory of planned behavior, these findings provided additional evidence that instruction in the classroom does not reflect recommendations from current research, national reports, or United States policy (see Cunningham et al., 2009; Kuzborska, 2011; Seidenberg, 2013). Research addressing relationships among teacher-related factors, teachers' intention to provide evidence-based instruction for beginning and struggling readers, and teachers' classroom reading instruction may contribute to better understanding of the characteristics effective teachers have in common.

Findings in the Context of the Conceptual Framework

The variables under investigation (teacher knowledge, teacher beliefs, and intention to provide evidence-based reading instruction) were examined using a conceptual framework that integrated the implicit theory of intelligence as a fourth category of beliefs in the theory of planned behavior. In response to the recommendation of Ajzen (1991) and Salleh and Laxman (2015), an additional category of beliefs, implicit theory of intelligence or mind-set beliefs, was included in the present study. The

inclusion of the fourth category of beliefs did not increase the ability of the theory of planned behavior to predict intention. Mind-set beliefs did not significantly predict intention to provide evidence-based reading instruction with beginning or struggling readers.

The findings of the present study were consistent with those from other studies in that there were inconsistent results for three categories of beliefs included in the theory of planned behavior. In four studies using the theory of planned behavior to examine predictors of teachers' intention to use technology (Demir, 2010; Lee et al., 2010; Sadaf et al., 2012; Teo & Lee, 2010), none of the categories of beliefs achieved significance in all studies. Researchers using the theory of planned behavior to conceptualize their examination of physical education teachers' attitudes, behaviors, and beliefs related to students with disabilities also found inconsistencies among significant predictors in the theory of planned behavior model (Casebolt & Hodge, 2010; Hodge et al., 2009; Jeong & Block, 2011; Richardson et al., 2012). Inconsistency in the significance of the three predictors was also found in two studies that addressed teachers' attitudes and behaviors toward students with behavioral and learning difficulties (Elik et al., 2010; MacFarlane & Woolfson, 2013).

Researchers including MacFarlane and Woolfson (2013) questioned the direct transfer of the theory of planned behavior from health to education settings and suggested a need to include additional teacher-, child-, or environment-related variables. In the present study, however, expanding the theory of planned behavior to include the implicit theory of intelligence as a fourth category of beliefs did not improve prediction of

instructional intention. Reading acquisition is a complicated process for teachers and students and a more comprehensive conceptual framework that integrates multiple theories about teaching and learning, and teachers and students may be needed to understand the role teachers play.

Limitations of the Study

Generalizability

Limitations created by the small sample size and skewed demographic characteristics decreased the generalizability of the results of the study. Both the pilot study and main study were limited by the small number of completed responses I collected. In the main study, all of the completed survey responses were provided by teachers who identified as female. In the United States, approximately 11% of primary teachers identify as male (McFarland et al., 2018), so the sample was not representative of the population.

Validity

The recruitment strategies I selected were threats to the external validity of the pilot study and the main study. I used SurveyMonkey Audience to recruit participants for the pilot study which limited participants to those who signed up to take surveys through that platform. I experienced difficulty collecting a minimum number of completed responses during the pilot study and modified the recruitment procedure for the main study. The recruitment procedure for the main study, collecting e-mail addresses from public websites, allowed for a representative sample in terms of many demographic

characteristics. Geographically, however, the sample was limited to teachers from two counties in Northern California.

Recommendations

I offer the following recommendations for future research: To address limitations related to generalizability, I suggest repeating the study with a larger sample size that is more representative of the population of primary teachers in the United States. A deficiency in teacher knowledge of basic language concepts is well documented and persistent (Soriano-Ferrer & Echegaray-Bengoa, 2014; Wadlington & Wadlington, 2005; Washburn et al., 2014; Washburn, Joshi, & Cantrell, 2011). I believe exploring this deficiency in terms of how teachers were taught to read may prove valuable.

Over the years, the method of teaching students how to reading has shifted. Many children have been taught to read using a phonics approach (Castles et al., 2018), but during the 1970s and 1980s, a whole language approach was the primary method used to teach students how to read (Schneider, 2016). The current workforce includes teachers who were taught how to read using both approaches to reading instruction. Examining differences in teacher knowledge and instruction between those who learned how to read during the whole language phase of reading instruction as opposed to a phonics phase may be beneficial. Future research could focus on answering questions such as: What are the differences between teachers taught to read using a whole language approach and teachers taught to read using a phonics approach? Or How does the approach with which teachers were taught to read influence how they teach others to read?

Implications

The results of this study indicated that the participants did not demonstrate strong knowledge of basic language concepts or reading disabilities. The study identified a relationship between greater knowledge of reading disabilities and intention to use more evidence-based reading instruction more frequently with struggling readers. Possible implications of this study included those related to positive social change at the societal/policy level, theoretical implications, and recommendations for practice.

Positive Social Change at the Societal/Policy Level

California lawmakers passed AB1369 in October 2015. This legislation required the development of program guidelines for students with disabilities to improve dyslexia identification, strategies for remediation, and educational services for students by the start of the 2017-2018 school year (Special Education: Dyslexia, 2015). The results of this study indicated that primary teachers in two counties in Northern California need an opportunity to increase their knowledge of reading disabilities including symptoms, diagnosis, and treatment if they are to successfully implement this legislation in their classrooms. Enacting policies and practices in school districts and teacher preparation programs to increase teacher knowledge of reading disabilities may affect social change by improving students' reading acquisition outcomes.

Theoretical Implications

In this study, including the implicit theory of intelligence as an additional belief in the theory of planned behavior model did not improve prediction of intention related to the use of evidence-based reading instruction for beginning or struggling readers.

However, the study provided additional evidence demonstrating the lack of transferability of the theory of planned behavior from the health field to the education field. Further research may lead to the identification of variables that increase the predictive power of the theory of planned behavior in education settings.

Recommendations for Practice

Effective instruction provided by knowledgeable teachers who believe all children can learn is key to successful reading acquisition outcomes (Snow et al., 1998). Teacher educators may use the findings of this study to refine the content of reading methodology courses to ensure future reading teachers develop a strong knowledge base related to basic language concepts and reading disabilities. School administrators planning professional development for in-service teachers may include training opportunities focused on increasing knowledge of basic language concepts and reading disabilities.

Conclusion

The quality of the education system in the United States cannot exceed the quality of its teachers (Barber & Morshed, 2007). One way to improve the quality of the system is to improve the effectiveness of teachers. To do so, teacher educators must ensure that all teachers develop the knowledge and skill needed to do their job effectively. Factors contributing to decreased teacher effectiveness that must be addressed include a lack of exposure to research-based reading instruction during teacher preparation programs, inadequate time for or interest in staying abreast of current research, and inability to modify the district-adopted reading curriculum (Al Otaiba et al., 2016; Stark et al., 2016).

Better understanding of these factors and other characteristics that influence teacher effectiveness may lead to better prepared teachers.

Primary teachers are in a unique position to reduce the widespread reading failure that has persisted in the United States for many years (Binks-Cantrell, Washburn, et al., 2012; Washburn, Binks-Cantrell, et al., 2016). However, to achieve this outcome, several changes to current practice and policy are necessary. First, primary teachers need to develop extensive content knowledge of what language is and how language works (McCutchen et al., 2009). Second, primary teachers need to provide reflective reading instruction (Banks et al., 2013) based on reliable empirical evidence of current best practices (Griffiths & Stuart, 2013). Third, primary teachers should differentiate instruction to meet individual needs and respond as soon as a student begins to struggle with any component of the reading process (Ness & Southall, 2010; Vernon-Feagans et al., 2010).

Studies such as this one increased collective understanding in a single aspect of teaching and learning. The findings of this study made a small contribution, but when added to the findings of other research, the results may contribute to positive social change for children learning to read in classrooms across the United States.

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Appendix A: Reading Teacher Beliefs and Instructional Intentions

You are invited to take part in a research study about how teachers' knowledge and beliefs influence their intentions related to reading instruction. I am inviting primary teachers in general education classrooms in the United States to be in the study. This form is part of a process called "informed consent" that gives you an opportunity to understand this study before deciding to participate. This study is being conducted by a researcher named Brandi Harrold, who is a doctoral student in educational psychology at Walden University. There are no known conflicts of interest for this researcher to disclose.

Background Information: The purpose of this study is to examine relationships among teacher-related factors (including knowledge and beliefs) and intention to use best practices for reading instruction.

Procedures: If you agree to be in this study, you will be asked questions about your knowledge, beliefs, and intentions related to reading instruction. Questions measure knowledge about basic language constructs and reading difficulties and beliefs about reading instruction. Additional questions ask about strategies you might use during reading instruction and how often you think you might use each strategy. There are 84 questions on the survey and most teachers take approximately 30 minutes to complete the survey.

Here are some sample questions:

Which of the following words has an open syllable?
(Six response options: wave, bacon, paddle, napkin, none of the above, no idea)

Students who have reading disabilities without an apparent cause are called dyslexic.
(Three Response options: True, False, Don't Know)

You can learn new things, but you can't really change your basic intelligence.
(Six response options from Strongly agree to Strongly disagree)

On average, how many days per week would you model fluent reading by reading out loud to your student(s)?
(Six response options: 0, 1, 2, 3, 4, 5)

Voluntary Nature of the Study: This study is voluntary. You are free to accept or turn down this invitation. No one will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study: Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as frustration from not knowing the answer to a question. Being in this study would not pose a risk to your safety or wellbeing.

If you would like to learn more about reading or reading disabilities including dyslexia, please contact the International Literacy Association at (800)336-7323 or visit their website at www.literacyworldwide.org or the International Dyslexia Association at info@dyslexiaida.org or www.dyslexiaida.org.

While there may be no direct benefit to you as a result of participating in this study, the results have the potential to inform efforts to help teachers provide effective reading instruction for all students.

Payment: No payment will be provided by the researcher for your participation.

Privacy: Reports coming out of this study will not share the identities of individual participants nor any details that might allow identification. I will not know who you are and will not use any personal information for any purpose outside of this research project. Survey data will be kept secure through password protection and data encryption and stored securely for a period of at least 5 years, as required by the university.

Contacts and Questions: You may ask any questions you have now, or if you have questions later, you may contact the researcher via email at [redacted]. If you want to talk privately about your rights as a participant, you can call the university's Research Participant Advocate at [redacted]. Walden University's approval number for this study is 10-12-17-0396412 and this approval expires on October 11, 2018.

Please print or save this consent form for your records.

1. After you have read the information above, which is printed in English (a language that you read and understand), and feel you understand the study well enough to make a decision, please indicate your informed consent by clicking on the appropriate button below.
   - ○ Yes, I agree to participate in this study.
   - ○ No, I do not agree to participate in this study

2. Have you taught full time for at least one year in a Kindergarten, 1st, 2nd, or 3rd grade classroom?
   - ○ Yes
   - ○ No

3. You indicated you have taught full time for at least one year in a Kindergarten, 1st, 2nd, or 3rd grade classroom. Did you teach in a general education or special education classroom?
   - ○ General education classroom
   - ○ Special education classroom
   - ○ Both general education and special education classroom(s)
   - ○ Other

4. You indicated you have taught full time for at least one year in a Kindergarten, 1st, 2nd, or 3rd grade classroom. Did you teach in the United States?
   - ○ Yes
   - ○ No

Imagine you are teaching beginning readers in a first-grade classroom.

5. On average, how many days per week would you use each of the following instructional strategies with your students?

	Average Number of Days					
Provide explicit instruction in or practice manipulating phonemes using letters of the alphabet	0	1	2	3	4	5
Provide multiple opportunities to apply knowledge of letters and sounds to read words, sentences, and stories.	0	1	2	3	4	5
Model fluent reading by reading aloud	0	1	2	3	4	5
Provide explicit instruction on unfamiliar or important vocabulary prior to reading a specific text	0	1	2	3	4	5
Provide explicit instruction or practice applying specific text comprehension strategies	0	1	2	3	4	5

Imagine that Casey, a student in your 2nd grade class, is having difficulty with reading. More specifically, Casey struggles with accurate and fluent word recognition, spelling, and decoding. The student also has difficulty completing phonological processing tasks such as producing rhyming words and blending sounds into words. For Casey, listening comprehension is much stronger than reading comprehension, and the reading difficulties are unexpected when you consider Casey's demonstrated knowledge and skill in other areas.

6. On average, how many days per week would you use each of the following instructional strategies with a student like Casey?

	Average Number of Days					
Provide explicit instruction in or practice manipulating phonemes using letters of the alphabet	0	1	2	3	4	5
Provide multiple opportunities to apply knowledge of letters and sounds to read words, sentences, and stories.	0	1	2	3	4	5
Model fluent reading by reading aloud	0	1	2	3	4	5
Provide explicit instruction on unfamiliar or important vocabulary prior to reading a specific text	0	1	2	3	4	5
Provide explicit instruction or practice applying specific text comprehension strategies	0	1	2	3	4	5

For the following 11 questions, the term *key instructional strategies for reading* includes all of the following five strategies:

- Provide explicit instruction in or practice manipulating phonemes using letters of the alphabet
- Provide multiple opportunities to apply knowledge of letters and sounds to read words, sentences, and stories.
- Model fluent reading by reading aloud
- Provide explicit instruction on unfamiliar or important vocabulary prior to reading a specific text
- Provide explicit instruction or practice applying specific text comprehension strategies

7. My using *key instructional strategies for reading* every day would be:

Good ○ ○ ○ ○ ○ ○ ○ Bad

8. My using *key instructional strategies for reading* every day would be:

Harmful ○ ○ ○ ○ ○ ○ ○ Beneficial

9. My using *key instructional strategies for reading* every day would be:

Worthless						Helpful
○	○	○	○	○	○	○

10. My using *key instructional strategies for reading* every day would be:

Pleasant for me						Unpleasant for me
○	○	○	○	○	○	○

11. Most people I work with (students, principal, parents) think that I____use *key instructional strategies for reading* every day.

should not						should
○	○	○	○	○	○	○

12. It is expected of me that I use *key instructional strategies for reading* every day.

Strongly disagree						Strongly agree
○	○	○	○	○	○	○

13. I feel pressure from those with whom I work (students, principal, parents) to use *key instructional strategies for reading* every day.

Strongly disagree						Strongly agree
○	○	○	○	○	○	○

14. I am confident I could use *key instructional strategies for reading* every day.

Strongly disagree						Strongly agree
○	○	○	○	○	○	○

15. For me, using *key instructional strategies for reading* every day is:

Difficult						Easy
○	○	○	○	○	○	○

16. The decision to use *key instructional strategies for reading* every day is beyond my control.

Strongly disagree						Strongly agree
○	○	○	○	○	○	○

17. Whether I use *key instructional strategies for reading* every day or not is entirely up to me.

Strongly disagree						Strongly agree
○	○	○	○	○	○	○

Appendix B: Permission to Use Knowledge and Skill of Basic Language Constructs Survey

From: Emily Cantrell <[redacted]>
Sent: Wednesday, June 14, 2017 11:55 AM
To: Brandi Harrold
Subject: Re: Request to Use Knowledge and Skill of Basic Language Constructs Survey in Dissertation Research

You are most welcome to use the survey, Brandi. Best of luck in your endeavors.

On Tue, Jun 6, 2017 at 11:39 PM, Brandi Harrold <[redacted]> wrote:

> Dear Ms. Binks-Cantrell:
>
> I am a doctoral student from Walden University writing my dissertation tentatively titled Primary Teachers' Knowledge and Beliefs as Predictors of Intention to Use Best Instructional Practices for Reading under the direction of my dissertation committee chair Dr. Rachel Moore.
>
> I would like your permission to use the survey you and your colleagues designed to assess knowledge and skill of basic language constructs in my research study. I would like to use your survey under the following conditions:
>
> - I will use this survey only for my research study and will not sell or use it with any compensation or curriculum development activities.
> - I will include an acknowledgement of the author and the source and would be happy to include specific wording if you have a preferred form of acknowledgement.
> - I will send a link to view my completed dissertation promptly to your attention.
>
> If these are acceptable terms and conditions, please indicate your permission by replying to this email.
>
> Sincerely,
>
> *Brandi Harrold*
> Ph.D. Candidate

Appendix C: Permission to Use Scale of Knowledge and Beliefs about Developmental Dyslexia

From: Manuel.Soriano[redacted]<[redacted]>
Sent: Wednesday, June 7, 2017 3:11 AM
To: Brandi Harrold
Subject: Re: Request to Use A Scale of Knowledge and Beliefs about Developmental Dyslexia for Dissertation Research

Of course, you con use it. I adjunt some papers with complete scale and scoring.
Best
Manuel

Dear Mr. Soriano-Ferrer:
I am a doctoral student from Walden University writing my dissertation tentatively titled Primary Teachers Knowledge and Beliefs as Predictors of Intention to Use Best Instructional Practices for Reading under the direction of my dissertation committee chair Dr. Rachel Moore.

I would like your permission to use the Scale of Knowledge and Beliefs about Developmental Dyslexia in my research study. I would like to use your scale under the following conditions:

- I will use this scale only for my research study and will not sell or use it with any compensation or curriculum development activities.
- I will include an acknowledgement of the author and the source and would be happy to include specific wording if you have a preferred form of acknowledgement.
- I will send a link to view my completed dissertation promptly to your attention.

If these are acceptable terms and conditions, please indicate your permission by replying to this email.

Sincerely,

Brandi Harrold
Ph.D. Candidate

Appendix D: Permission to Use 3-item Implicit Theories of Intelligence Scale

From: Carol Dweck <[redacted]>
Sent: Wednesday, July 19, 2017 9:46 AM
To: Brandi Harrold
Subject: Re: Requesting Permission to Use 3-item Implicit Theories of Intelligence Scale in Dissertation Research

Dear Brandi,

Thanks for following up. You certainly have my permission to use the scale--but I should tell you that the scale no longer seems to be a good predictor of teachers' intentions or behaviors. Since the growth mindset concept has become familiar to many teachers, their endorsements no longer seem to line up with their attitudes and behavior.

In any case, I wish you the best with your interesting dissertation!

Warm regards,
Carol Dweck

From: Brandi Harrold <[redacted]>
Sent: Wednesday, July 19, 2017 12:15 AM
To: Carol Dweck
Subject: Requesting Permission to Use 3-item Implicit Theories of Intelligence Scale in Dissertation Research

Dear Dr. Dweck:

I am a doctoral student from Walden University writing my dissertation tentatively titled Primary Teachers' Knowledge and Beliefs as Predictors of Intention to Use Best Instructional Practices for Reading under the direction of my dissertation committee chair Dr. Rachel Moore.

I sent an email last month seeking your permission to use the 3-item implicit theories of intelligence scale in my research study and I am contacting you again per university guidelines. I would like to use your scale under the following conditions:

- I will use this scale only for my research study and will not sell or use it with any compensation or curriculum development activities.
- I will include an acknowledgement of the author and the source and would be happy to include specific wording if you have a preferred form of acknowledgement.
- I will send a link to view my completed dissertation promptly to your attention.

If these are acceptable terms and conditions, please indicate your permission by replying to this email.

Sincerely,

Brandi Harrold
Ph.D. Candidate